

Intermediate Course

Study Material

(Modules 1 to 2)

PAPER 6A

Financial Management

**(Relevant for May, 2025 and
onward Examinations)**

MODULE – 1



BOARD OF STUDIES
THE INSTITUTE OF CHARTERED ACCOUNTANTS OF INDIA

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Edition	:	July, 2024
Committee/Department	:	Board of Studies
E-mail	:	bosnoida@icai.in
Website	:	www.icai.org
Price	:	₹ /- (For All Modules)
ISBN No.	:	978-81-19472-27-7
Published by	:	The Publication & CDS Directorate on behalf of The Institute of Chartered Accountants of India, ICAI Bhawan, Post Box No. 7100, Indraprastha Marg, New Delhi 110 002 (India)
Printed by	:	

BEFORE WE BEGIN....

In the changing dynamics of business environment the role of a Chartered Accountant (CA) is not only restricted to accounting and auditing but has also shifted towards strategic decision making and entrepreneurship. It has necessitated the Chartered Accountancy profession to re-position itself from traditional role of accountants to a global business solution provider. In the era of digitization, form of markets has evolved from brick and mortar to cloud based e-markets, emergence of new financial instruments and currencies opening the avenues of opportunities in the guise of challenges, role of CA has evolved immensely. The CA as a professional dealing with management of financial has to take up diversified role. The world of finance is evolving with each passing day, so to the scope of financial management. The Board of Studies (BoS) of The Institute of Chartered Accountants of India (ICAI) with a motto to provide quality education and training to the aspiring Chartered Accountants has been continuously reviewing and updating the study material and making relevant changes in it. In order to make the aspiring Chartered Accountants contemporaneous and ready to play a key role in the dynamic global business environment; the competence requirements are continuously reviewed to inculcate the requisite professional competence.

In order to sustain and grow their financial standing, organisations across the world essentially require managers who are competent in new domains of finance. One of the fundamental domains of finance, financial management deals with the functions relating to how much and which assets are to be acquired, how to raise capital to acquire the assets and what is to be done to maximize the shareholder's wealth. Financial management comprises the processes of planning and controlling subsystems of funds.

A study in financial management will help the students to understand the functions of financial managers, providing with an overview of broad issues and problems that financial managers face in various commercial domains of our economy. This subject introduces various concepts and theories relating to finance, which are fundamental to the methodologies and proficiencies offered as aids to understand, identify, and solve the problems of financial managers. Study of financial management will help the Chartered Accountancy students to develop an acumen, to grow competencies in financing decision, investment decision, dividend decision

and working capital management. This Study Material contains all relevant and contemporary topics like *P2P lending, Equity funding, Crowd funding, Start-up funding, Credit Granting* as detailed out in the syllabus.

Under the Revised Scheme of Education and Training, at the Intermediate Level, students are expected not only to acquire professional knowledge but also to develop the ability to apply the knowledge in real life business situations. The process of learning should also help the students in imbibing professional skills, i.e., the intellectual skills and communication skills, necessary for achieving the desired professional competence.

The entire syllabus of nine chapters have been grouped into two modules:

Module-1: Consisting of six chapters namely:

Chapter-1: Scope and Objectives of Financial Management

Chapter-2: Types of Financing

Chapter-3: Financial Analysis and Planning- Ratio Analysis

Chapter-4: Cost of Capital

Chapter-5: Financing Decisions- Capital Structure

Chapter-6: Financing Decisions- Leverages

Module-2: Consisting of three chapters namely:

Chapter-7: Investment Decisions

Chapter- 8: Dividend Decisions

Chapter- 9: Management of Working Capital

The content for each chapter at the Intermediate level has been structured in the following manner –

1. **Comprehensive Learning Outcomes:** Learning outcomes which you need to demonstrate after learning each topic have been detailed in the first page of each chapter. Demonstration of these learning outcomes would help you to achieve the desired level of technical competence.
2. **Chapter Overview:** As the name suggests, this chart/table would give a broad framework of the contents covered in the chapter.

3. **Introduction:** A brief introduction is given at the beginning of each chapter, which would help you get a feel of the topic.
4. **Content:** In each chapter, the topics have been covered following 'step by step' approach. The concepts are explained in student-friendly manner with the aid of examples/illustrations/diagrams/flow charts/pictorials as per requirement. These value additions would help you develop conceptual clarity and to get a good and quick grasp of the topic. Diagrams, Pictorials and Flow charts would help you understand the concepts in a better manner. Illustrations would help you understand the application of concepts/ provisions. More illustrations/ practical questions in Test Your Knowledge section have been added to enable a thorough practice of variety of questions.
5. **Illustration with Answers:** Illustrations and examples have been included in the Study Material systematically, after discussion on each topic, so that application of the concepts can be understood very clearly. This would also enable you to learn and sharpen your application skills and test your understanding. Illustrations and practical questions have been re-arranged in a systematic way appropriately as per the requirement of each chapter.
6. **Summary:** A summary of the chapter is given at the end to help you revise what you have learnt. It would especially help you to revise the chapter(s) quickly the day before the examination.
7. **Multiple Choice Questions (MCQs) :** In the New Scheme of Education and Training, assessment for 30 marks in each paper at the Intermediate and Final level would be by way of case scenario based MCQs. Questions in this segment would comprise of a case scenario followed by a few MCQs based on the case scenario. All case scenario based MCQs would be application oriented. There would be 4 options in each MCQ, out of which the student has to choose the correct option. In the subject of Financial Management, a student has to apply the Financial Management concepts learnt in solving the MCQs based on the case scenario. In order to hone the application and analytical skills of students, independent MCQs have been included in every chapter of this Study Material. Solving these MCQs will enhance your conceptual clarity and sharpen your analytical skills.
8. **Test Your Knowledge:** This comprises of Multiple-Choice Questions (MCQs), Theoretical Questions and Practical Problems with solutions which test the length and breadth of your understanding of the topic.

9. **Skill Specification Assessment:** An indicative Skill Specification Assessment Grid has been incorporated in the Study Material for better understanding of the students. An effort has been made to arrange the questions/illustrations/exercise accordingly.

In this Study Material, formats of Financial Statements (i.e., Balance Sheet, Income Statements etc.) and financial terms used are for illustrative purpose only. For appropriate format and applicability of various Standards, students are advised to refer the study material of appropriate subject(s). Further, the solutions/answers contained in the study material are based on certain assumptions, and other logical alternative assumption/ approach/ presentation may be possible. Every effort has been made to remove typing errors (if any)/ clerical errors (if any)/ missing content (if any)/ formatting errors (if any) to make Study Material error free, however, if inadvertently any error is present and found by readers they may send it to us immediately, so that it can be rectified at our end.

In case you need any further clarification/ guidance, you may send your queries through ICAI BoS App.

Happy Reading and Best Wishes!

SKILL SPECIFICATION ASSESSMENT GRID

Skill Level	Manner of Assessment of Skills	Illustrative verbs used to construct learning outcomes
Level-I: Knowledge and Comprehension	Understanding or grasping ability (Defining, stating, enlisting, identifying, and explaining concepts / provisions/theories/principles relating to the relevant subject area.)	List – Preparing a list of. State – Mentioning clearly or fully the details of. Define – Explaining the exact meaning of. Describe – Giving detailed narration of something or key features. Distinguish – Mentioning or highlighting the difference between. Explain – Making the meaning of. Identify – Recognizing something. Illustrate – Explaining something with the help of an example. Combination of verbs: Comprehend and Explain; Identify and explain and similar verbs.

<p>Level-II:</p> <p>Application and Analysis</p>	<p>Applying and analyzing the concepts learned during the grasping level.</p> <p>(Application: Applying concepts / provisions / theories / principles in problem solving in non-complex scenarios.)</p>	<p>Application:</p> <p>Apply – Putting theoretical knowledge for practical purpose.</p> <p>Calculate – Arriving at some value by following numerical/ analytical procedures.</p> <p>Compute – Arriving at some value by following numerical/ analytical procedures.</p> <p>Determine – Ascertain or establish exactly by calculation or workings.</p> <p>Find/ Find out- Ascertain or establish exactly by calculation or workings.</p> <p>Demonstrate – Proving something with certainty using practical means.</p> <p>Prepare – Making something ready for any use.</p> <p>Reconcile – Making or proving consistency/ compatibility.</p> <p>Solve – Find an answer or solution to something.</p> <p>Tabulate – Exhibiting the required information in a tabular form.</p> <p>Combination of verbs:</p> <p>Compare and contrast similar verbs.</p>
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	<p>(Analysis: Applying, comparing and analysing concepts / provisions / theories / principles in problem) solving in moderately complex scenarios.)</p>	<p>Analysis:</p> <p>Analyze – Examining something in detail.</p> <p>Categorize – Arranging something in a predefined group or class or division.</p> <p>Compare – Examining the differences or similarities between.</p> <p>Construct – Building or compiling.</p> <p>Discuss – Writing about or examining in detail.</p> <p>Interpret – Translating in intelligible or familiar or understandable terms.</p> <p>Combination of verbs:</p> <p>Analyse and apply similar verbs.</p>
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SYLLABUS

PAPER – 6 : FINANCIAL MANAGEMENT AND STRATEGIC MANAGEMENT

(One paper – Three hours – 100 Marks)

SECTION A : FINANCIAL MANAGEMENT (MARKS: 50)

Objective:

- (a) To develop an understanding of various aspects of Financial Management and acquire the ability to apply such knowledge in decision-making.
- (b) To understand various finance functions like financing decision, investment decision, dividend decision.
- (c) To develop an understanding of working capital management and its component.

1. Financial Management and Financial Analysis

(i) Introduction to Financial Management Function

- (a) Objective and scope of financial management.
- (b) Profit Maximisation, Wealth Maximisation and Value Creation.
- (c) Role of Financial Manager and Financial Controller.
- (d) Financial management environment.
- (e) Functions of finance executives in an organization.
- (f) Financial distress and insolvency.

(ii) Financial Analysis through Ratios

- (a) Users of the financial analysis
- (b) Sources of financial data for analysis
- (c) Calculation and Interpretation of ratios.
- (d) Limitations of ratio analysis

2. Financing Decisions and Cost of Capital

(i) Sources of Finance

- (a) Different Sources of Finance, Characteristics of different types of long-term debt and equity finance, Method of raising long term finance
- (b) Different Sources of short-term Finance
- (c) Contemporary sources of funding- P2P lending, Equity funding, Crowd funding, Start-up funding, etc.
- (d) Internal fund as a source of finance
- (e) International sources of finance
- (f) Other sources of finance- Lease Financing, Sale and lease back, Convertible debt, Venture capital, Grants etc.

(ii) Cost of Capital

- (a) Significance of cost of capital
- (b) Factors of cost of capital
- (c) Measurement of costs of individual components of capital
- (d) Weighted average cost of capital (WACC)
- (e) Marginal cost of capital

(iii) Capital Structure Decisions

- (a) Significance of capital structure
- (b) Determinants of capital structure
- (c) Capital structure planning and designing
- (d) Designing of optimum capital structure
- (e) Theories of Capital Structure and value of the firm- relevancy and Irrelevancy of capital structure.
- (f) EBIT- EPS Analysis, Breakeven- EBIT Analysis.
- (g) Under/ Over Capitalisation.

(iv) Leverages

- (a) Types of Leverages- Operating, Financial and Combined
- (b) Analysis of leverages

3. Capital Investment and Dividend Decisions**(i) Capital Investment Decisions**

- (a) Objective of capital investment decisions
- (b) Methods of Investment appraisal:
 - Payback period, Discounted payback period
 - Accounting Rate of Return (ARR),
 - Net Present Value (NPV) - The meaning of NPV, Strengths and limitations of NPV method, The working capital adjustment in an NPV analysis, Capital rationing, Equivalent Annual Costs,
 - Internal Rate of return (IRR)- Limitations of the IRR method, Multiple IRRs,
 - Modified Internal Rate of Return (MIRR)- Definition and explanation of MIRR, Process for calculating MIRR, Strengths of the MIRR approach.
 - Profitability Index

(ii) Dividend Decisions

- (a) Basics of Dividends
- (b) Cash dividend, stock dividend/ bonus share, stock-splits, share buy back
- (c) Determinants of dividend
- (d) Relevancy and Irrelevancy of Dividend Policies- Traditional Approach, Walter's model, Gordon's model, Modigliani and Miller (MM) Hypothesis.

4. Management of Working Capital

- (a) The management of working capital- Liquidity and Profitability
- (b) The Working capital financing decisions- Primary and Secondary Sources of Liquidity
- (c) The working Capital Cycle (operating Cycle), Effectiveness of Working Capital based on its operating and cash conversion cycles
- (d) Assessment of working capital requirement
- (e) Management of Accounts Receivables (Debtors)
- (f) Factoring and Forfaiting
- (g) Credit Management
 - Credit granting
 - Monitoring accounts receivables
 - Debt collection
- (h) Management of Accounts Payables (Creditors)
- (i) Management of Cash, Treasury management
- (j) Banking norms of working capital finance

CONTENTS

MODULE – 1

Chapter-1: Scope and Objectives of Financial Management

Chapter-2: Types of Financing

Chapter-3: Financial Analysis and Planning-Ratio Analysis

Chapter-4: Cost of Capital

Chapter-5: Financing Decisions-Capital Structure

Chapter-6: Financing Decisions-Leverages

MODULE - 2

Chapter-7: Investment Decisions

Chapter-8: Dividend Decisions

Chapter-9: Management of Working Capital

DETAILED CONTENTS: MODULE – 1

CHAPTER 1 : SCOPE AND OBJECTIVES OF FINANCIAL MANAGEMENT 1.1-1.29

Learning Outcomes	1.1
Chapter Overview	1.2
1. Introduction	1.2
2. Meaning of Financial Management	1.3
2.1 Procurement of Funds	1.4
2.2 Effective Utilisation of Funds	1.7
3. Evolution of Financial Management	1.7
4. Finance Functions/ Finance Decision	1.8
5. Importance of Financial Management	1.10
6. Scope of Financial Management	1.11
7. Objectives of Financial Management	1.12
7.1 Profit Maximisation	1.13
7.2 Wealth Maximisation/ Value creation	1.14
8. Conflicts in Profit versus Value Maximization Principle	1.16
9. Role of Finance Executive	1.18
9.1 Role of Finance Executive in today's World vis-a-vis in the past	1.20
10. Financial Distress and Insolvency	1.21
11. Relationship of Financial Management with Related Disciplines	1.21
11.1 Financial Management and Accounting	1.21
11.2 Financial Management and Other Related Disciplines	1.23

12. Agency Problem and Agency Cost.....	1.24
Summary	1.25
Test Your Knowledge.....	1.26
Multiple Choice Questions (MCQs).....	1.26
Theoretical Questions.....	1.28
Answers to the MCQs.....	1.29
Answers to the Theoretical Questions	1.29

CHAPTER 2 : TYPES OF FINANCING2.1-2.46

Learning Outcomes	2.1
Chapter Overview	2.2
1. Financial Needs and Sources of Finance of a Business	2.2
2. Classification of Financial Sources.....	2.3
2.1 Sources of Finance based on Basic Sources.....	2.4
2.2 Sources of Finance based on Maturity of Payment	2.4
2.3 Sources of Finance based on Ownership and Control	2.5
3. Long-term Sources of Finance	2.5
3.1 Owners Capital or Equity Capital	2.5
3.2 Preference Share Capital	2.7
3.3 Retained Earnings.....	2.10
3.4 Debentures.....	2.10
3.5 Bond	2.13
3.6 Loans from Financial Institutions	2.16
3.7 Loans from Commercial Banks	2.17
4. Venture Capital Financing.....	2.18
4.1 Meaning of Venture Capital Financing.....	2.18
4.2 Characteristics of Venture Capital Financing.....	2.18

4.3	Methods of Venture Capital Financing.....	2.19
5.	Debt Securitisation	2.19
6.	Lease Financing.....	2.20
6.1	Types of Lease Contracts.....	2.21
6.2	Other Types of Leases	2.23
7.	Short-term Sources of Finance.....	2.24
8.	Other Sources of Financing.....	2.32
9.	International Financing.....	2.35
10.	Contemporary Sources of Funding	2.41
	Summary	2.42
	Test Your Knowledge.....	2.43
	Multiple Choice Questions (MCQs).....	2.43
	Theoretical Questions.....	2.46
	Answers to the MCQs	2.46
	Answers to the Theoretical Questions	2.46

CHAPTER 3 : FINANCIAL ANALYSIS AND PLANNING – RATIO ANALYSIS

3.1-3.99

	Learning Outcomes	3.1
	Chapter Overview	3.2
1.	Introduction	3.2
2.	Ratio and Ratio Analysis	3.3
2.1	Definition of Ratio	3.3
2.2	Ratio Analysis.....	3.3
2.3	Sources of Financial Data for Analysis.....	3.4
3.	Types of Ratios.....	3.4
3.1	Liquidity Ratios.....	3.5

3.2	Long-term Solvency Ratios/ Leverage Ratios.....	3.8
3.2.1	Capital Structure Ratios.....	3.9
3.2.2	Coverage Ratios	3.11
3.3	Activity Ratios/ Efficiency Ratios/ Performance Ratios/ Turnover Ratios	3.13
3.4	Profitability Ratios	3.18
3.4.1	Profitability Ratios based on Sales.....	3.20
3.4.2	Profitability Ratios related to Overall Return on Assets/ Investments	3.22
3.4.3	Profitability Ratios Required for Analysis from Owner's Point of View	3.27
3.4.4	Profitability Ratios related to market/valuation/Investors	3.28
4.	Users and Objective of Financial Analysis: A Bird's Eye View	3.30
5.	Application of Ratio Analysis in Financial Decision Making.....	3.33
5.1	Financial Ratios for Evaluating Performance	3.34
6.	Limitations of Financial Ratios.....	3.36
7.	Financial Analysis	3.37
8.	Summary of Ratios.....	3.38
	Summary	3.60
	Test Your Knowledge.....	3.62
	Multiple Choice Questions (MCQs).....	3.62
	Theoretical Questions.....	3.66
	Practical Problems	3.66
	Case Scenarios.....	3.72
	Answers to the MCQs.....	3.75
	Answers to the Theoretical Questions	3.76
	Answers to the Practical Problems.....	3.76
	Answers to the Case Scenarios	3.97

CHAPTER 4 : COST OF CAPITAL4.1-4.60

Learning Outcomes	4.1
Chapter Overview	4.1
1. Introduction	4.2
2. Meaning of Cost of Capital	4.2
3. Significance of Cost of Capital	4.2
4. Determination of Cost of Capital.....	4.3
5. Cost of Long-Term Debt (K_D)	4.4
5.1 Features of Debentures or Bonds	4.5
5.2 Cost of Irredeemable Debentures.....	4.6
5.3 Cost of Redeemable Debentures (using approximation method) ..	4.8
5.3.1 Cost of Debt using Present value method [Yield to maturity (YTM) approach].....	4.10
5.3.2 Amortisation of Bond	4.13
5.4 Cost of Convertible Debentures	4.14
6. Cost of Preference Share Capital (K_P)	4.16
6.1 Cost of Irredeemable Preference Shares.....	4.16
6.2 Cost of Redeemable Preference Shares	4.18
7. Cost of Equity Share Capital (K_E).....	4.19
7.1 Dividend Price Approach.....	4.20
7.2 Earnings Price Approach.....	4.20
7.3 Growth Approach or Gordon's Model	4.21
7.4 Realized Yield Approach.....	4.24
7.5 Capital Asset Pricing Model (CAPM) Approach	4.25
8. Cost of Retained Earnings(K_r)	4.28

9.	Weighted Average Cost of Capital (WACC)	4.31
9.1	Choice of Weights	4.33
10.	Marginal Cost of Capital	4.38
	Summary	4.42
	Test Your Knowledge	4.43
	Multiple Choice Questions (MCQs)	4.43
	Theoretical Questions	4.45
	Practical Questions	4.45
	Case Scenarios	4.49
	Answers to the MCQs	4.51
	Answers to the Theoretical Questions	4.51
	Answers to the Practical Problems	4.52
	Answers to the Case Scenarios	4.60

CHAPTER 5 : FINANCING DECISIONS- CAPITAL STRUCTURE5.1-5.76

	Learning Outcomes	5.1
	Chapter Overview	5.2
1.	Meaning of Capital Structure	5.2
2.	Capital Structure Theories	5.5
2.1	Net Income (NI) Approach	5.6
2.2	Traditional Approach	5.8
2.3	Net Operating Income (NOI) Approach	5.11
2.4	Modigliani-Miller (MM) Approach	5.15
2.5	The Trade-off Theory	5.27
2.6	Pecking Order Theory	5.29
3.	Factors Determining Capital Structure	5.30
3.1	Choice of source of funds	5.30

3.2	Factors affecting capital structure	5.30
4.	Optimal Capital Structure	5.32
5.	EBIT-EPS-MPS Analysis	5.33
5.1	Relationship between EBIT-EPS-MPS	5.33
5.2	Financial Break-Even Point (BEP) and Indifference Point Analysis.....	5.36
6.	Over-Capitalisation and Under-Capitalisation	5.45
6.1	Over-Capitalisation	5.45
6.2	Under-Capitalisation.....	5.46
6.3	Over-Capitalisation vis-à-vis Under-Capitalisation.....	5.47
	Summary	5.47
	Test Your Knowledge.....	5.48
	Multiple Choice Questions (MCQs)	5.48
	Theoretical Questions.....	5.51
	Practical Problems	5.52
	Case Scenarios.....	5.57
	Answers to the MCQs.....	5.59
	Answers to the Theoretical Questions	5.59
	Answers to the Practical Problems.....	5.59
	Answers to the Case Scenarios	5.75

CHAPTER 6 : FINANCING DECISIONS - LEVERAGES6.1-6.56

	Learning Outcomes	6.1
	Chapter Overview	6.2
1.	Introduction.....	6.2
2.	Meaning and Types of Leverages	6.3
2.1	Meaning of Leverage.....	6.3
2.2	Types of Leverage.....	6.3

2.3	Chart showing Degree of Operating Leverage, Financial Leverage and Combined Leverage.....	6.4
3.	Operating Leverage.....	6.5
3.1	Degree of Operating Leverage (DOL)	6.5
3.2	Break-Even Analysis and Operating Leverage.....	6.6
3.3	Margin of Safety (MOS) and Operating Leverage (OL).....	6.8
4.	Financial Leverage.....	6.14
4.1	Degree of Financial Leverage (DFL).....	6.14
4.2	Financial Leverage as 'Trading on Equity'	6.17
4.3	Financial Leverage as a 'Double edged Sword'	6.18
5.	Combined Leverage.....	6.19
5.1	Degree of Combined Leverage (DCL)	6.20
5.2	Analysis of Combined Leverage	6.20
	Summary	6.27
	Test Your Knowledge.....	6.27
	Multiple Choice Questions (MCQs).....	6.27
	Theoretical Questions.....	6.31
	Practical Problems	6.32
	Case Scenarios.....	6.38
	Answers to the MCQs	6.40
	Answers to the Theoretical Questions	6.40
	Answers to the Practical Problems.....	6.40
	Answers to the Case Scenarios	6.54

APPENDIX

Financial Tables	A.1-A.8
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SCOPE AND OBJECTIVES OF FINANCIAL MANAGEMENT

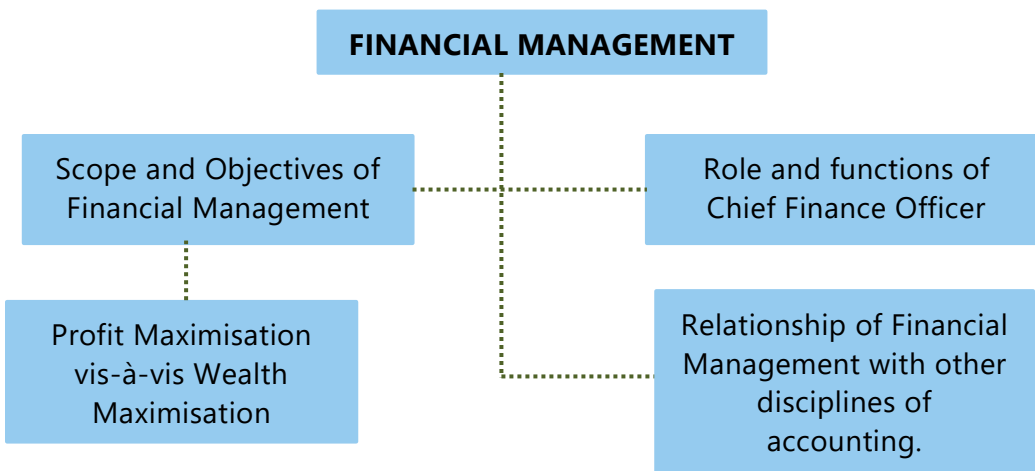


LEARNING OUTCOMES

After studying this chapter, you would be able to -

- ◆ State the meaning, importance and scope of Financial Management in an entity.
- ◆ Discuss Financing decision/functions.
- ◆ Discuss the objectives of Financial Management; Profit maximisation vis-a-vis Wealth maximisation.
- ◆ Discuss Shareholders value maximising approach.
- ◆ Examine the role and functions of Finance executives in an entity.
- ◆ Discuss Financial Distress and Insolvency.
- ◆ Discuss Agency Cost and its Mitigation.
- ◆ Discuss Agency Problem and Agency Cost.

CHAPTER OVERVIEW



1. INTRODUCTION

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

Stage 1	Stage 2	Stage 3	Stage 4
Decide which assets (premises, machinery, equipment etc.) to buy.	Determining what is total investment (since assets cost money) required for buying assets.	Apart from buying assets the entrepreneur would also need to determine how much cash he would need to run the daily operations (payment for raw material, salaries, wages etc.). In other words this is also defined as Working Capital requirement.	The next stage is to decide what all sources, does the entrepreneur need to tap to finance the total investment (assets and working capital). The sources could be Share Capital (Including Entrepreneur's own funds) or Borrowing from Banks or Investment from Financial Institutions etc.

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

Thus, financial management is concerned with **efficient acquisition (financing) and allocation** (investment in assets, working capital etc.) of funds with an objective to make profit (dividend) for owners. In other words, focus of financial management is to address three major financial decision areas namely, **investment, financing and dividend decisions.**

Any business enterprise requiring money and the 3 key questions being enquired into

1. Where to get the money from? **(Financing Decision)**
2. Where to invest the money? **(Investment Decision)**
3. How much to distribute amongst shareholders to keep them satisfied? **(Dividend Decision)**



2. MEANING OF FINANCIAL MANAGEMENT

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

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

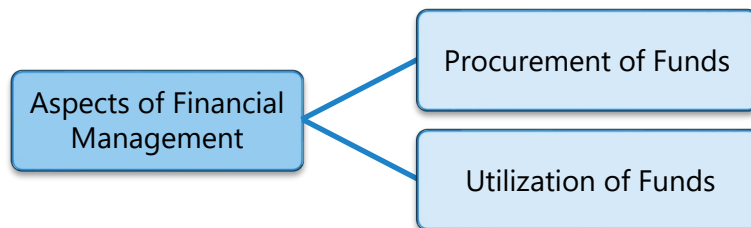
"Financial Management comprises of forecasting, planning, organizing, directing, co-ordinating and controlling of all activities relating to acquisition and application of the financial resources of an undertaking in keeping with its financial objective.

Another very elaborate definition given by Phillippatus is:

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

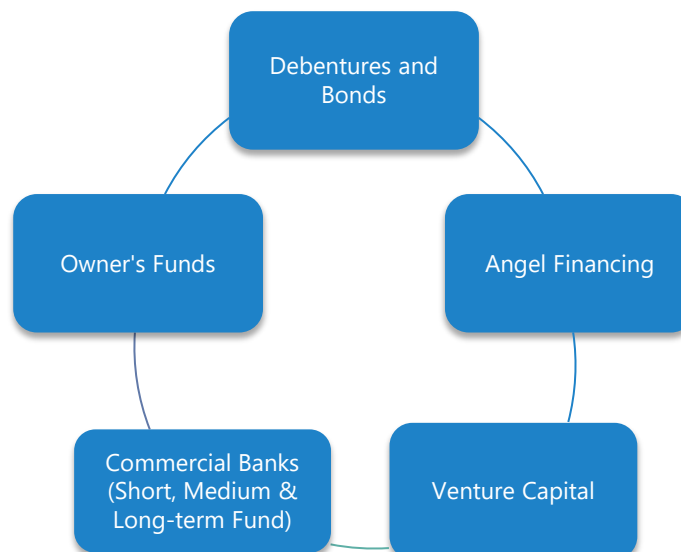
As such it deals with the situations that require selection of specific assets (or combination of assets), the selection of specific problem of size and growth of an enterprise. The analysis of these decisions is based on the expected inflows and outflows of funds and their effect on managerial objectives.

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



2.1 Procurement of Funds

Since funds can be obtained from different sources therefore their procurement is always considered as a complex problem by business concerns. Some of the **sources for funds** for a business enterprise are:



In a global competitive scenario, it is not enough to depend on the available ways of raising finance but resource mobilization has to be undertaken through innovative ways on financial products which may meet the needs of investors. We are constantly seeing new and creative sources of funds which are helping the modern businesses to grow faster. For example: trading in Carbon Credits is turning out to be another source of funding.

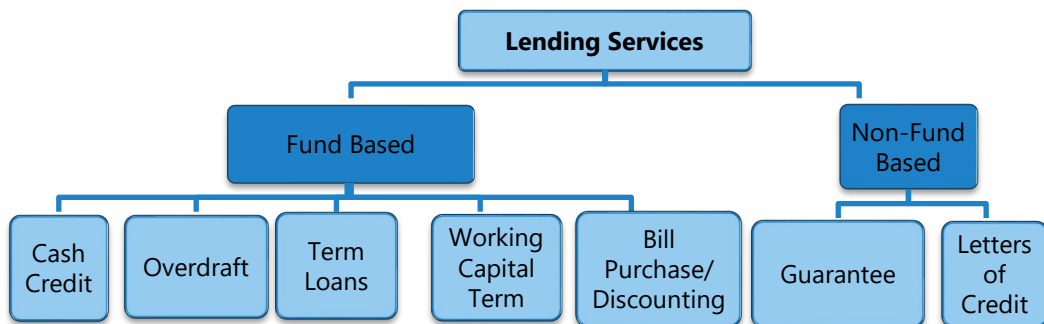
Funds procured from different sources have different characteristics in terms of risk, cost and control. The cost of funds should be at the minimum level for that a proper balancing of risk and control factors must be carried out.

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

Let us discuss some of the sources of funds (discussed in detail in later chapters):

- (a) **Equity:** The funds raised by the issue of equity shares are the best from the risk point of view for the firm, since there is no question of repayment of equity capital except when the firm is under liquidation. From the cost point of view, however, equity capital is usually the most expensive source of funds. This is because the dividend expectations of shareholders are normally higher than prevalent interest rate and also because dividends are an appropriation of profit, not allowed as an expense under the Income Tax Act. Also the issue of new shares to public may dilute the control of the existing shareholders.
- (b) **Debentures:** Debentures as a source of funds are comparatively cheaper than the shares because of their tax advantage. The interest the company pays on a debenture is free of tax, unlike a dividend payment which is made from the taxed profits. However, even when times are hard, interest on debenture loans must be paid whereas dividends need not be. However, debentures entail a high degree of risk since they have to be repaid as per the terms of agreement. Also, the interest payment has to be made whether or not the company makes profits.

- (c) **Funding from Banks:** Commercial Banks play an important role in funding of the business enterprises. Apart from supporting businesses in their routine activities (deposits, payments etc.) they play an important role in meeting the long term and short term needs of a business enterprise. Different lending services provided by Commercial Banks are depicted as follows:-



- (d) **International Funding:** Funding today is not limited to domestic market. With liberalization and globalization a business enterprise has options to raise capital from International markets also. Foreign Direct Investment (FDI) and Foreign Institutional Investors (FII) are two major routes for raising funds from foreign sources besides ADR's (American depository receipts) and GDR's (Global depository receipts). Obviously, the mechanism of procurement of funds has to be modified in the light of the requirements of foreign investors.
- (e) **Angel Financing:** Angel Financing is a form of an equity-financing where an angel investor is a wealthy individual who provides capital for start-up or expansion, in exchange for an ownership/equity in the company. Angel investors have idle cash available and are looking for a higher rate of return than what is given by traditional investments. Typically, angels, as they are known as, will invest around 25 to 60 per cent to help a company get started. This source of finance sometimes is the last option for startups which doesn't qualify for bank funding and are too small for venture capital financing.

2.2 Effective Utilisation of Funds

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

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

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

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



3. EVOLUTION OF FINANCIAL MANAGEMENT

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

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

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

The Modern Phase: Modern phase is still going on. The scope of Financial Management has greatly increased now. It is important to carry out financial analysis for a company. This analysis helps in decision making. During this phase, many theories have been developed regarding efficient markets, capital budgeting, option pricing, valuation models and also in several other important fields in financial management.



4. FINANCE FUNCTIONS/ FINANCE DECISION

Value of a firm will depend on various finance functions/decisions. It can be expressed as :

$$V = f (I, F, D).$$

The finance functions are divided into long term and short term functions/decisions

Long term Finance Function Decisions

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

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

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

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

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

Short-term Finance Decisions/ Function

Working Capital Management (WCM): Generally short term decision are reduced to management of current asset and current liability (i.e., working capital Management)



5. IMPORTANCE OF FINANCIAL MANAGEMENT

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

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

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

- ◆ **Taking care** not to over-invest in fixed assets
- ◆ **Balancing** cash-outflow with cash-inflows
- ◆ **Ensuring** that there is a sufficient level of short-term working capital
- ◆ **Setting** sales revenue targets that will deliver growth
- ◆ **Increasing** gross profit by setting the correct pricing for products or services
- ◆ **Controlling** the level of general and administrative expenses by finding more cost-efficient ways of running the day-to-day business operations, and
- ◆ **Tax planning** that will minimize the taxes a business has to pay.



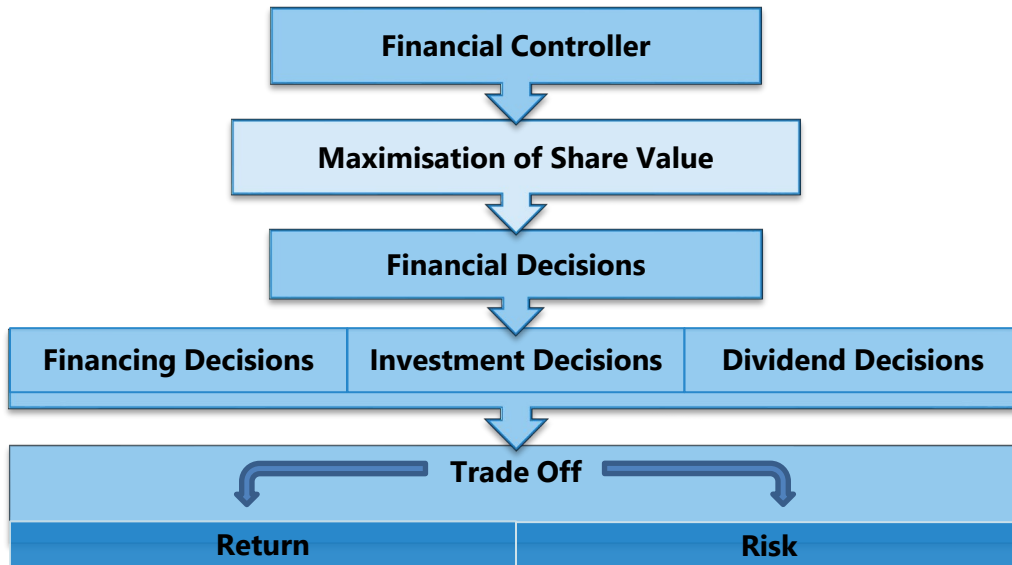
6. SCOPE OF FINANCIAL MANAGEMENT

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

- (a) **Determination** of size of the enterprise and determination of rate of growth.
- (b) **Determining** the composition of assets of the enterprise.
- (c) **Determining** the mix of enterprise's financing i.e. consideration of level of debt to equity, etc.
- (d) **Analysis, planning and control** of financial affairs of the enterprise.

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

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

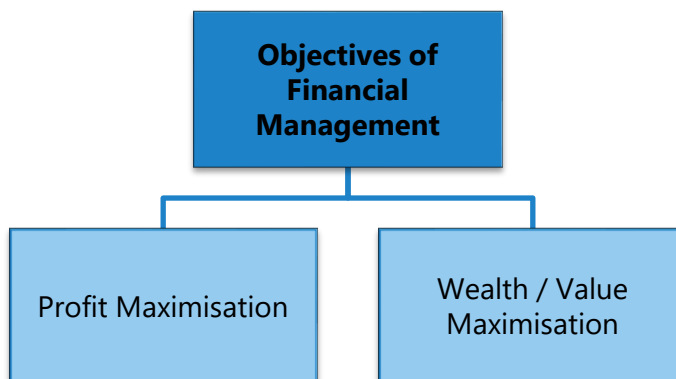


An Overview of Financial Controller



7. OBJECTIVES OF FINANCIAL MANAGEMENT

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



7.1 Profit Maximisation

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

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

- (i) **The term profit is vague. It does not clarify what exactly it means.** It conveys a different meaning to different people. For example, profit may be in short term or long term period; it may be total profit or rate of profit etc.
- (ii) **Profit maximisation has to be attempted with a realisation of risks involved.** There is a direct relationship between risk and profit. Many risky propositions yield high profit. Higher the risk, higher is the possibility of profits. If profit maximisation is the only goal, then risk factor is altogether ignored. This implies that finance manager will accept highly risky proposals also, if they give high profits. In practice, however, risk is very important consideration and has to be balanced with the profit objective.
- (iii) **Profit maximisation as an objective does not take into account the time pattern of returns.** Proposal A may give a higher amount of profits as compared to proposal B, yet if the returns of proposal A begin to flow say 10 years later, proposal B may be preferred which may have lower overall profit but the returns flow is more early and quick.
- (iv) **Profit maximisation as an objective is too narrow.** It fails to take into account the social considerations as also the obligations to various interests of workers, consumers, society, as well as ethical trade practices. If these factors are ignored, a company cannot survive for long. Profit maximization at the cost of social and moral obligations is a short sighted policy.

7.2 Wealth Maximisation/ Value Creation

We will first like to define what is Wealth Maximization Model. Shareholders wealth are the result of cost benefit analysis adjusted with their timing and risk i.e. time value of money.

So,

$$\text{Wealth} = \text{Present value of benefits} - \text{Present Value of Costs}$$

It is important that benefits measured by the finance manager are in terms of cash flow. Finance manager should emphasis on Cash flow for investment or financing decisions not on Accounting profit. The shareholder value maximization model holds that the primary goal of the firm is to maximize its market value and implies that business decisions should seek to increase the net present value of the economic profits of the firm. So, for measuring and maximising shareholders wealth finance manager should follow:

- ◆ **Cash Flow approach not Accounting Profit**
- ◆ **Cost benefit analysis**
- ◆ **Application of time value of money.**

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

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

Stockholders hire managers to run their firms for them.....



Because stockholders have absolute power to hire and fire managers.

Managers set aside their interest and maximise stock prices...



Because markets are efficient.

Stockholders wealth is maximised....



Because lenders are fully protected from shareholders actions.

Firm value is maximised....



Because there are no costs created for society.

Societal wealth is maximised...

Value of a firm (V) = Number of Shares (N) × Market price of shares (MP)

Or

$V = \text{Value of equity } (V_e) + \text{Value of debt } (V_d)$

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

- ◆ Achieving a higher growth rate
- ◆ Attaining a larger market share
- ◆ Gaining leadership in the market in terms of products and technology
- ◆ Promoting employee welfare
- ◆ Increasing customer satisfaction
- ◆ Improving community life, supporting education and research, solving societal problems, etc.

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



8. CONFLICTS IN PROFIT VERSUS VALUE MAXIMISATION PRINCIPLE

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

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

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

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

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

Goal	Objective	Advantages	Disadvantages
Profit Maximization	Large amount of profits	(i) Easy to calculate profits (ii) Easy to determine the link between financial decisions and profits.	(i) Emphasizes the short term gains (ii) Ignores risk or uncertainty (iii) Ignores the timing of returns (iv) Requires immediate resources.
Shareholders Wealth Maximisation	Highest market value of shares.	(i) Emphasizes the long term gains (ii) Recognises risk or uncertainty (iii) Recognises the timing of returns (iv) Considers shareholders' return.	(i) Offers no clear relationship between financial decisions and share price. (ii) Can lead to management anxiety and frustration.

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

Following illustration can be taken to understand why wealth maximization is a preferred objective than profit maximization.

ILLUSTRATION 1

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

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

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



9. ROLE OF FINANCE EXECUTIVE

Modern financial management has come a long way from the traditional corporate finance. As the economy is opening up and global resources are being tapped, the opportunities available to finance managers virtually have no limits.

A new era has ushered during the recent years for chief financial officers in different organisation to finance executive is known in different name, however their role and functions are similar. His role assumes significance in the present day context of liberalization, deregulation and globalisation.

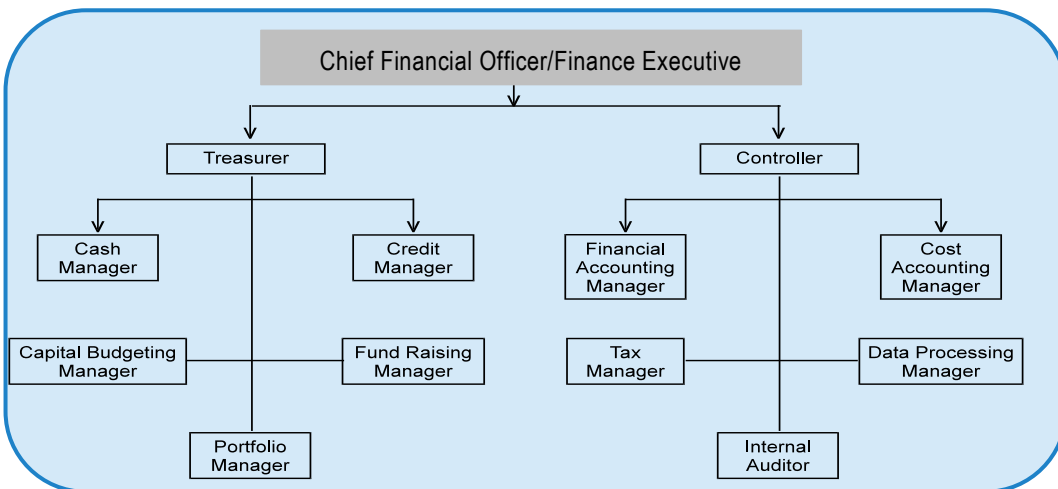
Changing Role of the Finance Executive

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

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

- (a) **Financial analysis and planning:** Determining the proper amount of funds to employ in the firm, i.e. designating the size of the firm and its rate of growth.
- (b) **Investment decisions:** The efficient allocation of funds to specific assets.
- (c) **Financing and capital structure decisions:** Raising funds on favourable terms as possible i.e. determining the composition of liabilities.
- (d) **Management of financial resources** (such as working capital).
- (e) **Risk management:** Protecting assets.

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



Organisation of Finance Function

9.1 Role of Finance Executive in today's World vis-a-vis in the past

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

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



10. FINANCIAL DISTRESS AND INSOLVENCY

There are various factors like price of the product/ service, demand, price of inputs e.g. raw material, labour etc., which is to be managed by an organisation on a continuous basis. Proportion of debt also need to be managed by an organisation very delicately. Higher debt requires higher interest and if the cash inflow is not sufficient then it will put lot of pressure to the organisation. Both short term and long term creditors will put stress to the firm. If all the above factors are not well managed by the firm, it can create situation known as distress, so financial distress is a position where Cash inflows of a firm are inadequate to meet all its current obligations.

Now if distress continues for a long period of time, firm may have to sell its asset, even many times at a lower price. Further when revenue is inadequate to revive the situation, firm will not be able to meet its obligations and become insolvent. So, **insolvency basically means inability of a firm to repay various debts and is a result of continuous financial distress.**



11. RELATIONSHIP OF FINANCIAL MANAGEMENT WITH RELATED DISCIPLINES

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

11.1 Financial Management and Accounting

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

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

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

Treatment of Funds

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

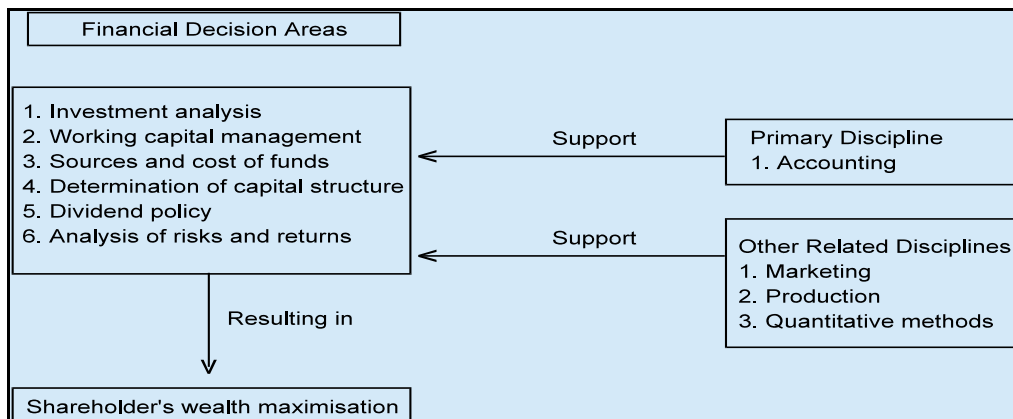
Decision-making

The purpose of accounting is to collect and present financial data of the past, present and future operations of the organization. The financial manager uses these data for financial decision making. It is not that the financial managers cannot collect data or accountants cannot make decisions, but the chief focus of an accountant is to collect data and present the data while the financial manager's primary responsibility relates to financial planning, controlling and

decision making. Thus, in a way it can be stated that financial management begins where accounting ends.

11.2 Financial Management and Other Related Disciplines

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



Impact of Other Disciplines on Financial Management

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



12. AGENCY PROBLEM AND AGENCY COST



Agency Problem

Though in a sole proprietorship firm, partnership etc., owners participate in management but in corporates, owners are not active in management so, there is a separation between owner/ shareholders and managers. In theory managers should act in the best interest of shareholders however in reality, managers may try to maximise their individual goal like salary, perks etc., so there is a **principal agent relationship between managers and owners, which is known as Agency Problem**. In a nutshell, Agency Problem is the chances that managers may place personal goals ahead of the goal of owners. Agency Problem leads to Agency Cost. Agency cost is the additional cost borne by the shareholders to monitor the manager and control their behaviour so as to maximise shareholders wealth. Generally, Agency Costs are of four types (i) monitoring (ii) bonding (iii) opportunity (iv) structuring.

Addressing the agency problem

The agency problem arises if manager's interests are not aligned to the interests of the debt lender and equity investors. The agency problem of debt lender would be addressed by imposing negative covenants i.e. the managers cannot borrow beyond a point. This is one of the most important concepts of modern day finance and the application of this would be applied in the Credit Risk Management of Bank, Fund Raising, Valuing distressed companies.

Agency problem between the managers and shareholders can be addressed if the interests of the managers are aligned to the interests of the share- holders. It is easier said than done.

However, following efforts have been made to address these issues:

- ◆ Managerial compensation is linked to profit of the company to some extent and also with the long term objectives of the company.
- ◆ Employee is also designed to address the issue with the underlying assumption that maximisation of the stock price is the objective of the investors.
- ◆ Effecting monitoring can be done.

SUMMARY

- ◆ Financial Management is concerned with efficient acquisition (financing) and allocation (investment in assets, working capital etc) of funds.
- ◆ In the modern times, the Financial Management includes besides procurement of funds, the three different kinds of decisions as well namely investment, financing and dividend.
- ◆ Out of the two objectives, profit maximization and wealth maximization, in today's real world situations which is uncertain and multi-period in nature, wealth maximization is a better objective.
- ◆ Today the role of Chief Financial Officer, or CFO, is no longer confined to accounting, financial reporting and risk management. It's about being a strategic business partner of the Chief Executive Officer.
- ◆ The relationship between Financial Management and Accounting are closely related to the extent that accounting is an important input in financial decision making.
- ◆ Managers may work against the interest of the shareholders and try to fulfill their own objectives. This is known as Agency Problem.

TEST YOUR KNOWLEDGE

Multiple Choice Questions (MCQs)

1. *Focus of financial management is mainly concerned with the decision related to:*
 - (a) *Financing*
 - (b) *Investing*
 - (c) *Dividend*
 - (d) *All of above.*
2. *The main objective of financial management is to:*
 - (a) *Secure profitability*
 - (b) *Maximise shareholder wealth*
 - (c) *Enhancing the cost of debt*
 - (d) *None of above.*
3. *The shareholder value maximisation model holds that the primary goal of the firm is to maximise its:*
 - (a) *Accounting profit*
 - (b) *Liquidity*
 - (c) *Market value*
 - (d) *Working capital.*
4. *Wealth maximisation approach is based on the concept of:*
 - (a) *Cost benefit analysis*
 - (b) *Cash flow approach*
 - (c) *Time value of money*
 - (d) *All of the above.*

5. *Management of all matters related to an organisation's finances is called:*
 - (a) *Cash inflows and outflows*
 - (b) *Allocation of resources*
 - (c) *Financial management*
 - (d) *Finance.*
6. *Which of the following is the disadvantage of having shareholders wealth maximisation goals?*
 - (a) *Emphasizes the short-term gains.*
 - (b) *Ignores the timing of returns.*
 - (c) *Requires immediate resources.*
 - (d) *Offers no clear relationship between financial decisions and share price.*
7. *The most important goal of financial management is:*
 - (a) *Profit maximisation*
 - (b) *Matching income and expenditure*
 - (c) *Using business assets effectively*
 - (d) *Wealth maximisation.*
8. *To achieve wealth maximization, the finance manager has to take careful decision in respect of:*
 - (a) *Investment*
 - (b) *Financing*
 - (c) *Dividend*
 - (d) *All the above.*
9. *Early in the history of finance, an important issue was:*
 - (a) *Liquidity*
 - (b) *Technology*
 - (c) *Capital structure*
 - (d) *Financing options.*

10. Which of the following are microeconomic variables that help define and explain the discipline of finance?
- (a) Risk and return
 - (b) Capital structure
 - (c) Inflation
 - (d) All of the above.
11. Financial Management is mainly concerned with the-
- (a) Acquiring and developing assets to forfeit its overall benefit.
 - (b) Acquiring, financing and managing assets to accomplish the overall goal of a business enterprise.
 - (c) Efficient management of the business.
 - (d) Sole objective of profit maximisation.
12. Which of the following need not be followed by the finance manager for measuring and maximising shareholders' wealth?
- (a) Accounting profit analysis.
 - (b) Cash Flow approach.
 - (c) Cost benefit analysis.
 - (d) Application of time value of money.

Theoretical Questions

1. POINT OUT the difference between Financial Management & Financial Accounting.
2. "Financial Management is concerned with acquisition & financing of short term & long-term credit". ELABORATE.
3. DISCUSS the two main aspects of the finance function.
4. DISCUSS three main considerations in procuring funds.
5. EXPLAIN "Wealth maximisation" and "Profit maximisation" objectives of financial management.
6. DISCUSS the role of a chief financial officer.

7. *In recent years, there have been a number of environmental, pollution and other regulations imposed on businesses. In view of these changes, is maximisation of shareholder wealth still a realistic objective? EXPLAIN.*

ANSWERS

Answers to the MCQs

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

Answers to the Theoretical Questions

1. Please refer paragraph 11.1
2. Please refer paragraph 2
3. Please refer paragraph 4
4. Please refer paragraph 2.1
5. Please refer paragraph 7
6. Please refer paragraph 9
7. Please refer paragraph 8

TYPES OF FINANCING

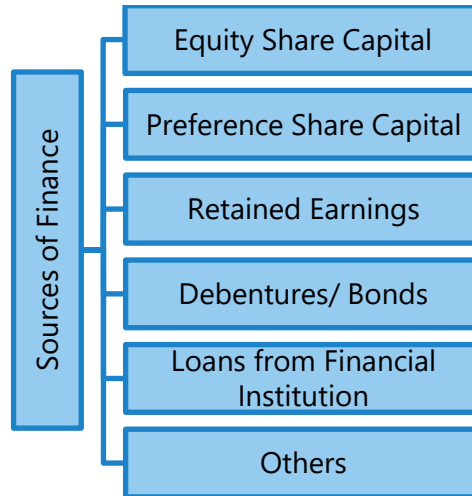


LEARNING OUTCOMES

After studying this chapter, you would be able to -

- ◆ Describe the different sources of finance available to a business, both internal and external.
- ◆ Discuss the various long term, medium term and short-term sources of finance.
- ◆ Discuss in detail some of the important sources of finance, this would include Venture Capital financing, Lease financing and financing of export trade by banks.
- ◆ Discuss the concept of Securitization.
- ◆ Discuss the financing in the International market by understanding various financial instruments prevalent in the international market.

CHAPTER OVERVIEW



1. FINANCIAL NEEDS AND SOURCES OF FINANCE OF A BUSINESS

Financial Needs of a Business

Business enterprises need funds to meet their different types of requirements. All the financial needs of a business may be grouped into the following three categories:

- (i) **Long-term financial needs:** Such needs generally refer to those requirements of funds which are for a period exceeding 5-10 years. All investments in plant, machinery, land, buildings, etc., are considered as long-term financial needs. Funds required to finance permanent or hard-core working capital should also be procured from long term sources.
- (ii) **Medium-term financial needs:** Such requirements refer to those funds which are required for a period exceeding one year but not exceeding 5 years. This might be needed for stores and spares, critical spares, tools, dies, moulds.

- (iii) **Short-term financial needs:** Such type of financial needs arise to finance current assets such as stock, debtors, cash etc. Investment in these assets are known as meeting of working capital requirements of the concern. The main characteristic of short-term financial needs is that they arise for a short period of time not exceeding the accounting period. i.e., one year.

Basic Principle for Funding Various Needs

The basic principle for meeting the short-term financial needs of a concern is that such needs should be met from short term sources, and medium-term financial needs from medium term sources and long term financial needs from long term sources. Accordingly, the method of raising funds is to be decided with reference to the period for which funds are required.

General rule for financing of different assets would take place. These rules can be changed depending on the nature of borrower i.e. depending on the borrower's level of operation Besides, the stage of development of the business and nature of business would also decide the type of borrowing. Generally, it can be as follows:

Stage	Nature of Business	Sources of Fund
Early stage	High Uncertainty	Equity; mainly Angel fund
	High to moderate Uncertainty	Equity; Venture capital; Debt
Growth Stage	Moderate to Low Uncertainty	Debt; Venture Capital; Private Equity
Stable stage	Low Uncertainty	Debt

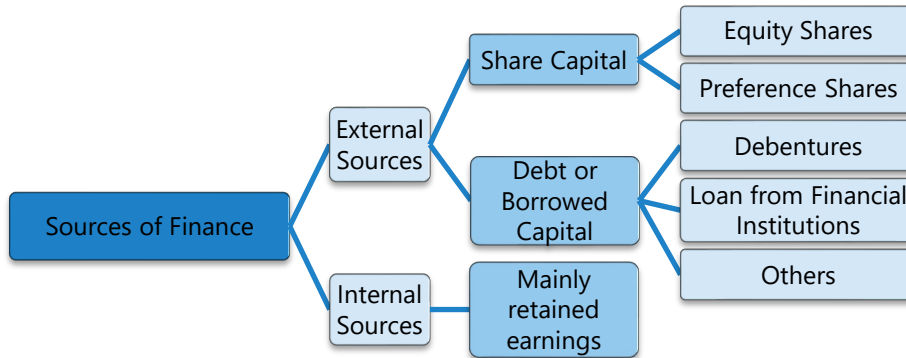


2. CLASSIFICATION OF FINANCIAL SOURCES

There are mainly two ways of classifying various financial sources (i) Based on basic Sources (ii) Based on Maturity of repayment period (iii) Based on Ownership and Control.

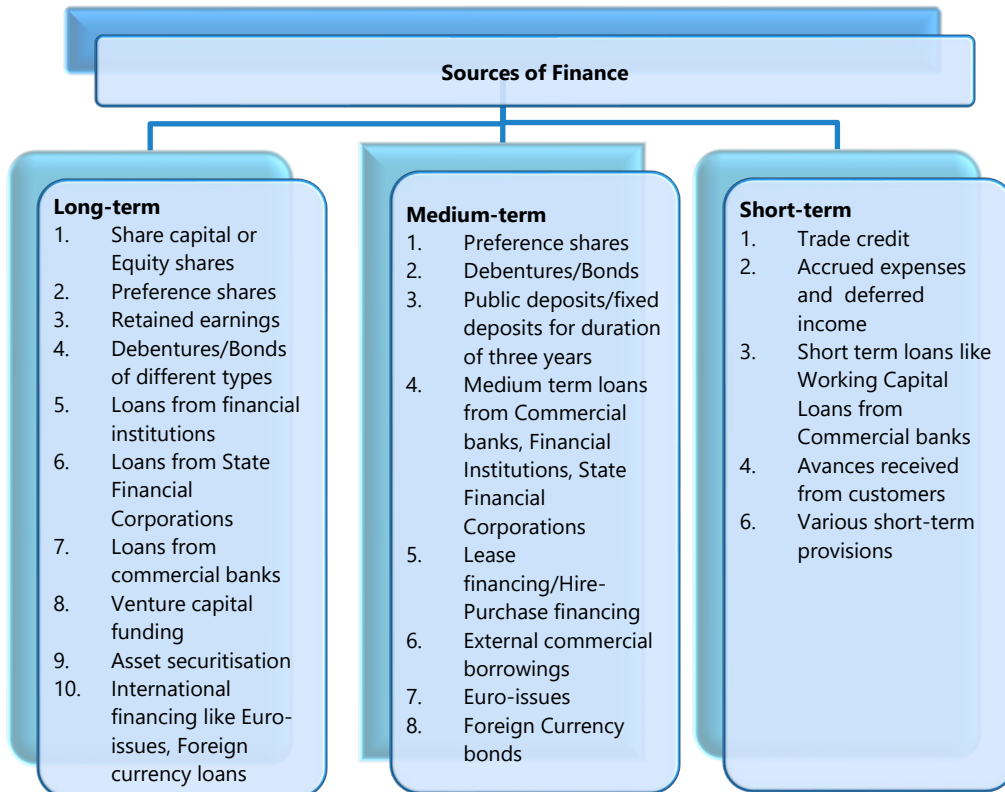
2.1 Sources of Finance based on Basic Sources

Based on basic sources of finance, types of financing can be classified as below:



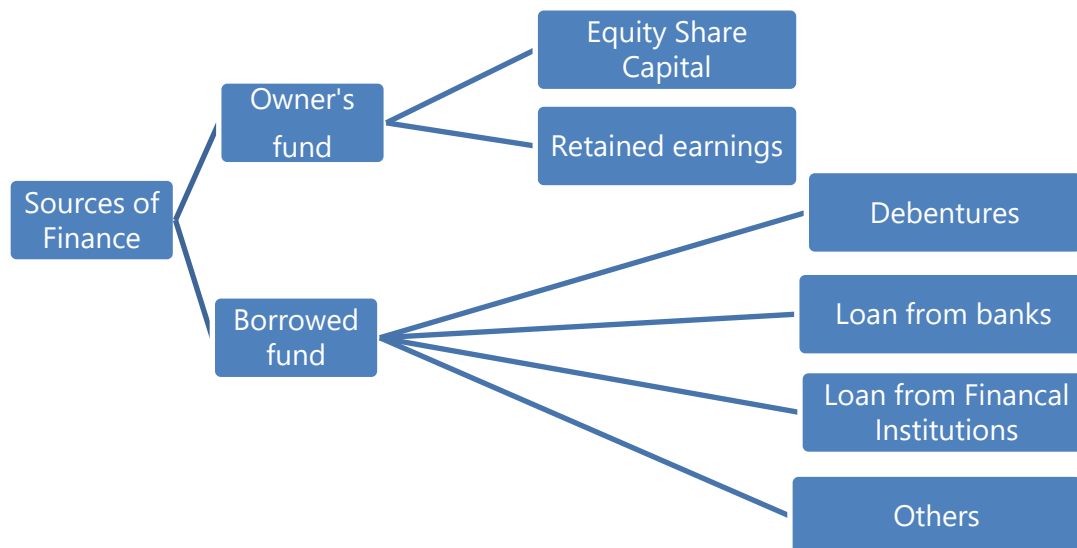
2.2 Sources of Finance based on Maturity of Payment

Based on maturity of payment, types of financing can be classified as below:



2.3 Sources of Finance based on Ownership and Control.

Based on Ownership and Control, types of financing can be classified as below:



3. LONG-TERM SOURCES OF FINANCE

There are different sources of funds available to meet long term financial needs of the business. These sources may be broadly classified into:

- ◆ **Share capital** (both equity and preference) &
- ◆ **Debt** (including debentures, long term borrowings or other debt instruments).

The different sources of long-term finance have been discussed as follows:

3.1 Owners Capital or Equity Capital

A public limited company may raise funds from promoters or from the investing public by way of owner's capital or equity capital by issuing ordinary equity shares. Some of the characteristics of Owners/Equity Share Capital are:

- ◆ It is a source of permanent capital. The holders of such share capital in the company are called equity shareholders or ordinary shareholders.

- ◆ Equity shareholders are practically owners of the company as they undertake the highest risk.
- ◆ Equity shareholders are entitled to dividends after the income claims of other stakeholders are satisfied. The dividend payable to them is an appropriation of profits and not a charge against profits.
- ◆ In the event of winding up, ordinary shareholders can exercise their claim on assets after the claims of the other suppliers of capital have been met.
- ◆ The cost of ordinary shares is usually the highest. This is due to the fact that such shareholders expect a higher rate of return (as their risk is the highest) on their investment as compared to other suppliers of long-term funds.
- ◆ Ordinary share capital also provides a security to other suppliers of funds. Any institution giving loan to a company would make sure the debt-equity ratio is comfortable to cover the debt. There can be various types of equity shares like New issue, Rights issue, Bonus Shares, Sweat Equity.

Advantages of raising funds by issue of equity shares are:

- (i) It is a permanent source of finance. Since such shares are not redeemable, the company has no liability for cash outflows associated with its redemption. In other words, once the company has issued equity shares, they are tradable i.e. they can be purchased and sold. So, a company is in no way responsible for any cash outflows of investors by which they become the shareholders of the company by purchasing the shares of existing shareholders.
- (ii) Equity capital increases the company's financial base and thus helps to further the borrowing powers of the company. In other words, by issuing equity shares, a company manage to raise some money for its capital expenditures and this helps it to raise more funds with the help of debt. This is because; debt will enable the company to increase its earnings per share and consequently, its share prices.
- (iii) A company is not obliged legally to pay dividends. Hence in times of uncertainties or when the company is not performing well, dividend payments can be reduced or even suspended.

- (iv) A company can make further increase its share capital by initiating a right issue.

Disadvantages of raising funds by issue of equity shares are:

Apart from the above mentioned advantages, raising of funds through equity share capital has some disadvantages in comparison to other sources of finance. These are as follows:

- (i) Investors find ordinary shares riskier because of uncertain dividend payments and capital gains.
- (ii) The issue of new equity shares reduces the earning per share of the existing shareholders until and unless the profits are proportionately increased.
- (iii) The issue of new equity shares can also reduce the ownership and control of the existing shareholders.

3.2 Preference Share Capital

These are special kind of shares; the holders of such shares enjoy priority, both as regard to the payment of a fixed amount of dividend and also towards repayment of capital on winding up of the company. Some of the characteristics of Preference Share Capital are as follows:

- ◆ Long-term funds from preference shares can be raised through a public issue of shares.
- ◆ Such shares are normally cumulative, *i.e.*, the dividend payable in a year of loss gets carried over to the next year till there are adequate profits to pay the cumulative dividends.
- ◆ The rate of dividend on preference shares is normally higher than the rate of interest on debentures, loans etc.
- ◆ Most of preference shares these days carry a stipulation of period and the funds have to be repaid at the end of a stipulated period.
- ◆ Preference share capital is a hybrid form of financing which imbibes within itself some characteristics of equity capital and some attributes of debt capital. It is similar to equity because preference dividend, like equity

dividend is not a tax-deductible payment. It resembles debt capital because the rate of preference dividend is fixed.

- ◆ Cumulative Convertible Preference Shares (CCPs) may also be offered, under which the shares would carry a cumulative dividend of specified limit for a period of say three years after which the shares are converted into equity shares. These shares are attractive for projects with a long gestation period.
- ◆ Preference share capital may be redeemed at a pre decided future date or at an earlier stage inter alia out of the profits of the company. This enables the promoters to withdraw their capital from the company which is now self-sufficient, and the withdrawn capital may be reinvested in other profitable ventures.

Various types of Preference shares can be as below:

Sl. No.	Type of Preference Shares	Salient Features
1	Cumulative	Arrear Dividend will accumulate.
2	Non-cumulative	No right to arrear dividend.
3	Redeemable	Redemption should be done.
4	Participating	Can participate in the surplus which remains after payment to equity shareholders.
5	Non-Participating	Cannot participate in the surplus after payment of fixed rate of Dividend.
6	Convertible	Option of converting into equity Shares.

Advantages of raising funds by issue of preference shares are:

- (i) No dilution in EPS on enlarged capital base – On the other hand if equity shares are issued it reduces EPS, thus affecting the market perception about the company.

- (ii) There is also the advantage of leverage as it bears a fixed charge (because companies are required to pay a fixed rate of dividend in case of a issue of preference shares). Non-payment of preference dividends does not force a company into liquidity.
- (iii) There is no risk of takeover as the preference shareholders do not have voting rights except where dividend payment are in arrears.
- (iv) The preference dividends are fixed and pre-decided. Hence preference shareholders cannot participate in surplus profits as the ordinary shareholders can except in case of participating preference shareholders.
- (v) Preference capital can be redeemed after a specified period.

Disadvantages of raising funds by issue of preference shares are:

- (i) One of the major disadvantages of preference shares is that preference dividend is not tax deductible and so does not provide a tax shield to the company. Hence preference shares are costlier to the company than debt e.g. debenture.
- (ii) Preference dividends are cumulative in nature. This means that if in a particular year preference dividends are not paid they shall be accumulated and paid later. Also, if these dividends are not paid, no dividend can be paid to ordinary shareholders. The non-payment of dividend to ordinary shareholders could seriously impair the reputation of the concerned company.

Difference between Equity Shares and Preference Shares are as follows:

Sl. No.	Basis of Distinction	Equity Share	Preference Share
1	Dividend payment	Equity Dividend is paid after preference dividend.	Payment of preference dividend is preferred over equity dividend.
2	Rate of dividend	Fluctuating	Fixed
3	Convertibility	Not convertible	Convertible
4	Voting rights	Equity shareholders enjoy full voting rights.	They have very limited voting rights.

3.3 Retained Earnings

Long-term funds may also be provided by **accumulating the profits of the company and by ploughing them back into business**. Such funds belong to the ordinary shareholders and increase the net worth of the company. A public limited company must plough back a reasonable amount of profit every year keeping in view the legal requirements in this regard and also for its own expansion plans. Such funds also entail almost no risk. Further, control of present owners is also not diluted by retaining profits.

The decision to plough back depends on the rate of return generated by company vs expected cost of equity. This is further discussed in dividend decision chapter.

3.4 Debentures

Loans can be raised from public by issuing debentures or bonds by public limited companies. Some of the characteristics of debentures are:

- ◆ Debentures are normally issued in different denominations ranging from ₹ 100 to ₹ 1,000 and carry different rates of interest.
- ◆ Normally, debentures are issued on the basis of a debenture trust deed which lists the terms and conditions on which the debentures are floated.
- ◆ Debentures are basically instruments for raising long-term debt capital.
- ◆ The period of maturity normally varies from 3 to 10 years and may also increase for projects having high gestation period.
- ◆ Debentures are either secured or unsecured.
- ◆ They may or may not be listed on the stock exchange.
- ◆ The cost of capital raised through debentures is quite low since the interest payable on debentures can be charged as an expense before tax.
- ◆ From the investors' point of view, debentures offer a more attractive prospect than the preference shares since interest on debentures is payable whether or not the company makes profits.

Debentures can be divided into the following three categories based on their convertibility:

- (i) **Non-convertible debentures** – These types of debentures do not have any feature of conversion and are repayable on maturity.
- (ii) **Fully convertible debentures** – Such debentures are converted into equity shares as per the terms of issue in relation to price and the time of conversion. Interest rates on such debentures are generally less than the non-convertible debentures because they carry an attractive feature of getting themselves converted into shares at a later time.
- (iii) **Partly convertible debentures** – These debentures carry features of both convertible and non-convertible debentures. The investor has the advantage of having both the features in one debenture.

Other types of Debentures with their features are as follows:

Sl. No.	Type of Debenture	Salient Feature
1	Bearer	Transferable like negotiable instruments
2	Registered	Interest payable to registered person
3	Mortgage	Secured by a charge on Asset(s)
4	Naked or simple	Unsecured
5	Redeemable	Repaid after a certain period
6	Non-Redeemable	Not repayable

Advantages of raising finance by issue of debentures are:

- (i) The cost of debentures is much lower than the cost of preference or equity capital as the interest is tax-deductible. Also, investors consider debenture investment safer than equity or preferred investment and, hence, may require a lower return on debenture investment.
- (ii) Debenture financing does not result in dilution of control.
- (iii) In a period of rising prices, debenture issue is advantageous. The fixed monetary outgo decreases in real terms as the price level increases. In other words, the company has to pay a fixed rate of interest.

Disadvantages of debenture financing are:

- (i) Debenture interest and the repayment of its principal amount is an obligatory payment.
- (ii) The protective covenants associated with a debenture issue may be restrictive.
- (iii) Debenture financing enhances the financial risk associated with the firm because of the reasons given in point (i).
- (iv) Since debentures need to be paid at the time of maturity, a large amount of cash outflow is needed at that time.

Public issue of debentures and private placement to mutual funds now require that a debenture issue must be rated by a credit rating agency like CRISIL (Credit Rating and Information Services of India Ltd.). The credit rating is given after evaluating factors like track record of the company, profitability, debt servicing capacity, credit worthiness and the perceived risk of lending.

Difference between Preference Shares and Debentures

Basis of difference	Preference shares	Debentures
Ownership	Preference Share Capital is a special kind of share	Debenture is a type of loan which can be raised from the public
Payment of Dividend/ Interest	The preference shareholders enjoy priority both as regard to the payment of a fixed amount of dividend and also towards repayment of capital in case of winding up of a company	It carries fixed percentage of interest.
Nature	Preference shares are a hybrid form of financing with some characteristic of equity shares and some attributes of Debt Capital.	Debentures are instrument for raising long term capital with a fixed period of maturity.

3.5 Bond

Bond is fixed income security created to raise fund. Bonds can be raised through Public Issue and through Private Placement.

Types of Bonds

Based on call, Bonds can be categorized as:

- (i) Callable bonds, (ii) Puttable bonds
- (i) Callable bonds:** A callable bond has a call option which gives the issuer the right to redeem the bond before maturity at a predetermined price known as the call price (Generally at a premium).
- (ii) Puttable bonds:** Puttable bonds give the investor a put option (i.e. the right to sell the bond) back to the company before maturity.

Various Bonds with their salient features are as follows:

(i) Foreign Bonds

Sl. No.	Name of Bond	Salient Features
1.	Foreign Currency Convertible Bond (FCCB)	<ul style="list-style-type: none"> This bond comes at a very low rate of interest. The advantage to the issuer is that the issuer can get foreign currency at a very low cost. The risk is that in case the bond has to be redeemed on the date of maturity, the issuer has to make the payment and at that time the issuer may not have the money.
2.	Plain Vanilla Bond	<ul style="list-style-type: none"> The issuer would pay the principal amount along with the interest rate. This type of bond would not have any options. This bond can be issued in the form of discounted bond or can be issued in the form of coupon bearing bond.

3.	Convertible Floating Rate Notes (FRN)	<ul style="list-style-type: none"> • A convertible FRN is issued by giving its holder an option to convert it into a longer term debt security with a specified coupon • It protects an investor against falling interest rate • The long- term debt security can be sold in the market and the investor can earn profit • Capital gain is not applicable to FRN
4.	Drop Lock Bond	<ul style="list-style-type: none"> • It is a Floating Rate Note with a normal floating rate • The floating rate bond would be automatically converted into fixed rate bond if interest rate falls below a predetermined level • The new fixed rate stays till the drop lock bond reaches its maturity • The difference between the convertible floating rate note and drop lock bond is that the former is a long option structure and the later one is a short option structure
5.	Variable Rate Demand Obligations	<ul style="list-style-type: none"> • A normal floating rate note with a nominal maturity • The holder of the floating rate note can sell the obligation back to the trustee at par plus accrued interest • It gives the investor an option to exit, so it is more liquid than the normal FRN
6.	Yield Curve Note (YCN)	<ul style="list-style-type: none"> • It is a structured debt security • Yield increases when prevailing interest rate declines • Yield decreases when prevailing interest rate increases • This is used to hedge the interest rate

		<ul style="list-style-type: none"> This works like inverse floater
7.	Euro Bond	<ul style="list-style-type: none"> Euro bonds are issued or traded in a country using a currency other than the one in which the bond is denominated. This means that the bond uses a certain currency, but operates outside the jurisdiction of the Central Bank that issues that currency. Eurobonds are issued by multinational corporations, for example, a British company may issue a Eurobond in Germany, denominating it in U.S. dollars It is important to note that the term has nothing to do with the euro, and the prefix "euro-" is used more generally to refer to deposit outside the jurisdiction of the domestic central bank
8.	Emerging Market Bond	<ul style="list-style-type: none"> A debt instrument issued by the developing countries. It provides higher yields in comparison to U.S. corporate and Treasury bonds. Credit default swap (CDS) is used to protect the bondholders against the default. It tend to carry higher risks than domestic debt instruments.

(ii) Indian Bonds

Sl. No.	Name of Bond	Salient Feature
1.	Masala Bond	<p>Masala (means spice) bond is an Indian name used for Rupee denominated bond that Indian corporate borrowers can sell to investors in overseas markets.</p> <ul style="list-style-type: none"> These bonds are issued outside India but denominated in Indian Rupees.

		<ul style="list-style-type: none"> NTPC raised ₹ 2,000 crore via masala bonds for its capital expenditure in the year 2016.
2.	Municipal Bonds	<p>Municipal bonds are used to finance urban infrastructure are increasingly evident in India.</p> <ul style="list-style-type: none"> Ahmedabad Municipal Corporation issued a first historical Municipal Bond in Asia to raise ₹100 crore from the capital market for part financing a water supply project.
3.	Government or Treasury Bonds	Government or Treasury bonds are bonds issued by Government of India, Reserve Bank of India, any state Government or any other Government department.

Some other bonds are included in other source of Financing (para 8)

3.6 Loans from Financial Institutions

(i) Financial Institution: National

Sl. No.	Name of the Financial Institution	Year of Establishment	Remarks
1	Industrial Finance Corporation of India (IFCI)	1918	Converted into a public company
2	State Financial Corporations (SFCs)	1951	-
3	Industrial Development Bank of India (IDBI)	1954	Converted into Bank
4	National Industrial Development Corporation (NIDC)	1954	-
5	Industrial Credit and Investment Corporation of India (ICICI)	1955	Converted into Bank and Privatised
6	Life Insurance Corporation of India (LIC)	1956	-

7.	Unit Trust of India (UTI)	1964	-
8	Industrial Reconstruction Bank of India (IRBI)	1971	-

(ii) **Financial Institution: International Institutions**

Sl. No.	Name of the Financial Institution	Year of Establishment
1	The World Bank/ International Bank for Reconstruction and Development (IBRD)	1944
2	The International Finance Corporation (IFC)	1956
3	Asian Development Bank (ADB)	1966

3.7 Loans from Commercial Banks

The primary role of the commercial banks is to cater to the short-term requirements of industry. Of late, however, banks have started taking an interest in long term financing of industries in several ways.

- The banks provide long term loans for the purpose of expansion or setting up of new units. Their repayment is usually scheduled over a long period of time. The liquidity of such loans is said to depend on the anticipated income of the borrowers.
- As part of the long-term funding for a company, the banks also fund the long term working capital requirement (it is also called WCTL i.e. working capital term loan). It is funding of that portion of working capital which is always required (the minimum level) and is not impacted by seasonal requirement of the company.

Bridge Finance: Bridge finance refers to loans taken by a company normally from commercial banks for a **short period because of pending disbursement of loans sanctioned by financial institutions**. Though it is of short-term nature but since it is an important step in the facilitation of long-term loan, therefore it is being discussed along with the long term sources of funds. Normally, it takes time for financial institutions to disburse loans to companies. However, once the loans are approved by the term lending institutions, companies, in order not to lose further time in starting their projects, arrange short term loans from commercial banks.

The bridge loans are repaid/ adjusted out of the term loans as and when disbursed by the concerned institutions. Bridge loans are normally secured by hypothecating movable assets, personal guarantees and demand promissory notes. Generally, the rate of interest on bridge finance is higher as compared with that on term loans.

Having discussed funding from share capital (equity/preference), raising of debt from financial institutions and banks, we will now discuss some other important sources of long-term finance.

4. VENTURE CAPITAL FINANCING

4.1 Meaning of Venture Capital Financing

The venture capital financing refers to **financing of new high risky venture promoted by qualified entrepreneurs** who lack experience and funds to give shape to their ideas. In broad sense, under venture capital financing, venture capitalist make investment to purchase equity or debt securities from inexperienced entrepreneurs who undertake highly risky ventures with potential to succeed in future.

4.2 Characteristics of Venture Capital Financing

Some of the characteristics of Venture Capital financing are:

- ◆ It is basically an equity finance in new companies.
- ◆ It can be viewed as a long-term investment in growth-oriented small/medium firms.
- ◆ Apart from providing funds, the investor also provides support in form of sales strategy, business networking and management expertise, enabling the growth of the entrepreneur.

4.3 Methods of Venture Capital Financing

Some common methods of venture capital financing are as follows:

- (i) **Equity financing:** The venture capital undertakings generally require funds for a longer period but may not be able to provide returns to the investors during the initial stages. Therefore, the venture capital finance is generally provided by way of equity share capital. The equity contribution of venture capital firm does not exceed 49% of the total equity capital of venture capital undertakings so that the effective control and ownership remains with the entrepreneur.
- (ii) **Conditional loan:** A conditional loan is repayable in the form of a royalty after the venture is able to generate sales. No interest is paid on such loans. In India venture capital financiers charge royalty ranging between 2 and 15 per cent; actual rate depends on other factors of the venture such as gestation period, cash flow patterns, risk and other factors of the enterprise. Some Venture capital financiers give a choice to the enterprise of paying a high rate of interest (which could be well above 20 per cent) instead of royalty on sales once it becomes commercially sound.
- (iii) **Income note:** It is a hybrid security which combines the features of both conventional loan and conditional loan. The entrepreneur has to pay both interest and royalty on sales but at substantially low rates. IDBI's VCF provides funding equal to 80 – 87.50% of the projects cost for commercial application of indigenous technology.
- (iv) **Participating debenture:** Such security carries charges in three phases — in the start-up phase no interest is charged, next stage a low rate of interest is charged up to a particular level of operation, after that, a high rate of interest is required to be paid.



5. DEBT SECURITISATION

Meaning of Debt Securitisation

Securitisation is a process in which illiquid assets are pooled into marketable securities that can be sold to investors. The process leads to the creation of financial instruments that represent ownership interest in, or are secured by a segregated income producing asset or pool of assets. These assets are generally secured by

personal or real property such as automobiles, real estate, or equipment loans but in some cases are unsecured.

Example of Debt Securitisation

A finance company has given a large number of car loans. It needs more money so that it is in a position to give more loans. One way to achieve this is to sell all the existing loans. But, in the absence of a liquid secondary market for individual car loans, this is not feasible.

However, a practical option is debt securitisation, in which the finance company sells its existing car loans already given to borrowers to the Special Purpose Vehicle (SPV). The SPV, in return pays to the company, which in turn continues to lend with this money. On the other hand, the SPV pools these loans and converts these into marketable securities. It means that now these converted securities can be issued to investors.

So, this process of debt securitization helps the finance company to raise funds and get the loans off its Balance Sheet. These funds also help the company disburse further loans. Similarly, the process is beneficial to the investors also as it creates a liquid investment in a diversified pool of car loans, which may be an attractive option to other fixed income instruments. The whole process is carried out in such a way that the original debtors i.e. the car loan borrowers may not be aware of the transaction. They might have continued making payments the way they are already doing. However, these payments shall now be made to the new investors who have emerged out of this securitization process.



6. LEASE FINANCING

Leasing is a general contract between the owner and user of the asset over a specified period of time. The asset is purchased initially by the lessor (leasing company) and thereafter leased to the user (lessee company) which pays a specified rent at periodical intervals. Thus, leasing is an alternative to the purchase of an asset out of own or borrowed funds. Moreover, lease finance can be arranged much faster as compared to term loans from financial institutions.

6.1 Types of Lease Contracts

Broadly lease contracts can be divided into following two categories:

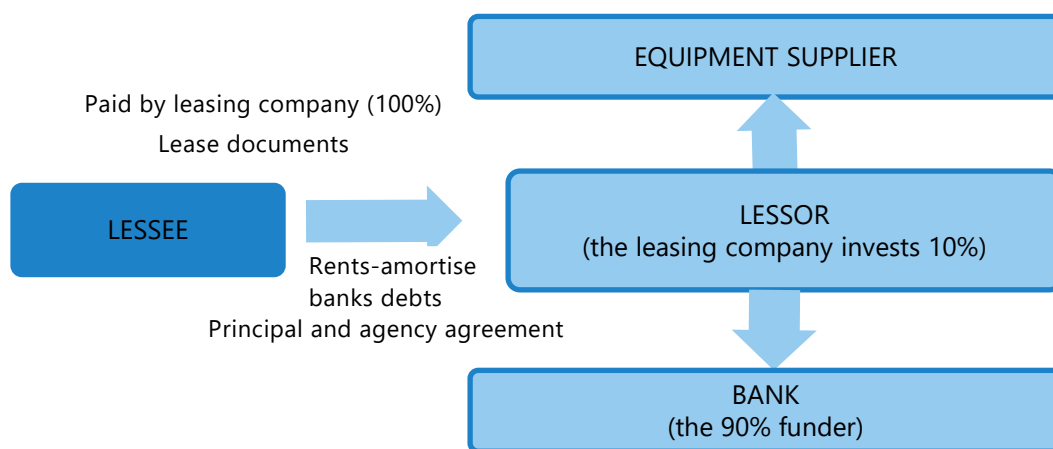
(a) Operating Lease (b) Financial Lease

(a) Operating Lease: An operating lease is a form of lease in which the right to use the asset is given by the lessor to the lessee. However, the ownership right of the asset remains with the lessor. The lessee gives a fixed amount of periodic lease rentals to the lessor for using the asset. Further, the lessor also bears the insurance, maintenance and repair costs etc. of the asset.

In operating lease, the lease period is short. So, the lessor may not be able to recover the cost of the asset during the initial lease period and tend to lease the asset to more than one lessee. Normally, these are callable lease and are cancelable with proper notice.

The term of this type of lease is shorter than the asset's economic life. The lessee is obliged to make payment until the lease expiration, which approaches useful life of the asset.

An operating lease is particularly attractive to companies that continually update or replace equipment and want to use equipment without ownership, but also want to return equipment at lease end and avoid technological obsolescence.



Note: The above diagram may be summarized in a short paragraph.

- (b) Financial Lease:** In contrast to an operating lease, a financial lease is long term in nature and non-cancelable i.e. the lessee cannot terminate the lease agreement subsequently. So, the period of lease is generally the full economic life of the leased asset. In other words, a financial lease can be regarded as any leasing arrangement that is to finance the use of equipment for the major parts of its useful life. The lessee has the right to use the equipment while the lessor retains legal title. Further, in such lease, the lessee has to bear the insurance, maintenance and other related costs. It is also called capital lease, which is nothing but a loan in disguise.

Thus, it can be said that a financial lease is a contract involving payments over an obligatory period of specified sums sufficient in total to amortise the capital outlay of the lessor and give some profit.

Comparison between Financial Lease and Operating Lease

Financial Lease		Operating Lease
1.	The risk and reward incident to ownership are passed on to the lessee. The lessor only remains the legal owner of the asset.	The lessee is only provided the use of the asset for a certain time. Risk incident to ownership belong wholly to the lessor.
2.	The lessee bears the risk of obsolescence.	The lessor bears the risk of obsolescence.
3.	The lessor is interested in his rentals and not in the asset. He must get his principal back along with interest. Therefore, the lease is non-cancellable by either party.	As the lessor does not have difficulty in leasing the same asset to other willing lessee, the lease is kept cancelable by the lessor.
4.	The lessor enters into the transaction only as financier. He does not bear the cost of repairs, maintenance or operations.	Usually, the lessor bears cost of repairs, maintenance or operations.

5.	The lease is usually full payout, that is, the single lease repays the cost of the asset together with the interest.	The lease is usually non-payout, since the lessor expects to lease the same asset over and over again to several users.
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6.2 Other Types of Leases

- (a) **Sales and Lease Back:** Under this type of lease, the owner of an asset sells the asset to a party (the buyer), who in turn leases back the same asset to the owner in consideration of a lease rentals. Under this arrangement, the asset is not physically exchanged but it all happen in records only. The main advantage of this method is that the lessee can satisfy himself completely regarding the quality of an asset and after possession of the asset convert the sale into a lease agreement.

Under this transaction, the seller assumes the role of lessee (as the same asset which he has sold came back to him in the form of lease) and the buyer assumes the role of a lessor (as asset purchased by him was leased back to the seller). So, the seller gets the agreed selling price and the buyer gets the lease rentals.

- (b) **Leveraged Lease:** Under this lease, a third party is involved besides lessor and the lessee. The lessor borrows a part of the purchase cost (say 80%) of the asset from the third party i.e., lender and asset so purchased is held as security against the loan. The lender is paid off from the lease rentals directly by the lessee and the surplus after meeting the claims of the lender goes to the lessor. The lessor is entitled to claim depreciation allowance.
- (c) **Sales-aid Lease:** Under this lease contract, the lessor enters into a tie up with a manufacturer for marketing the latter's product through his own leasing operations, it is called a sales-aid lease. In consideration of the aid in sales, the manufacturer may grant either credit or a commission to the lessor. Thus, the lessor earns from both sources i.e. from lessee as well as the manufacturer.
- (d) **Close-ended and Open-ended Leases:** In the close-ended lease, the assets get transferred to the lessor at the end of lease, the risk of obsolescence, residual value etc., remain with the lessor being the legal owner of the asset.

In the open-ended lease, the lessee has the option of purchasing the asset at the end of the lease period.

In recent years, leasing has become a popular source of financing in India. From the lessee's point of view, leasing has the attraction of eliminating immediate cash outflow, and the lease rentals can be deducted for computing the total income under the Income tax Act. As against this, buying has the advantages of depreciation allowance (including additional depreciation) and interest on borrowed capital being tax-deductible. Thus, an evaluation of the two alternatives is to be made in order to take a decision. Practical problems for lease financing are covered at Final level in paper - Financial Services and Capital Markets.



7. SHORT-TERM SOURCES OF FINANCE

There are various sources available to meet short-term needs of finance. The different sources are discussed below:

- (i) **Trade Credit:** It represents credit granted by suppliers of goods, etc., as an incident of sale. The usual duration of such credit is 15 to 90 days. It generates automatically in the course of business and is common to almost all business operations. It can be in the form of an 'open account' or 'bills payable'.

Trade credit is preferred as a source of finance because it is without any explicit cost and till a business is a going concern it keeps on rotating. Another very important characteristic of trade credit is that it enhances automatically with the increase in the volume of business.

- (ii) **Accrued Expenses and Deferred (Unearned) Income:** Accrued expenses represent liabilities which a company has to pay for the services which it has already received like wages, taxes, interest and dividends. Such expenses arise out of the day-to-day activities of the company and hence represent a spontaneous source of finance.

Deferred income, on the other hand, reflects the amount of funds received by a company in lieu of goods and services to be provided in the future. Since these receipts increase a company's liquidity, they are also considered to be an important source of spontaneous finance.

- (iii) **Advances from Customers:** Manufacturers and contractors engaged in producing or constructing costly goods involving considerable length of manufacturing or construction time usually demand advance money from their customers at the time of accepting their orders for executing their contracts or supplying the goods. This is a cost free source of finance and really useful.
- (iv) **Commercial Paper:** A Commercial Paper is an unsecured money market instrument issued in the form of a promissory note. The Reserve Bank of India introduced the commercial paper scheme in the year 1989 with a view to enabling highly rated corporate borrowers to diversify their sources of short-term borrowings and to provide an additional instrument to investors. Subsequently, in addition to the Corporate, Primary Dealers and All India Financial Institutions have also been allowed to issue Commercial Papers. Commercial papers are issued in denominations of ₹ 5 lakhs or multiples thereof and the interest rate is generally linked to the yield on the one-year government bond.

All eligible issuers are required to get the credit rating from Credit Rating Information Services of India Ltd, (CRISIL), or the Investment Information and Credit Rating Agency of India Ltd (ICRA) or the Credit Analysis and Research Ltd (CARE) or the FITCH Ratings India Pvt. Ltd or any such other credit rating agency as is specified by the Reserve Bank of India.

- (v) **Treasury Bills:** Treasury bills are a class of Central Government Securities. Treasury bills, commonly referred to as T-Bills are issued by Government of India to meet short term borrowing requirements with maturities ranging between 14 to 364 days.
- (vi) **Certificates of Deposit (CD):** The certificate of deposit is a document of title similar to a time deposit receipt with a fixed maturity date of not less than 7 days up to a maximum of one year issued by a bank except that there is no prescribed interest rate on such funds.

The main advantage of CD is that banker is not required to encash the deposit before maturity period and the investor is assured of liquidity because he can sell the CD in secondary market.

(vii) **Bank Advances:** Banks receive deposits from public for different periods at varying rates of interest. These funds are invested and lent in such a manner that when required, they may be called back. Lending results in gross revenues out of which costs, such as interest on deposits, administrative costs, etc., are met and a reasonable profit is made. A bank's lending policy is not merely profit motivated but has to also keep in mind the socio-economic development of the country.

Some of the facilities provided by banks are:

- (a) **Short Term Loans:** In a loan account, the entire advance is disbursed at one time either in cash or by transfer to the current account of the borrower. It is a single advance and given against securities like shares, government securities, life insurance policies and fixed deposit receipts, etc. Except by way of interest and other charges, no further adjustments are made in this account. Repayment under the loan account is made either by way of repaying the full amount or by way of schedule of repayments agreed upon as in case of term loans.
- (b) **Overdraft:** Under this facility, customers are allowed to withdraw in excess of credit balance standing in their Current Account. A fixed limit is, therefore, granted to the borrower within which the borrower is allowed to overdraw his account. Though overdrafts are repayable on demand, they generally continue for long periods by annual renewals of the limits. This is a convenient arrangement for the borrower as he is in a position to avail the limit sanctioned, according to his requirements. Interest is charged on daily balances.

Since these accounts are operated in the same way as cash credit and current accounts, cheque books are provided.

- (c) **Clean Overdrafts:** Request for clean advances are entertained only from parties which are financially sound and having reputation for their integrity. The bank has to rely upon the personal security of the borrowers. Therefore, while entertaining proposals for clean advances; banks exercise a good deal of restraint since they have no backing of any tangible security. If the parties are already enjoying secured advance facilities, this may be a point in favor and may be taken into account while screening such proposals. The amount of turnover in the

account, satisfactory dealings for considerable period and reputation in the market are some of the factors which the bank normally see. As a safeguard, banks take guarantees from other persons who are credit worthy before granting this facility. A clean advance is generally granted for a short period and must not be continued for long.

- (d) **Cash Credits:** Cash Credit is an arrangement under which a customer is allowed an advance up to certain limit against credit granted by bank. Under this arrangement, a customer need not borrow the entire amount of advance at one time; he can only draw to the extent of his requirements and deposit his surplus funds in his account. Interest is not charged on the full amount of the advance but on the amount actually availed by him.

Generally, cash credit limits are sanctioned against the security of tradable goods by way of pledge or hypothecation. Though these accounts are repayable on demand, banks usually do not recall such advances, unless they are compelled to do so by adverse factors.

- (e) **Advances against goods:** Advances against goods occupy an important place in total bank credit. They provide a reliable source of repayment. Advances against them are safe and liquid. Also, there is a quick turnover in goods, as they are in constant demand. So a banker generally accepts them as security. Furthermore, goods are charged to the bank either by way of pledge or by way of hypothecation. The term 'goods' includes all forms of movables which are offered to the bank as security. They may be agricultural commodities or industrial raw materials or partly finished goods.

- (f) **Bills Purchased/ Discounted:** Under this head, banks give advances against the security of bills which may be clean or documentary. Bills are sometimes purchased from approved customers in whose favour limits are sanctioned. Before granting a limit, the banker satisfies himself as to the credit worthiness of the drawer (the one who prepared the bill of exchange, i.e. the creditor or the beneficiary or the payee). Although the term 'bills purchased' gives the impression that the bank becomes the owner or purchaser of such bills, in actual practice the bank holds the bills only as security for the advance. The bank, in

addition to the rights against the parties liable on the bills, can also exercise a pledge's rights over the goods covered by the documents.

[Some forms of bank credit are also discussed in Chapter -9 (Management of Working Capital), Students are advised to also refer the same]

(viii) Financing of Export Trade by Banks: Exports play an important role in accelerating the economic growth of developing countries like India. Out of the several factors influencing export growth, credit is a very important factor which enables exporters in efficiently executing their export orders. The commercial banks provide short-term export finance mainly by way of pre and post-shipment credit. Export finance is granted in Rupees as well as in foreign currency.

In view of the importance of export credit in maintaining the pace of export growth, RBI has initiated several measures in the recent years to ensure timely and hassle-free flow of credit to the export sector. These measures, inter alia, include rationalization and liberalization of export credit interest rates, flexibility in repayment/prepayment of pre-shipment credit, special financial package for large value exporters, export finance for agricultural exports, Gold Card Scheme for exporters etc. Further, banks have been granted freedom by RBI to source funds from abroad without any limit, exclusively for the purpose of granting export credit in foreign currency, which has enabled banks to increase their lending's under export credit in foreign currency substantially during the last few years.

The advances by commercial banks for export financing are in the form of:

- (i) Pre-shipment finance i.e., before shipment of goods.
- (ii) Post-shipment finance i.e., after shipment of goods.
- (i) Pre-Shipment Finance:** This generally takes the form of packing credit facility; packing credit is an advance extended by banks to an exporter for the purpose of buying, manufacturing, processing, packing, shipping goods to overseas buyers. Any exporter, having at hand a firm export order placed with him by his foreign buyer or an irrevocable letter of credit opened in his favour, can approach a bank for availing of packing credit. An advance so taken by an exporter is required to be

liquidated within 180 days from the date of its commencement by negotiation of export bills or receipt of export proceeds in an approved manner. Thus, packing credit is essentially a short-term advance.

Normally, banks insist upon their customers to lodge with them irrevocable letters of credit opened in favour of the customers by the overseas buyers. The letter of credit and firm sale contracts not only serve as evidence of a definite arrangement for realisation of the export proceeds but also indicate the amount of finance required by the exporter. Packing credit, in the case of customers of long standing, may also be granted against firm contracts entered into by them with overseas buyers.

Types of Packing Credit

- (a) **Clean packing credit:** This is an advance made available to an exporter only on production of a firm export order or a letter of credit without exercising any charge or control over raw material or finished goods. It is a clean type of export advance. Each proposal is weighed according to particular requirements of the trade and credit worthiness of the exporter. A suitable margin has to be maintained. Also, Export Credit Guarantee Corporation (ECGC) cover should be obtained by the bank.
- (b) **Packing credit against hypothecation of goods:** Export finance is made available on certain terms and conditions where the exporter has pledge able interest and the goods are hypothecated to the bank as security with stipulated margin. At the time of utilising the advance, the exporter is required to submit, along with the firm export order or letter of credit relative stock statements and thereafter continue submitting them every fortnight and/or whenever there is any movement in stocks.
- (c) **Packing credit against pledge of goods:** Export finance is made available on certain terms and conditions where the exportable finished goods are pledged to the banks with approved clearing agents who will ship the same from time to time as required by the exporter. The possession of the goods so pledged lies with the bank and is kept under its lock and key.

- (d) **E.C.G.C. guarantee:** Any loan given to an exporter for the manufacture, processing, purchasing, or packing of goods meant for export against a firm order qualifies for the packing credit guarantee issued by Export Credit Guarantee Corporation.
 - (e) **Forward exchange contract:** Another requirement of packing credit facility is that if the export bill is to be drawn in a foreign currency, the exporter should enter into a forward exchange contract with the bank, thereby avoiding risk involved in a possible change in the rate of exchange.
- (ii) **Post-shipment Finance:** It takes the following forms:
- (a) **Purchase/discounting of documentary export bills:** Finance is provided to exporters by purchasing export bills drawn payable at sight or by discounting usance export bills covering confirmed sales and backed by documents including documents of the title of goods such as bill of lading, post parcel receipts, or air consignment notes.
 - (b) **E.C.G.C. Guarantee:** Post-shipment finance, given to an exporter by a bank through purchase, negotiation or discount of an export bill against an order, qualifies for post-shipment export credit guarantee. It is necessary, however, that exporters should obtain a shipment or contracts risk policy of E.C.G.C. Banks insist on the exporters to take a contracts shipments (comprehensive risks) policy covering both political and commercial risks. The Corporation, on acceptance of the policy, will fix credit limits for individual exporters and the Corporation's liability will be limited to the extent of the limit so fixed for the exporter concerned irrespective of the amount of the policy.
 - (c) **Advance against export bills sent for collection:** Finance is provided by banks to exporters by way of advance against export bills forwarded through them for collection, taking into account the creditworthiness of the party, nature of goods exported, usance, standing of drawee etc.

- (d) **Advance against duty draw backs, cash subsidy, etc.:** To finance export losses sustained by exporters, bank advance against duty draw-back, cash subsidy etc., receivable by them against export performance. Such advances are of clean nature; hence necessary precaution should be exercised.

Bank providing finance in this manner see that the relative export bills are either negotiated or forwarded for collection through it so that it is in a position to verify the exporter's claims for duty draw-backs, cash subsidy, etc. 'An advance so availed of by an exporter is required to be liquidated within 180 days from the date of shipment of relative goods.

Other facilities extended to the exporters are as follows:

- (i) On behalf of approved exporters, banks establish letters of credit on their overseas or up country suppliers.
 - (ii) Guarantees for waiver of excise duty, etc. due performance of contracts, bond in lieu of cash security deposit, guarantees for advance payments etc., are also issued by banks to approved clients.
 - (iii) To approved clients undertaking exports on deferred payment terms, banks also provide finance.
 - (iv) Banks also endeavour to secure for their exporter-customers status reports of their buyers and trade information on various commodities through their correspondents.
 - (v) Economic intelligence on various countries is also provided by banks to their exporter clients.
- (ix) **Inter Corporate Deposits:** The companies can borrow funds for a short period, say 6 months, from other companies which have surplus liquidity. The rate of interest on inter corporate deposits varies depending upon the amount involved and the time period.
- (x) **Public Deposits:** Public deposits are very important source of short-term and medium term finances particularly due to credit squeeze by the Reserve Bank of India. A company can accept public deposits subject to the stipulations of Reserve Bank of India from time to time upto a maximum amount of 35 per cent of its paid up capital and reserves.. These deposits may be accepted for

a period of six months to three years. Public deposits are unsecured loans; they should not be used for acquiring fixed assets since they are to be repaid within a period of 3 years. These are mainly used to finance working capital requirements.



8. OTHER SOURCES OF FINANCING

- (i) **Seed Capital Assistance:** The Seed Capital Assistance scheme is designed by IDBI for professionally or technically qualified entrepreneurs and/or persons possessing relevant experience, skills and entrepreneurial traits but lack adequate financial resources. All the projects eligible for financial assistance from IDBI, directly or indirectly through refinance are eligible under the scheme.

The Seed Capital Assistance is interest free but carries a service charge of one per cent per annum for the first five years and at increasing rate thereafter. However, IDBI will have the option to charge interest at such rate as may be determined by IDBI on the loan if the financial position and profitability of the company so permits during the currency of the loan. The repayment schedule is fixed depending upon the repaying capacity of the unit with an initial moratorium up-to five years.

- (ii) **Internal Cash Accruals:** Existing profit-making companies which undertake an expansion/ diversification programme may be permitted to invest a part of their accumulated reserves or cash profits for creation of capital assets. In such cases, past performance of the company permits the capital expenditure from within the company by way of disinvestment of working/invested funds. In other words, the surplus generated from operations, after meeting all the contractual, statutory and working requirement of funds, is available for further capital expenditure.
- (iii) **Unsecured Loans:** Unsecured loans are typically provided by promoters to meet the promoters' contribution norm. These loans are subordinate to institutional loans. The rate of interest chargeable on these loans should be less than or equal to the rate of interest on institutional loans and interest can be paid only after payment of institutional dues. These loans cannot be

repaid without the prior approval of financial institutions. Unsecured loans are considered as part of the equity for the purpose of calculating debt equity ratio.

- (iv) **Deferred Payment Guarantee:** Many a time suppliers of machinery provide deferred credit facility under which payment for the purchase of machinery can be made over a period of time. The entire cost of the machinery is financed and the company is not required to contribute any amount initially towards acquisition of the machinery. Normally, the supplier of machinery insists that bank guarantee should be furnished by the buyer. Such a facility does not have a moratorium period for repayment. Hence, it is advisable only for an existing profit-making company.
- (v) **Capital Incentives:** The backward area development incentives available often determine the location of a new industrial unit. These incentives usually consist of a lump sum subsidy and exemption from or deferment of sales tax and octroi duty. The quantum of incentives is determined by the degree of backwardness of the location.

The special capital incentive in the form of a lump sum subsidy is a quantum sanctioned by the implementing agency as a percentage of the fixed capital investment subject to an overall ceiling. This amount forms a part of the long-term means of finance for the project. However, it may be mentioned that the viability of the project must not be dependent on the quantum and availability of incentives. Institutions, while appraising the project, assess the viability of the project per se, without considering the impact of incentives on the cash flows and profitability of the project.

Special capital incentives are sanctioned and released to the units only after they have complied with the requirements of the relevant scheme. The requirements may be classified into initial effective steps and final effective steps.

- (vi) **Deep Discount Bonds:** Deep Discount Bonds is a form of zero-interest bonds. These bonds are sold at a discounted value and on maturity, face value is paid to the investors. In such bonds, there is no interest payout during lock in period.
- (vii) **Secured Premium Notes:** Secured Premium Notes is issued along with a detachable warrant and is redeemable after a notified period of say 4 to 7 years. The conversion of detachable warrant into equity shares will have to be done within time period notified by the company.

- (viii) **Zero Interest Fully Convertible Debentures:** These are fully convertible debentures which do not carry any interest. The debentures are compulsorily and automatically converted after a specified period of time and holders thereof are entitled to new equity shares of the company at predetermined price. From the point of view of company, this kind of instrument is beneficial in the sense that no interest is to be paid on it. If the share price of the company in the market is very high then the investors tends to get equity shares of the company at the lower rate.
- (ix) **Zero Coupon Bonds:** A Zero Coupon Bond does not carry any interest but it is sold by the issuing company at a discount. The difference between the discounted value and maturing or face value represents the interest to be earned by the investor on such bonds.
- (x) **Option Bonds:** These are cumulative and non-cumulative bonds where interest is payable on maturity or periodically. Redemption premium is also offered to attract investors.
- (xi) **Inflation Bonds:** Inflation Bonds are the bonds in which interest rate is adjusted for inflation. Thus, the investor gets interest which is free from the effects of inflation. For example, if the interest rate is 11 per cent and the inflation is 5 per cent, the investor will earn 16 per cent meaning thereby that the investor is protected against inflation.
- (xii) **Floating Rate Bonds:** This as the name suggests is bond where the interest rate is not fixed and is allowed to float depending upon the market conditions. This is an ideal instrument which can be resorted to by the issuer to hedge themselves against the volatility in the interest rates. This has become more popular as a money market instrument and has been successfully issued by financial institutions like IDBI, ICICI etc.
- (xiii) **High Yield Bonds (or Junk Bonds):** Junk Bond is a bond that is rated below investment grade by credit rating agencies. It has a low credit rating and a high risk of default. Because of the higher risk, investors are compensated with higher interest rates, which is why junk bonds are also called high-yield bonds.



9. INTERNATIONAL FINANCING

The essence of financial management is to raise and utilise the funds raised effectively. There are various avenues for organisations to raise funds either through internal or external sources. The sources of external financing include:

- (i) **Commercial Banks:** Like domestic loans, commercial banks all over the world extend Foreign Currency (FC) loans also for international operations. These banks also provide to overdraw over and above the loan amount.
- (ii) **Development Banks:** Development banks offer long & medium term loans including FC loans. Many agencies at the national level offer a number of concessions to foreign companies to invest within their country and to finance exports from their countries e.g. EXIM Bank of USA.
- (iii) **Discounting of Trade Bills:** This is used as a short-term financing method. It is used widely in Europe and Asian countries to finance both domestic and international business.
- (iv) **International Agencies:** A number of international agencies have emerged over the years to finance international trade & business. The more notable among them include The International Finance Corporation (IFC), The International Bank for Reconstruction and Development (IBRD), The Asian Development Bank (ADB), The International Monetary Fund (IMF), etc.
- (v) **International Capital Markets:** Today, modern organisations including MNC's depend upon sizeable borrowings in Rupees as well as Foreign Currency (FC). In order to cater to the needs of such organisations, international capital markets have sprung all over the globe such as in London.

In international capital market, the availability of FC is available under the four main systems viz:

- Euro-currency market
- Export credit facilities
- Bonds issues
- Financial Institutions

The origin of the Euro-currency market was with the dollar denominated bank deposits and loans in Europe particularly in London. Euro-dollar deposits are dollar denominated time deposits available at foreign branches of US banks and at some foreign banks. Banks based in Europe accept dollar denominated deposits and make dollar denominated deposits to the clients. This forms the backbone of the Euro-currency market all over the globe. In this market, funds are made available as loans through syndicated Euro-credit of instruments such as FRN's, FR certificates of deposits.

(vi) Financial Instruments: Some of the various financial instruments dealt with in the international market are briefly described below:

(a) External Commercial Borrowings (ECB): ECBs refer to commercial loans (in the form of bank loans, buyers credit, suppliers credit, securitised instruments (e.g. floating rate notes and fixed rate bonds) availed from non-resident lenders with minimum average maturity of 3 years. Borrowers can raise ECBs through internationally recognised sources like (i) international banks, (ii) international capital markets, (iii) multilateral financial institutions such as the IFC, ADB etc, (iv) export credit agencies, (v) suppliers of equipment, (vi) foreign collaborators and (vii) foreign equity holders.

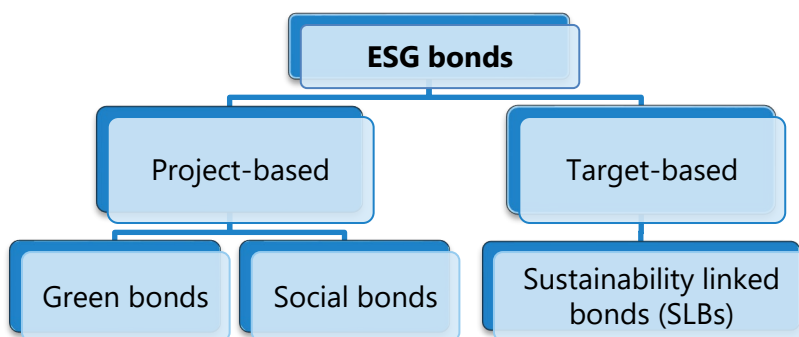
External Commercial Borrowings can be accessed under two routes viz (i) Automatic route and (ii) Approval route. Under the Automatic route, there is no need to take the RBI/Government approval whereas such approval is necessary under the Approval route. Company's registered under the Companies Act and NGOs engaged in micro finance activities are eligible for the Automatic Route whereas Financial Institutions and Banks dealing exclusively in infrastructure or export finance and the ones which had participated in the textile and steel sector restructuring packages as approved by the government are required to take the Approval Route.

(b) Euro Bonds: Euro bonds are debt instruments which are not denominated in the currency of the country in which they are issued e.g. a Yen note floated in Germany. Such bonds are generally issued in a bearer form rather than as registered bonds and in such cases they

do not contain the investor's names or the country of their origin. These bonds are an attractive proposition to investors seeking privacy.

- (c) **Foreign Bonds:** These are debt instruments issued by foreign corporations or foreign governments. Such bonds are exposed to default risk, especially the corporate bonds. These bonds are denominated in the currency of the country where they are issued, however, in case these bonds are issued in a currency other than the investors home currency, they are exposed to exchange rate risks. An example of a foreign bond 'A British firm placing Dollar denominated bonds in USA'.
- (d) **Fully Hedged Bonds:** As mentioned above, in foreign bonds, the risk of currency fluctuations exists. Fully hedged bonds eliminate the risk by selling in forward markets the entire stream of principal and interest payments.
- (e) **Medium Term Notes (MTN):** Certain issuers need frequent financing through the Bond route including that of the Euro bond. However, it may be costly and ineffective to go in for frequent issues. Instead, investors can follow the MTN programme. Under this programme, several lots of bonds can be issued, all having different features e.g. different coupon rates, different currencies etc. The timing of each lot can be decided keeping in mind the future market opportunities. The entire documentation and various regulatory approvals can be taken at one point of time.
- (f) **Floating Rate Notes (FRN):** These are issued up to seven years maturity. Interest rates are adjusted to reflect the prevailing exchange rates. They provide cheaper money than foreign loans.
- (g) **Euro Commercial Papers (ECP):** ECPs are short term money market instruments. They have maturity period of less than one year. They are usually designated in US Dollars.
- (h) **Foreign Currency Option (FC):** A FC Option is the right (and not the obligation) to buy or sell, foreign currency at a certain specified price on or before a specified date. It provides a hedge against financial and economic risks.

- (i) **Foreign Currency Futures:** FC Futures are obligations (and not the right) to buy or sell a specified foreign currency in the present for settlement at a future date.
- (j) **Foreign Euro Bonds:** In domestic capital markets of various countries the Bonds issues referred to above are known by different names such as Yankee Bonds in the US, Swiss Francs in Switzerland, Samurai Bonds in Tokyo and Bulldogs in UK.
- (k) **Euro Convertible Bonds:** A convertible bond is a debt instrument which gives the holders of the bond an option to convert the bonds into a pre-determined number of equity shares of the company. Usually the price of the equity shares at the time of conversion will have a premium element. These bonds carry a fixed rate of interest and if the issuer company so desires may also include a Call Option (where the issuer company has the option of calling/ buying the bonds for redemption prior to the maturity date) or a Put Option (which gives the holder the option to put/sell his bonds to the issuer company at a pre-determined date and price).
- (l) **Euro Convertible Zero Bonds:** These bonds are structured as a convertible bond. No interest is payable on the bonds. But conversion of bonds takes place on maturity at a pre- determined price. Usually there is a five years maturity period and they are treated as a deferred equity issue.
- (m) **Euro Bonds with Equity Warrants:** These bonds carry a coupon rate determined by market rates. The warrants are detachable. Pure bonds are traded at a discount. Fixed Income Funds Management may like to invest for the purposes of regular income in this case.
- (n) **Environmental, Social and Governance-linked bonds (ESG):** These bonds carry a responsibility of the issuer company to prioritize optimal environmental, social and governance (ESG) factors. Investing in ESG bonds is considered as **socially responsible investing**. ESG bonds can be project-based - green bonds and social bonds; and target-based - sustainability-linked bonds (SLBs).



- ◆ **Green bonds:** These are the most popular ESG bonds that are issued by a financial, non-financial or public institution, where the bond proceeds are used to finance “green projects”. Green projects are aimed at positive environmental and/or climate impact including the cultivation of eco-friendly technology. India is the second-largest green bond market. For example: Ghaziabad Municipal Corporation (GMC) becomes the first Municipal Corporation to raise ₹ 150 crore from Green Bond in the Year 2021.
- ◆ **Social bonds:** These bonds finance the socially impactful projects. The projects here are related to the social concerns such as Human rights, Equality, animal welfare etc. For example, “Vaccine bonds” are social bonds, issued to fund the vaccination of vulnerable childrens and protection of people in lower income countries.
- ◆ **Sustainability-linked bonds (SLBs):** These bonds are combination of green bonds and social bonds. Proceeds of SLBs are not meant for a specific project but for general corporate purpose to achieve Key Performance Indicator (KPIs). For example: UltraTech Cement raises US\$ 400 million through India’s first sustainability-linked bonds in year 2021. The company aims to reduce carbon emissions through the life of bond of 10 years.

(vii) Euro Issues by Indian Companies: Euro issuance refers to the sources of funding or capital that can be accessed to raise money outside the home country in foreign currency. Indian companies are permitted to raise foreign currency resources through issue of ordinary equity shares through Global Depository Receipts (GDRs)/ American Depository Receipts (ADRs) and / or

issue of Foreign Currency Convertible Bonds (FCCB) to foreign investors i.e. institutional investors or individuals (including NRIs) residing abroad. Such investment is treated as Foreign Direct Investment (FDI). The government guidelines on these issues are covered under the Foreign Currency Convertible Bonds and Ordinary Shares (through depositary receipt mechanism) Scheme, 1993 and notifications issued after the implementation of the said scheme.

- (a) **American Depositary Receipts (ADRs):** These are securities offered by **non-US companies who want to list on any of the US exchange**. Each ADR represents a certain number of a company's regular shares. ADRs allow US investors to buy shares of these companies without the costs of investing directly in a foreign stock exchange.

The Indian companies have preferred the GDRs to ADRs because the US market exposes them to a higher level of responsibility than a European listing in the areas of disclosure, costs, liabilities and timing. The regulations are somewhat more stringent and onerous, even for companies already listed and held by retail investors in their home country. The most onerous aspect of a US listing for the companies is to provide full, half yearly and quarterly accounts in accordance with, or at least reconciled with US GAAPs.

- (b) **Global Depositary Receipts (GDRs):** These are negotiable certificates held in the bank of one country representing a **specific number of shares of a stock traded on the exchange of another country**. These financial instruments are used by companies to raise capital in either dollars or Euros. These are mainly traded in European countries and particularly in London.

ADRs/GDRs and the Indian Scenario: Indian companies are shedding their reluctance to tap the US markets. Infosys Technologies was the first Indian company to be listed on Nasdaq in 1999. However, the first Indian firm to issue sponsored GDR or ADR was Reliance industries Limited. Beside these two companies there are several other Indian firms which are also listed in the overseas bourses. These are Wipro, MTNL, State Bank of India, Tata Motors, Dr. Reddy's Lab, etc.

- (c) **Indian Depository Receipts (IDRs):** The concept of **the depository receipt mechanism which is used to raise funds in foreign currency** has been applied in the Indian Capital Market through the issue of Indian Depository Receipts (IDRs). IDRs are similar to ADRs/GDRs in the sense that foreign companies can issue IDRs to raise funds from the Indian Capital Market in the same lines as an Indian company uses ADRs/GDRs to raise foreign capital. The IDRs are listed and traded in India in the same way as other Indian securities are traded.



10. CONTEMPORARY SOURCES OF FUNDING

- (i) **Crowd funding:** In simple terms, crowdfunding means raising money for an individual or organisation from a group of people to fund a project, typically via internet (social media and crowdfunding websites). It generally involves collecting funds from family, friends, strangers, corporates and many more in exchange of equity (known as Equity funding), loans (known as P2P lending) or nothing at all (i.e. donation). This source of funding also helps start-up to substantiate demand for their product before entering into production.

In the crowdfunding process, three parties are involved i.e. fund raiser, mediator and fund investor. The platforms (mediator) may also charge certain fees in the form of processing fee, transaction fee, etc. either as a fixed amount or a percentage or in combination of both.

- (ii) **Equity funding:** Equity crowdfunding is a mechanism where investor invests money in an organisation and receive securities of that organisation in return. Every investor would be entitled to a stake in the organisation depending on their investment. The digital nature of crowdfunding targets large number of investors with small contributions. This type of funding is mostly adopted by startups. Some of the platforms offering equity crowdfunding are StartEngine, EquityNet, SeedInvest, etc.
- (iii) **Peer-to-Peer (P2P) lending:** It is that category of crowdfunding where lenders match with the borrowers in order to provide unsecured loans through online platform. The fund raised are paid back by the borrowers with interest, though this kind of lending involves certain risk of defaults (just as the banks bear in the case of conventional method of lending). Anyone interested in investing money under P2P lending can visit the P2P lending

platforms and choose amongst borrowers considering risk & returns. Some of the platforms offering P2P lending are i2iFunding, Lendbox, Faircent, RupeeCircle, etc.

- (iv) **Start-up funding:** A start-up company being newly formed needs fund before starting any project. However, as a start-up, it is difficult to manage loans from bank, leaving crowdfunding as one of the sources of finance. Through crowdfunding, a start-up company can raise money from large group of people. The crowdfunding may be in the form of equity funding, P2P lending or both.
- (v) **Donation-based Crowdfunding:** It is a source of finance where large group of people donate money as a charity for some cause with no expectation of any ownership or debt. Some of the platforms that are used for donation-based crowdfunding are GoFundMe (used for donations against medical needs, education, etc.), Ketto (used for donation against medical needs), FuelADream (used for donation against charity projects, new ideas), etc.

SUMMARY

- ◆ There are several sources of finance/funds available to any company.
- ◆ All the financial needs of a business may be grouped into the long term or short-term financial needs.
- ◆ There are different sources of funds available to meet long term financial needs of the business. These sources may be broadly classified into share capital (both equity and preference) and debt.
- ◆ Another important source of long-term finance is venture capital financing. It refers to financing of new high risky venture promoted by qualified entrepreneurs who lack experience and funds to give shape to their ideas.
- ◆ Debt Securitisation is another important source of finance and it is a process in which illiquid assets are pooled into marketable securities that can be sold to investors.
- ◆ Leasing is a very popular source to finance equipment. It is a contract between the owner and user of the asset over a specified period of time in which the asset is purchased initially by the lessor (leasing company) and thereafter

leased to the user (lessee company) who pays a specified rent at periodical intervals.

- ◆ Some of the short terms sources of funding are trade credit, advances from customers, commercial paper, and bank advances etc.
- ◆ To support export, the commercial banks provide short term export finance mainly by way of pre and post-shipment credit.
- ◆ Every day new creative financial products keep on entering the market. Some of the examples are seed capital assistance, option bonds, inflation bonds, masala bonds etc.
- ◆ Today, the businesses are allowed to source funds from international market also. Some of important products of international financing are External Commercial Borrowings (ECB), ESG-linked bonds, Euro Bonds etc.

TEST YOUR KNOWLEDGE

Multiple Choice Questions (MCQs)

1. *Equity shares:*
 - (a) *Have an unlimited life, and voting rights and receive dividends*
 - (b) *Have a limited life, with no voting rights but receive dividends*
 - (c) *Have a limited life, and voting rights and receive dividends*
 - (d) *Have an unlimited life, and voting rights but receive no dividends*
2. *External sources of finance do not include:*
 - (a) *Debentures*
 - (b) *Retained earnings*
 - (c) *Overdrafts*
 - (d) *Leasing*
3. *Internal sources of finance do not include:*
 - (a) *Better management of working capital*
 - (b) *Ordinary shares*

- (c) *Retained earnings*
 - (d) *Reserve and Surplus*
4. *In preference shares:*
- (a) *Dividends are not available*
 - (b) *Limited voting rights are available*
 - (c) *Are not part of a company's share capital*
 - (d) *Interest can be received*
5. *A debenture:*
- (a) *Is a long-term loan*
 - (b) *Does not require security*
 - (c) *Is a short-term loan*
 - (d) *Receives dividend payments*
6. *Debt capital refers to:*
- (a) *Money raised through the sale of shares.*
 - (b) *Funds raised by borrowing that must be repaid.*
 - (c) *Factoring accounts receivable.*
 - (d) *Inventory loans.*
7. *The most popular source of short-term funding is:*
- (a) *Factoring.*
 - (b) *Trade credit.*
 - (c) *Family and friends.*
 - (d) *Commercial banks.*
8. *Marketable securities are primarily:*
- (a) *short-term debt instruments.*
 - (b) *short-term equity securities.*
 - (c) *long-term debt instruments.*
 - (d) *long-term equity securities.*

9. Which of the following marketable securities is the obligation of a commercial bank?
- (a) Commercial paper
 - (b) Negotiable certificate of deposit
 - (c) Repurchase agreement
 - (d) T-bills
10. Reserves & Surplus are which form of financing?
- (a) Security Financing
 - (b) Internal Financing
 - (c) Loans Financing
 - (d) International Financing
11. With reference to 'IFC Masala Bonds', which of the statements given below is/are correct?
- 1. The International Finance Corporation, which offered these bonds, is an arm of the World Bank.
 - 2. They are rupee-denominated bonds and are a source of debt financing for the public and private sector.
- (a) 1 only
 - (b) 2 only
 - (c) Both 1 and 2
 - (d) Neither 1 nor 2
12. External Commercial Borrowings can be accessed through
- (a) only automatic route
 - (b) only approval route
 - (c) both automatic and approval route
 - (d) neither automatic nor approval route

Theoretical Questions

1. *DESCRIBE the different types of Packing Credit.*
2. *DISCUSS the advantages of raising funds by issue of equity shares.*
3. *EXPLAIN in brief the features of Commercial Paper.*
4. *DISCUSS the features of Secured Premium Notes (SPNs).*
5. *DISCUSS ADRs and GDRs.*
6. *DISTINGUISH between Preference Shares and Debentures.*

ANSWERS

Answers to the MCQs

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

Answers to Theoretical Questions

1. Please refer paragraph 7
2. Please refer paragraph 3.1
3. Please refer paragraph 7
4. Please refer paragraph 8
5. Please refer paragraph 9
6. Please refer paragraph 3.4

FINANCIAL ANALYSIS AND PLANNING— RATIO ANALYSIS

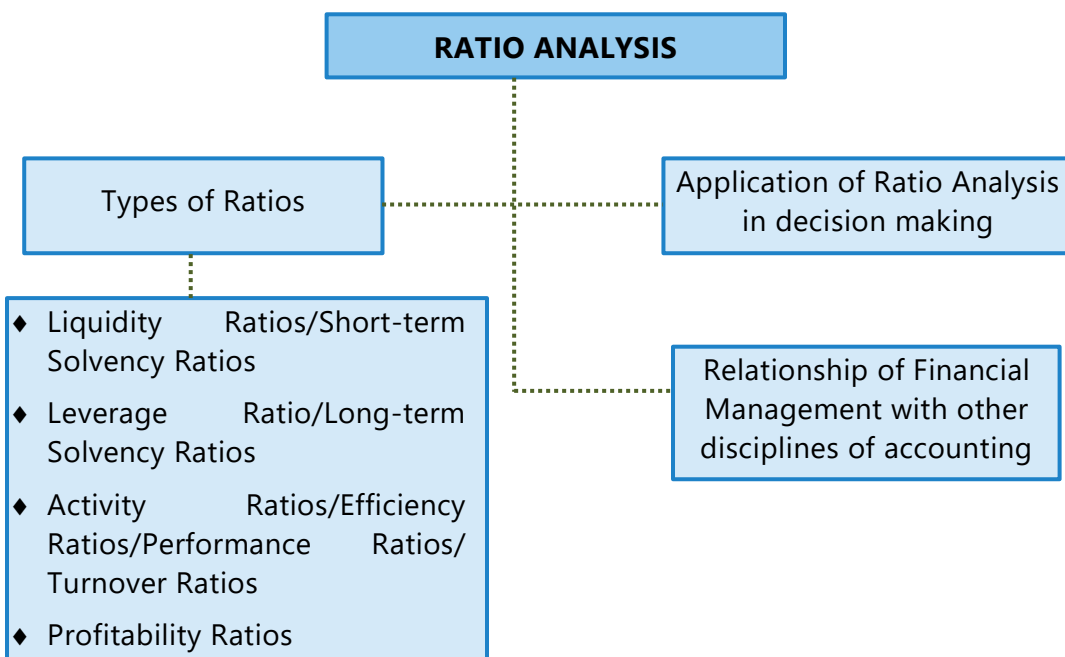


LEARNING OUTCOMES

After studying this chapter, you would be able to -

- ◆ Discuss Sources of financial data for Analysis.
- ◆ Discuss financial ratios and its types.
- ◆ Discuss use of financial ratios to analyse the financial statement.
- ◆ Analyse the ratios from the perspective of investors, lenders, suppliers, managers etc. to evaluate the profitability and financial position of an entity.
- ◆ Describe the users and objective of Financial Analysis - A Birds Eye View
- ◆ Discuss Du Pont analysis.
- ◆ State the limitations of Ratio Analysis.

CHAPTER OVERVIEW



1. INTRODUCTION

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

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

The financial manager has certain analytical tools which help in financial analysis and planning. One of the main tools is Ratio Analysis. Let us discuss the Ratio Analysis in this chapter.



2. RATIO AND RATIO ANALYSIS

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

2.1 Definition of Ratio

A ratio is defined as **“the indicated quotient of two mathematical expressions and as the relationship between two or more things.”** Here, ratio means financial ratio or accounting ratio which is a mathematical expression of the relationship between two accounting figures.

2.2 Ratio Analysis

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

a. Calculation Basis (Basis of Calculation):

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

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

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

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

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

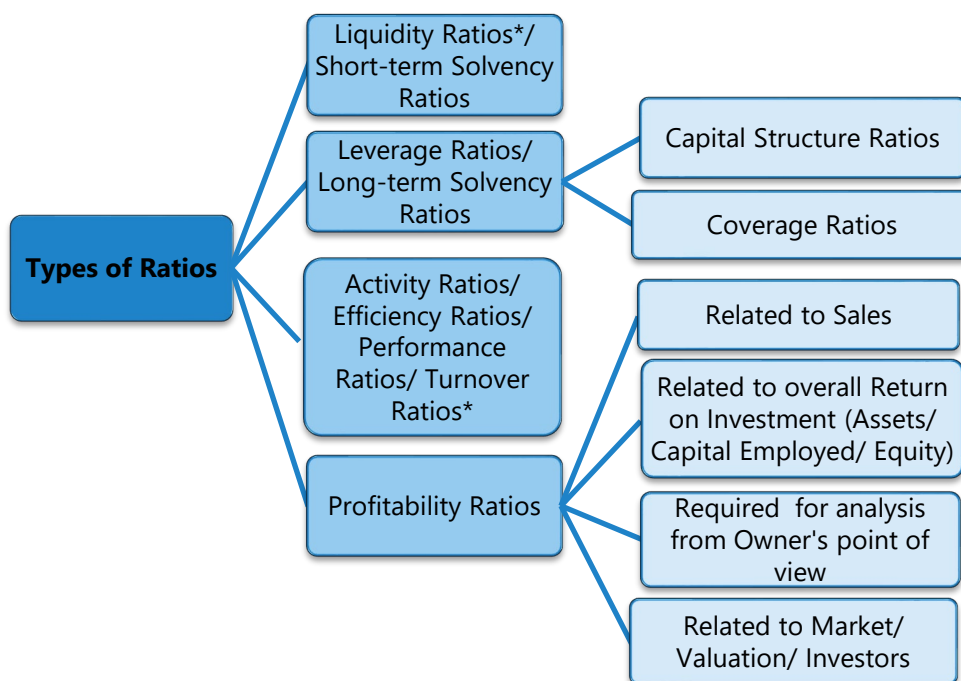
2.3 Sources of Financial Data for Analysis

The sources of information for financial statement analysis are:

- i. Annual Reports
- ii. Interim financial statements
- iii. Notes to Accounts
- iv. Statement of cash flows
- v. Business periodicals.
- vi. Credit and investment advisory services



3. TYPES OF RATIOS



Classification of Ratios

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

3.1 Liquidity Ratios

The terms '**liquidity**' and '**short-term solvency**' are used synonymously.

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

Various Liquidity Ratios are:

- (a) Current Ratio
- (b) Quick Ratio or Acid test Ratio
- (c) Cash Ratio or Absolute Liquidity Ratio
- (d) Basic Defense Interval or Interval Measure Ratios
- (e) Net Working Capital

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

The main question this ratio addresses is: "**Does your business have enough current assets to meet the payment schedule of its current debts with a margin of safety for possible losses in current assets?**" In other words, current ratio measures whether a firm has enough resources to meet its current obligations.

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

Where,

Current Asset = Inventories + Sundry Debtors + Cash and Bank Balances + Receivables/ Accruals + Loans and Advances + Disposable Investments + Any other current assets.

Current Liabilities = Creditors for goods and services + Short-term Loans + Bank Overdraft + Cash Credit + Outstanding Expenses + Provision for Taxation + Proposed Dividend + Unclaimed Dividend + Any other current liabilities.

Interpretation

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

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

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

Where,

Quick Assets = Current Assets – Inventories – Prepaid expenses

Current Liabilities = As mentioned under Current Ratio.

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

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

Interpretation

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

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

$$\begin{aligned}\text{Cash Ratio} &= \frac{\text{Cash and Bank balances} + \text{Marketable Securities}}{\text{Current Liabilities}} \\ \text{Or,} \\ &= \frac{\text{Cash and Bank balances} + \text{Current Investments}}{\text{Current Liabilities}}\end{aligned}$$

Interpretation

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

- (d) **Basic Defense Interval/ Interval Measure:**

$$\begin{aligned}\text{Basic Defense Interval} &= \frac{\text{Cash and Bank balances} + \text{Net Receivables} + \text{Marketable Securities}}{\text{Operating Expenses} \div \text{No. of days (say 360)}} \\ \text{Or} \\ &= \frac{\text{Current Assets} - \text{Prepaid expenses} - \text{Inventories}}{\text{Daily Operating Expenses}}\end{aligned}$$

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

Interpretation

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

- (e) **Net Working Capital:** Net working capital is more a measure of cash flow than a ratio. The result of this calculation must be a positive number. However, in certain business models it may be negative. It is calculated as shown below:

$$\text{Net Working Capital} = \text{Current Assets} - \text{Current Liabilities (Excluding short-term bank borrowing)}$$

Interpretation

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

3.2 Long-term Solvency Ratios/ Leverage Ratios

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

- (i) Periodic payment of interest during the period of the loan and
- (ii) Repayment of principal amount on maturity.

Leverage ratios are of two types:

1. Capital Structure Ratios

- (a) Equity Ratio
- (b) Debt Ratio
- (c) Debt to Equity Ratio
- (d) Debt to Total Assets Ratio
- (e) Capital Gearing Ratio
- (f) Proprietary Ratio

2. Coverage Ratios

- (a) Debt-Service Coverage Ratio (DSCR)
- (b) Interest Coverage Ratio
- (c) Preference Dividend Coverage Ratio
- (d) Fixed Charges Coverage Ratio

3.2.1 Capital Structure Ratios

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

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

Various capital structure ratios are:

(a) Equity Ratio:

$$\text{Equity Ratio} = \frac{\text{Shareholder's Equity}}{\text{Net Assets}}$$

The **shareholder's equity** is Equity share capital and Reserves & Surplus (excluding fictitious assets etc).

Net Assets or Capital employed includes Net Fixed Assets and Net Current Assets (Current Assets – Current Liabilities).

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

(b) Debt Ratio:

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

Total debt or total outside liabilities includes short and long term borrowings from financial institutions, debentures/bonds, deferred payment arrangements for buying capital equipment, bank borrowings, public deposits and any other interest bearing loan.

Interpretation

This ratio is used to analyse the long-term solvency of a firm. A ratio greater than 1 would mean greater portion of company assets are funded by debt and could be a risky scenario.

(c) Debt to Equity Ratio:

$$\begin{aligned}\text{Debt to Equity Ratio} &= \frac{\text{Total Outside Liabilities}}{\text{Shareholders' Equity}} = \frac{\text{Total Debt}^*}{\text{Shareholder's Equity}} \\ &= \frac{\text{Long-term Debt}^{**}}{\text{Shareholders' equity}}\end{aligned}$$

*Not merely long-term debt i.e. both current & non-current liabilities.

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

Interpretation

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

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

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

Higher the ratio, indicates that assets are less backed up by equity and hence higher financial leverage.

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

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

- (f) **Proprietary Ratio:**

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

Proprietary fund includes Equity Share Capital, Preference Share Capital and Reserve & Surplus.

Total assets exclude fictitious assets and losses.

Interpretation

It indicates the proportion of total assets financed by shareholders. Higher the ratio, less risky scenario it shall be.

3.2.2 Coverage Ratios

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

- (i) Interest on loans
- (ii) Preference dividend
- (iii) Amortisation of principal or repayment of the instalment of loans or redemption of preference capital on maturity.

The following are important coverage ratios:

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

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

Earnings available for debt service*

= Net profit (Earning after taxes) + Non-cash operating expenses like depreciation and other amortizations + Interest + other adjustments like loss on sale of Fixed Asset etc.

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

Interpretation

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

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

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

Interpretation

Earnings before interest and taxes are used in the numerator of this ratio because the ability to pay interest is not affected by tax burden as interest on debt funds is deductible expense. It measures how many times a company can cover its current interest payment with its available earnings? In other words, it reflects the margin of safety a company has for paying interest on its debt during a given period.

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

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

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

Interpretation

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

Similarly, **Equity Dividend coverage ratio** can also be calculated as:

$$\text{Equity Dividend Coverage Ratio} = \frac{\text{Earning after taxes (EAT) - Preference dividend}}{\text{Equity dividend}}$$

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

$$\text{Fixed Charges Coverage Ratio} = \frac{\text{"EBIT + Depreciation"}}{\text{"Interest + Repayment of Loan"}}$$

Notes for calculating Ratios:

1. EBIT (Earnings before interest and taxes) = PBIT (Profit before interest and taxes),
EAT (Earnings after taxes) = PAT (Profit after taxes)
EBT (Earnings before taxes) = PBT (Profit before taxes)
2. Ratios shall be calculated based on requirement and availability of information and may deviate from original formulae. If required, assumptions should be given.
3. Numerator should be taken in correspondence with the denominator and vice-versa.

3.3 Activity Ratios/ Efficiency Ratios/ Performance Ratios/ Turnover Ratios

These ratios are employed to **evaluate the efficiency with which the firm manages and utilises its assets**. For this reason, they are often called as 'Asset management ratios'. These ratios usually indicate the frequency of sales with

respect to its assets. These assets may be capital assets or working capital or average inventory.

Activity Ratios/ Efficiency Ratios/ Performance Ratios/ Turnover Ratios:

- (a) Total Assets Turnover Ratio
- (b) Fixed Assets Turnover Ratio
- (c) Capital Turnover Ratio/ Net Assets Turnover Ratio
- (d) Current Assets Turnover Ratio
- (e) Working Capital Turnover Ratio
 - (i) Inventory/ Stock Turnover Ratio
 - (ii) Receivables (Debtors) Turnover Ratio
 - (iii) Payables (Creditors) Turnover Ratio

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

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

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

Interpretation

A high total assets turnover ratio indicates the efficient utilisation of total assets in generation of sales. Similarly, a low asset turnover ratio indicates total assets are not efficiently used to generate sales.

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

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

Interpretation

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

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

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

Interpretation

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

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

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

Interpretation

The higher the ratio, the more efficient is the utilisation of current assets in generating sales.

(e) Working Capital Turnover Ratio: It measures how effective a company is at generating sales for every rupee of working capital put to use.

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

Interpretation

Higher the ratio, the more efficient is the utilisation of working capital in generating sales. However, a very high working capital turnover ratio indicates that the company needs to raise additional working capital for future needs.

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

Note: Average of Total Assets/ Fixed Assets/ Current Assets/ Net Assets/ Working Capital also can be taken in the denominator for the above ratios.

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

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

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

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

$$\text{Raw Material Inventory Turnover Ratio} = \frac{\text{Raw Material Consumed}}{\text{Average Raw Material Stock}}$$

Interpretation

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

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

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

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

A low debtors' turnover ratio reflects liberal credit terms granted to customers, while a high ratio shows that collections are made rapidly.

Receivables (Debtors) Velocity/Average Collection Period: Debtor's turnover ratio indicates the average collection period. However, the average collection period can be directly calculated as follows:

$$= \frac{\text{Average Accounts Receivables}}{\text{Average Daily Credit Sales}} \quad \text{Or} \quad \frac{12 \text{ months}/52 \text{ weeks}/360 \text{ days}}{\text{Receivable Turnover Ratio}}$$

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

Interpretation

The average collection period measures the average number of days it takes to collect an account receivable. This ratio is also referred to as the number of days of receivable and the number of day's sales in receivables. In determining the credit policy, debtor's turnover and average collection period provide a unique guidance.

- (iii) **Payables Turnover Ratio:** This ratio is calculated on the same lines as receivable turnover ratio is calculated. It measures how fast a company makes payment to its creditors. It shows the velocity of payables payment by the firm. It is calculated as follows:

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

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

Payable Velocity/ Average payment period can be calculated using:

$$= \frac{\text{Average Accounts Payable}}{\text{Average Daily Credit Purchases}} \quad \text{Or} \quad \frac{12 \text{ months}/52 \text{ weeks}/360 \text{ days}}{\text{Payables Turnover Ratio}}$$

Interpretation

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

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

Notes for calculating Ratios:

1. Only selling & distribution expenses differentiate Cost of Goods Sold (COGS) and Cost of Sales (COS). In its absence, COGS will be equal to Cost of Sales.
2. We can consider Cost of Goods Sold/ Cost of Sales to calculate turnover ratios eliminating profit part.
3. Average of Total Assets/ Fixed Assets/ Current Assets/ Net Assets/ Working Capital also can be taken in denominator while calculating the above ratios. In fact, when average figures of total assets, net assets, capital employed, shareholders' fund etc. are available it may be preferred to calculate ratios by using this information.
4. Ratios shall be calculated based on requirement and availability of information and may deviate from original formulae. If required, assumptions should be given.

3.4 Profitability Ratios

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

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

- (i) Profitability Ratios related to Sales
- (ii) Profitability Ratios related to overall Return on Investment

- (iii) Profitability Ratios required for Analysis from Owner's Point of View
- (iv) Profitability Ratios related to Market/ Valuation/ Investors

Profitability Ratios are as follows:

(i) Profitability Ratios based on Sales

- (a) Gross Profit Ratio
- (b) Net Profit Ratio
- (c) Operating Profit Ratio
- (d) Expenses Ratio

(ii) Profitability Ratios related to Overall Return on Assets/ Investments

- (a) Return on Investments (ROI)
 - (i) Return on Assets (ROA)
 - (ii) Return of Capital Employed (ROCE)
 - (iii) Return on Equity (ROE)

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

- (a) Earnings per Share (EPS)
- (b) Dividend per Share (DPS)
- (c) Dividend Pay-out Ratio (DP)

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

- (a) Price Earnings (P/E) Ratio
- (b) Dividend and Earning Yield
- (c) Market Value/ Book Value per Share (MV/BV)
- (d) Q Ratio

3.4.1 Profitability Ratios based on Sales

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

$$\text{Gross Profit Ratio} = \frac{\text{Gross Profit}}{\text{Sales}} \times 100$$

Interpretation

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

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

$$(i) \quad \text{Net Profit Ratio} = \frac{\text{Net Profit}}{\text{Sales}} \times 100$$

Or

$$\frac{\text{Earnings after taxes (EAT)}}{\text{Sales}} \times 100$$

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

Interpretation

Net Profit ratio finds the proportion of revenue that finds its way into profits after meeting all expenses. A high net profit ratio indicates positive returns from the business.

- (c) **Operating Profit Ratio:**

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

$$\text{Operating Profit Ratio} = \frac{\text{Operating Profit}}{\text{Sales}} \times 100$$

$$\text{or,} \\ \frac{\text{Earnings before interest and taxes (EBIT)}}{\text{Sales}} \times 100$$

Where,

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

Interpretation

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

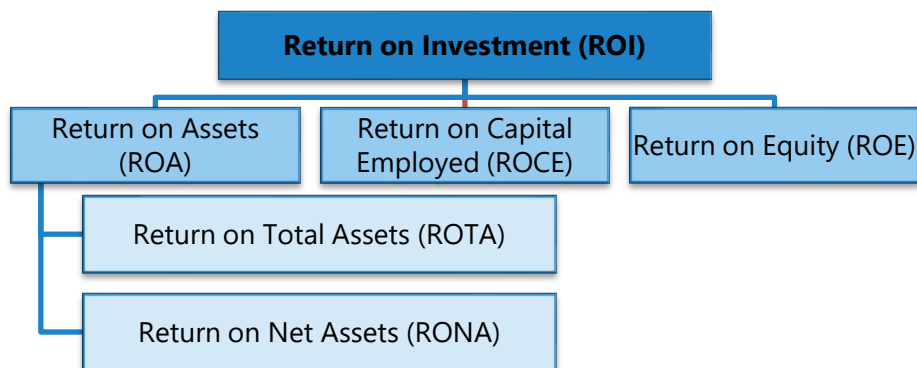
- (d) **Expenses Ratio:** Based on different concepts of expenses it can be expressed in different variants as below:

$$\begin{aligned} \text{(i) Cost of Goods Sold (COGS) Ratio} &= \frac{\text{COGS}}{\text{Sales}} \times 100 \\ \text{(ii) Operating Expenses Ratio} &= \frac{\text{Administrative exp. + Selling \& Distribution OH}}{\text{Sales}} \times 100 \\ \text{(iii) Operating Ratio} &= \frac{\text{COGS + Operating expenses}}{\text{Sales}} \times 100 \\ \text{(iv) Financial Expenses Ratio} &= \frac{\text{Financial expenses}^*}{\text{Sales}} \times 100 \end{aligned}$$

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

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

3.4.2 Profitability Ratios related to Overall Return on Assets/ Investments



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

$$\text{Return on Investment} = \frac{\text{Return/Profit/Earnings}}{\text{Investment}} \times 100$$

Or,

$$= \frac{\text{Return/Profit/Earnings}}{\text{Sales}} \times \frac{\text{Sales}}{\text{Investment}}$$

Or,

$$= \text{Profitability Ratio} \times \text{Investment Turnover Ratio}$$

Since, Profitability Ratio = $\frac{\text{Return/Profit/Earnings}}{\text{Sales}}$, and

$$\text{Investment Turnover Ratio} = \frac{\text{Sales}}{\text{Investments}}$$

ROI can be improved either by improving Profitability Ratio or Investment Turnover Ratio or by both.

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

- (i) **Return on Assets (ROA),**
- (ii) **Return on Capital Employed (ROCE) and**
- (iii) **Return on Equity (ROE).**

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

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

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

$$\text{or } \frac{\text{Net Profit after taxes}}{\text{Average Fixed Assets}}$$

* Note: Sometimes, total assets may also be considered instead of average assets.

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

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

Or

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

Or

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

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

The ROCE is calculated as follows:

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

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

Sometimes, it is also calculated as:

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

Where,

Capital Employed = Total Assets – Current Liabilities

Or

= Fixed Assets + Working Capital

Or

= Equity + Long Term Debt

Interpretation

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

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

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

$$\text{ROE} = \frac{\text{Net Profit after taxes - Preference dividend (if any)}}{\text{Net Worth/ Equity Shareholders' Funds}} \times 100$$

Interpretation

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

Return on Equity using the Du Pont Model:

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

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

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

$$\text{Profitability/ Net Profit margin} = \frac{\text{Profit/ Net Income}}{\text{Sales/ Revenue}}$$

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

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

$$\text{Investment Turnover/ Asset Turnover/ Capital Turnover} = \frac{\text{Sales/ Revenue}}{\text{Investment/ Assets/ Capital}}$$

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

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

$$\text{Equity Multiplier} = \frac{\text{Investment /Assets /Capital}}{\text{Shareholders' Equity}}$$

Calculation of Return on Equity

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

$$\text{Return on Equity} = (\text{Profitability/ Net profit margin}) \times (\text{Investment Turnover/ Asset Turnover / Capital Turnover}) \times \text{Equity Multiplier}$$

Example - 1: XYZ Company's details are as under:

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

Here, Return on Equity as per Du Pont Model will be calculated as follows:

Net Profit Margin = Net Income (₹ 4,212) ÷ Revenue (₹ 29,261)

= 0.14439 or 14.39%

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

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

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

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

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

Analysis: A 31.02% return on equity is good in any industry. Yet, if you were to leave out the equity multiplier to see how much company would earn if it were completely debt-free, you will see that the ROE drops to 15.04% (0.1439 x 1.0455). 15.04% of the return on equity was due to profit margins and sales, while remaining 15.98% was due to returns earned on the debt at work in the business. If you could find a company at a comparable valuation with the same return on equity yet a higher percentage arose from internally generated sales, it would be more attractive.

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

- (a) **Earnings per Share (EPS):** The profitability of a firm from the point of view of ordinary shareholders can be measured in terms of earnings per share basis. It is calculated as follows:

$$\text{Earnings per Share (EPS)} = \frac{\text{Net profit available to equity shareholders}}{\text{Number of equity shares outstanding}}$$

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

$$\text{Dividend per Share (DPS)} = \frac{\text{Total Dividend paid to equity shareholders}}{\text{Number of equity shares outstanding}}$$

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

$$\text{Dividend pay-out Ratio} = \frac{\text{Dividend per equity share (DPS)}}{\text{Earning per Share (EPS)}}$$

3.4.4 Profitability Ratios related to market/valuation/Investors

These ratios consider the market value of the company's shares in calculation. Frequently, share prices data are punched with the accounting data to generate new set of information. These are (a) Price- Earnings Ratio, (b) Dividend Yield, (c) Market Value/ Book Value per share, (d) Q Ratio.

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

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

Interpretation

It indicates the payback period to the investors or prospective investors. A higher P/E ratio could either mean that a company's stock is over-valued or the investors are expecting high growth rates in future.

- (b) **Dividend and Earning Yield:**

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

Or,

$$= \frac{\text{Dividend per Share (DPS)}}{\text{Market Price per Share (MPS)}} \times 100$$

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

*Also known as Earnings Price (EP) Ratio.

Interpretation

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

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

$$\begin{aligned} \text{Market Value/ Book Value per Share (MV/BV)} &= \frac{\text{Average share price}}{\text{Net worth} \div \text{No. of equity shares}} \\ &\text{Or} \\ &= \frac{\text{Closing share price}}{\text{Net worth} \div \text{No. of equity shares}} \end{aligned}$$

Interpretation

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

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

$$\begin{aligned} \text{Q Ratio} &= \frac{\text{Market Value of equity and liabilities}}{\text{Estimated replacement cost of assets}} \\ &\text{Or} \\ &= \frac{\text{Market Value of a Company}}{\text{Assets' Replacement Cost}} \end{aligned}$$

Thus, this ratio represents the relationship between market valuation and intrinsic value. Equilibrium is when Q Ratio = 1 because when it is less than 1, it could mean that the stock is undervalued and when it is more than 1, it could mean that stock is overvalued.

Notes for calculating Ratios:

1. EBIT (Earnings before interest and taxes) = PBIT (Profit before interest and taxes),
EAT (Earnings after taxes) = PAT (Profit after taxes),
EBT (Earnings before taxes) = PBT (Profit before taxes)
2. In absence of preference dividend PAT can be taken as earnings available to equity shareholders.
3. If information is available then average capital employed shall be taken while calculating ROCE.
4. Ratios shall be calculated based on requirement and availability of information and may deviate from original formulae. If required, assumptions should be given.
5. Numerator should be taken in correspondence with the denominator and vice-versa.



4. USERS AND OBJECTIVE OF FINANCIAL ANALYSIS - A BIRD'S EYE VIEW

Financial Statement analysis is useful to various shareholders to obtain the derived information about the firm.

S.No.	Users	Objectives	Ratios used in general
1.	Shareholders	Being owners of the organisation they are interested to know about profitability and growth of the organization	Mainly Profitability Ratios [In particular Earning per share (EPS), Dividend per share (DPS), Price Earnings (P/E), Dividend Payout ratio (DP)]
2.	Investors	They are interested to	◆ Profitability Ratios

		know overall financial health of the organisation particularly future perspective of the organisations.	<ul style="list-style-type: none"> ♦ Capital structure Ratios ♦ Solvency Ratios ♦ Turnover Ratios
3.	Lenders	They will keep an eye on the safety perspective of their money lent to the organisation	<ul style="list-style-type: none"> ♦ Coverage Ratios ♦ Solvency Ratios ♦ Turnover Ratios ♦ Profitability Ratios
4.	Creditors	They are interested to know liability position of the organisation particularly in short term. Creditors would like to know whether the organisation will be able to pay the amount on due date.	<ul style="list-style-type: none"> ♦ Liquidity Ratios ♦ Short term solvency Ratios/ Liquidity Ratios
5.	Employees	They will be interested to know the overall financial wealth of the organisation and compare it with competitor company.	<ul style="list-style-type: none"> ♦ Liquidity Ratios ♦ Long terms solvency Ratios ♦ Profitability Ratios ♦ Return on investment

6.	Regulator / Government	They will analyse the financial statements to determine taxations and other details payable to the government.	♦ Profitability Ratios
7.	Managers (a) Production Managers	They are interested to know about data regarding input output, production quantities etc.	♦ Input output Ratio ♦ Raw material consumption ratio.
	(b) Sales Managers	Data related to units sold for various years, other associated figures and predicted future sales figure will be an area of interest for them	♦ Turnover ratios (basically receivable turnover ratio) ♦ Expenses Ratios
	(c) Financial Manager	They are interested to know various ratios for their future predictions of financial requirement.	♦ Profitability Ratios (particularly related to Return on investment) ♦ Turnover ratios ♦ Capital Structure Ratios

	(d) Chief Executive/ General Manager	They will try to assess the complete perspective of the company, starting from Sales, Finance, Inventory, Human resources, Production etc.	♦ All Ratios
8.	Different Industry		
	(a) Telecom		♦ Ratio related to 'call' ♦ Revenue and expenses per customer
	(b) Bank	Finance Manager/ Analyst will calculate ratios of their company and compare it with Industry norms.	♦ Loan to deposit Ratios ♦ Operating expenses and income ratios
	(c) Hotel		♦ Room occupancy ratio ♦ Bed occupancy Ratios
	(d) Transport		♦ Passenger-kilometre ♦ Operating cost-per passenger kilometre



5. APPLICATION OF RATIO ANALYSIS IN FINANCIAL DECISION MAKING

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

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

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

5.1 Financial Ratios for Evaluating Performance

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

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

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

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

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

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

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

- (d) **Overall Profitability:** Unlike the outside parties which are interested in one aspect of the financial position of a firm, the management is constantly concerned about the overall profitability of the enterprise. That is, they are concerned about the ability of the firm to meet its short-term as well as long-term obligations to its creditors, to ensure a reasonable return to its owners and secure optimum utilisation of the assets of the firm. This is possible if an integrated view is taken and all the ratios are considered together.
- (e) **Inter-firm Comparison:** Ratio analysis not only throws light on the financial position of a firm but also serves as a stepping stone to remedial measures. This is made possible due to inter-firm comparison/comparison with industry averages.

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

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

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

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

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

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

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



6. LIMITATIONS OF FINANCIAL RATIOS

The limitations of financial ratios are listed below:

- (i) **Diversified product lines:** Many businesses operate a large number of divisions in quite different industries. In such cases ratios calculated on the basis of aggregate data cannot be used for inter-firm comparisons.
- (ii) **Financial data are badly distorted by inflation:** Historical cost values may be substantially different from true values. Such distortions of financial data are also carried in the financial ratios.
- (iii) **Seasonal factors:** It may also influence financial data.

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

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

- (iv) **To give a good shape to the popularly used financial ratios (like current ratio, debt-equity ratios etc.):** The business may make some year-end adjustments. Such window dressing can change the character of financial ratios which would be different had there been no such change.
- (v) **Differences in accounting policies and accounting period:** It can make the accounting data of two firms non-comparable as also the accounting ratios.

- (vi) **No standard set of ratios against which a firm's ratios can be compared:** Sometimes a firm's ratios are compared with the industry average. But if a firm desires to be above the average, then industry average becomes a low standard. On the other hand, for a below average firm, industry averages become too high a standard to achieve.
- (vii) **Difficulty to generalise whether a particular ratio is good or bad:** For example, a low current ratio may be said 'bad' from the point of view of low liquidity, but a high current ratio may not be 'good' as this may result from inefficient working capital management.
- (viii) **Financial ratios are inter-related, not independent:** Viewed in isolation one ratio may highlight efficiency. But when considered as a set of ratios they may speak differently. Such interdependence among the ratios can be taken care of through multivariate analysis (analyzing the relationship between several variables simultaneously).

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

7. FINANCIAL ANALYSIS

It may be of two types: - Horizontal and vertical.

Horizontal Analysis: When financial statement of one year are analysed and interpreted after comparing with another year or years, it is known as horizontal analysis. It can be based on the ratios derived from the financial information over the same time span.

Vertical Analysis: When financial statement of single year is analyzed then it is called vertical analysis. This analysis is useful in inter firm comparison. Every item of Profit and loss account is expressed as a percentage of gross sales, while every item on a balance sheet is expressed as a percentage of total assets held by the firm.



8. SUMMARY OF RATIOS

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

Ratio	Formulae	Interpretation
Liquidity Ratio		
Current Ratio	$\frac{\text{Current Assets}}{\text{Current Liabilities}}$	A simple measure that estimates whether the business can pay short term debts. Ideal ratio is 2.
Quick Ratio	$\frac{\text{Quick Assets}}{\text{Current Liabilities}}$	It measures the ability to meet current debt immediately. Ideal ratio is 1.
Cash Ratio	$\frac{(\text{Cash and Bank balances} + \text{Marketable Securities})}{\text{Current Liabilities}}$	It measures absolute liquidity of the business.
Basic Defense Interval Ratio	$\frac{(\text{Cash and Bank balances} + \text{Net Reveivables} + \text{Marketable Securities})}{\text{Opearing Expenses} \div \text{No. of days}}$	It measures the ability of the business to meet regular cash expenditures.
Net Working Capital	$\text{Current Assets} - \text{Current Liabilities}$	It is a measure of cash flow to determine the ability of business to survive financial crisis.
Capital Structure Ratio		
Equity Ratio	$\frac{\text{Shareholders' Equity}}{\text{Net Assets}}$	It indicates owner's fund in companies to total fund invested.
Debt Ratio	$\frac{\text{Total Debt}}{\text{Net Assets}}$	It is an indicator of use of outside funds.
Debt to equity Ratio	$\frac{\text{Total Debt}}{\text{Shareholders' Equity}}$	It indicates the composition of capital structure in terms of debt and equity.

Debt to Total Assets Ratio	$\frac{\text{Total Debt}}{\text{Total Assets}}$	It measures how much of total assets is financed by the debt.
Capital Gearing Ratio	$\frac{\text{Preference Share Capital + Debentures + Other Borrowed funds}}{\text{Equity Share Capital + Reserves \& Surplus – Losses}}$	It shows the proportion of fixed interest bearing capital to equity shareholders' fund. It also signifies the advantage of financial leverage to the equity shareholder.
Proprietary Ratio	$\frac{\text{Proprietary Fund}}{\text{Total Assets}}$	It measures the proportion of total assets financed by shareholders.
Coverage Ratios		
Debt Service Coverage Ratio (DSCR)	$\frac{\text{Earnings available for debt services}}{\text{Interest + Instalments}}$	It measures the ability to meet the commitment of various debt services like interest, instalment etc. Ideal ratio is 2.
Interest Coverage Ratio	$\frac{\text{EBIT}}{\text{Interest}}$	It measures the ability of the business to meet interest obligations. Ideal ratio is > 1.
Preference Dividend Coverage Ratio	$\frac{\text{Net Profit / Earning after taxes (EAT)}}{\text{Preference dividend liability}}$	It measures the ability to pay the preference shareholders' dividend. Ideal ratio is > 1.
Fixed Charges Coverage Ratio	$\frac{\text{EBIT + Depreciation}}{\text{Interest + Repayment of loan}}$	This ratio shows how many times the cash flow before interest and taxes covers all fixed financing charges. The ideal ratio is > 1.
Activity Ratio/ Efficiency Ratio/ Performance Ratio/ Turnover Ratio		
Total Asset Turnover Ratio	$\frac{\text{Sales / Cost of Goods Sold}}{\text{Average Total Assets}}$	A measure of total asset utilisation. It helps to answer the question - What

		sales are being generated by each rupee's worth of assets invested in the business?
Fixed Assets Turnover Ratio	$\frac{\text{Sales / Cost of Goods Sold}}{\text{Fixed Assets}}$	This ratio is about fixed asset capacity. A reducing sales or profit being generated from each rupee invested in fixed assets may indicate overcapacity or poorer-performing equipment.
Capital Turnover Ratio	$\frac{\text{Sales / Cost of Goods Sold}}{\text{Net Assets}}$	This indicates the firm's ability to generate sales per rupee of long term investment.
Working Capital Turnover Ratio	$\frac{\text{Sales / COGS}}{\text{Working Capital}}$	It measures the efficiency of the firm to use working capital.
Inventory Turnover Ratio	$\frac{\text{COGS / Sales}}{\text{Average Inventory}}$	It measures the efficiency of the firm to manage its inventory.
Debtors Turnover Ratio	$\frac{\text{Credit Sales}}{\text{Average Accounts Receivable}}$	It measures the efficiency at which firm is managing its receivables.
Receivables (Debtors') Velocity	$\frac{\text{Average Accounts Receivables}}{\text{Average Daily Credit Sales}}$	It measures the velocity of collection of receivables.
Payables Turnover Ratio	$\frac{\text{Annual Net Credit Purchases}}{\text{Average Accounts Payables}}$	It measures how fast a company makes payment to its creditors.
Payables Velocity	$\frac{\text{Average Accounts Payable}}{\text{Average Daily Credit Purchases}}$	It measures the velocity of payment of payables.

Profitability Ratios based on Sales		
Gross Profit Ratio	$\frac{\text{Gross Profit}}{\text{Sales}} \times 100$	This ratio tells us something about the business's ability consistently to control its production costs or to manage the margins it makes on products it buys and sells.
Net Profit Ratio	$\frac{\text{Net Profit}}{\text{Sales}} \times 100$	It measures the relationship between net profit and sales of the business.
Operating Profit Ratio	$\frac{\text{Operating Profit}}{\text{Sales}} \times 100$	It measures operating performance of business.
Expenses Ratio		
Cost of Goods Sold (COGS) Ratio	$\frac{\text{COGS}}{\text{Sales}} \times 100$	It measures portion of a particular expenses in comparison to sales.
Operating Expenses Ratio	$\frac{\text{Administrative exp. + Selling \& Distribution Overhead}}{\text{Sales}}$	
Operating Ratio	$\frac{\text{COGS} + \text{Operating expenses}}{\text{Sales}} \times 100$	
Financial Expenses Ratio	$\frac{\text{Financial expenses}}{\text{Sales}} \times 100$	
Profitability Ratios related to Overall Return on Assets/ Investments		
Return on Investment (ROI)	$\frac{\text{Return / Profit / Earnings}}{\text{Investments}} \times 100$	It measures overall return of the business on investment/ equity funds/capital employed/ assets.
Return on Assets (ROA)	$\frac{\text{Net Profit after taxes}}{\text{Average total assets}}$	It measures net profit per rupee of average total assets/average tangible assets/average fixed assets.

Return on Capital Employed ROCE (Pre-tax)	$\frac{\text{EBIT}}{\text{Capital Employed}} \times 100$	It measures overall earnings (either pre-tax or post tax) on total capital employed.
Return on Capital Employed ROCE (Post-tax)	$\frac{\text{EBIT (1-t)}}{\text{Capital Employed}} \times 100$	It indicates earnings available to equity shareholders in comparison to equity shareholders' net worth.
Return on Equity (ROE)	$\frac{\left(\frac{\text{Net Profit after taxes - Preference dividend (if any)}}{\text{Net worth}} \right)}{\text{Equity shareholders' fund}} \times 100$	
Profitability Ratios Required for Analysis from Owner's Point of View		
Earnings per Share (EPS)	$\frac{\text{Net profit available to equity shareholders}}{\text{Number of equity shares outstanding}}$	EPS measures the overall profit generated for each share in existence over a particular period.
Dividend per Share (DPS)	$\frac{\text{Dividend paid to equity shareholders}}{\text{Number of equity shares outstanding}}$	Proportion of profit distributed per equity share.
Dividend payout Ratio (DP)	$\frac{\text{Dividend per equity share}}{\text{Earning per Share (EPS)}}$	It shows % of EPS paid as dividend and retained earnings.
Profitability Ratios related to market/ valuation/ Investors		
Price-Earnings per Share (P/E Ratio)	$\frac{\text{Market Price per Share (MPS)}}{\text{Earning per Share (EPS)}}$	At any time, the P/E ratio is an indication of how highly the market "rates" or "values" a business. A P/E ratio is best viewed in the context of a sector or market average to get a feel for relative value and stock market pricing.
Dividend Yield	$\frac{\text{Dividend} \pm \text{Change in share price}}{\text{Initial share price}} \times 100$	It measures dividend paid based on market price of shares.

	$\frac{\text{Dividend per Share (DPS)}}{\text{Market Price per Share (MPS)}} \times 100$	
Earnings Yield	$\frac{\text{Earnings per Share (EPS)}}{\text{Market Price per Share (MPS)}} \times 100$	It is the relationship of earning per share and market value of shares.
Market Value /Book Value per Share	$\frac{\text{Market value per share}}{\text{Book value per share}}$	It indicates market response of the shareholders' investment.
Q Ratio	$\frac{\text{Market Value of equity and liabilities}}{\text{Estimated replacement cost of assets}}$	It measures market value of equity as well as debt in comparison to all assets at their replacement cost.

Students may note that now a company is also required to disclose the following ratios in the notes to accounts while preparing Financial Statements:

- (a) Current Ratio,
- (b) Debt-Equity Ratio,
- (c) Debt Service Coverage Ratio,
- (d) Return on Equity Ratio,
- (e) Inventory turnover ratio,
- (f) Trade Receivables turnover ratio,
- (g) Trade payables turnover ratio,
- (h) Net capital turnover ratio,
- (i) Net profit ratio,
- (j) Return on Capital employed,
- (k) Return on investment.

ILLUSTRATION 1

In a meeting held at Solan towards the end of 2021-22, the Directors of HPCL Ltd. have taken a decision to diversify. At present HPCL Ltd. sells all finished goods from its own warehouse. The company issued debentures on 01.04.2022 and purchased fixed assets on the same day. The purchase prices have remained stable during the concerned period. Following information is provided to you:

INCOME STATEMENT

Particulars	2021-22 (₹)		2022-23 (₹)	
Cash Sales	30,000		32,000	
Credit Sales	2,70,000	3,00,000	3,42,000	3,74,000
Less: Cost of goods sold		2,36,000		2,98,000
Gross profit		64,000		76,000
Less: Operating Expenses:				
Warehousing	13,000		14,000	
Transport	6,000		10,000	
Administrative	19,000		19,000	
Selling	11,000	49,000	14,000	57,000
Net Profit		15,000		19,000

BALANCE SHEET

Assets & Liabilities	2021-22 (₹)		2022-23 (₹)	
Fixed Assets (Net Block)	-	30,000	-	40,000
Receivables	50,000		82,000	
Cash at Bank	10,000		7,000	
Stock	60,000		94,000	
Total Current Assets (CA)	1,20,000		1,83,000	
Payables	50,000		76,000	
Total Current Liabilities (CL)	50,000		76,000	
Working Capital (CA - CL)		70,000		1,07,000
Net Assets		1,00,000		1,47,000

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

You are required to CALCULATE the following ratios for the years 2021-22 and 2022-23:

- (i) Gross Profit Ratio
- (ii) Operating Expenses to Sales Ratio
- (iii) Operating Profit Ratio
- (iv) Capital Turnover Ratio
- (v) Stock Turnover Ratio
- (vi) Net Profit to Net Worth Ratio
- (vii) Receivables Collection Period

Ratio relating to capital employed should be based on the capital at the end of the year. Give the reasons for change in the ratios for 2 years. Assume opening stock of ₹ 40,000 for the year 2021-22. Ignore Taxation.

SOLUTION

Computation of Ratios		
Ratio	2021-22 (₹)	2022-23 (₹)
1. Gross profit ratio (Gross profit/sales)	$\frac{64,000 \times 100}{3,00,000} = 21.3\%$	$\frac{76,000 \times 100}{3,74,000} = 20.3\%$
2. Operating expense to sales ratio (Operating exp/ Total sales)	$\frac{49,000 \times 100}{3,00,000} = 16.3\%$	$\frac{57,000 \times 100}{3,74,000} = 15.2\%$
3. Operating profit ratio (Operating profit/ Total sales)	$\frac{15,000 \times 100}{3,00,000} = 5\%$	$\frac{19,000 \times 100}{3,74,000} = 5.08\%$

4. Capital turnover ratio (Sales / capital employed)	$\frac{3,00,000}{1,00,000} = 3$	$\frac{3,74,000}{1,47,000} = 2.54$
5. Stock turnover ratio (COGS/ Average stock) (Refer to W.N. 1)	$\frac{2,36,000}{50,000} = 4.72$	$\frac{2,98,000}{77,000} = 3.87$
6. Net Profit to Net worth ratio (Net profit / Net worth)	$\frac{15,000 \times 100}{1,00,000} = 15\%$	$\frac{19,000 \times 100}{1,17,000} = 16.24\%$
7. Receivables collection period (Average receivables/ Average daily credit sales) (Refer to W.N. 2)	$\frac{50,000}{739.73} = 67.6 \text{ days}$	$\frac{82,000}{936.99} = 87.5 \text{ days}$
Working notes (W.N.):		
1. Average Stock = (opening stock + closing stock)/2	$(40,000 + 60,000)/2 = 50,000$	$(60,000 + 94,000)/2 = 77,000$
2. Average daily sales = Credit sales / 365	$\frac{2,70,000}{365} = 739.73$	$\frac{3,42,000}{365} = 936.99$

Analysis: The decline in the Gross profit ratio could be either due to a reduction in the selling price or increase in the direct expenses (since the purchase price has remained the same). In this case, cost of goods sold have increased more than proportion of increment in sales & hence impacting gross profit ratio.

Similarly, there is a decline in the ratio of operating expenses to sales. Further analysis reveals that in comparison to increase in sales, there has a lesser proportionate increase in operating expenses. As a result, even the operating profit ratio has remained the same approximately in spite of a decline in the Gross profit ratio.

The company has not been able to deploy its capital efficiently. This is indicated by a decline in the Capital turnover ratio from 3 to 2.54 times.

The decline in stock turnover ratio implies that the company has increased its investment in stock. Net Profit to Net worth ratio has increased indicating that the company's Net worth or Shareholders' capital is efficient in generating profits.

The increase in the Receivables collection period indicates that the company has become liberal in extending credit on sales. There is a corresponding increase in the receivables also due to such credit policy.

ILLUSTRATION 2

Following is the abridged Balance Sheet of Alpha Ltd.:

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

With the help of the additional information furnished below, you are required to PREPARE Trading and Profit & Loss Account and Balance Sheet as at 31st March, 2023:

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

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

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

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

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

- (iii) Working capital ratio was 8 : 5.
- (iv) Quick assets ratio was 1 : 1.
- (v) The receivables (four-fifth of the quick assets) to sales ratio revealed a credit period of 2 months. There were no cash sales.
- (vi) Return on net worth was 10%.
- (vii) Gross profit was at the rate of 15% of selling price.
- (viii) Stock turnover was eight times for the year.

Ignore Taxation.

SOLUTION

Particulars	%	(₹)
Share capital (given to be same)	50%	1,00,000
Other shareholders funds	15%	30,000
5% Debentures	10%	20,000
Current Liabilities	25%	50,000
Total (1,00,000 / 50%)	100%	2,00,000

Calculation of Assets

$$\begin{aligned}
 \text{Total liabilities} &= \text{Total Assets} \\
 ₹ 2,00,000 &= \text{Total Assets} \\
 \text{Fixed Assets} &= 60\% \text{ of total fixed assets and current assets} \\
 &= ₹ 2,00,000 \times 60/100 = ₹ 1,20,000 \\
 \text{Current Assets} &= \text{Total Assets} - \text{Fixed Assets} \\
 &= ₹ 2,00,000 - ₹ 1,20,000 = ₹ 80,000
 \end{aligned}$$

Calculation of additions to Plant & Machinery

	₹
Total fixed assets	1,20,000
Less: Land & Buildings	80,000
Plant and Machinery (after providing depreciation)	40,000
Less: Existing Plant & Machinery (after extra depreciation of ₹ 5,000) i.e. 50,000 – 20,000	30,000
Addition to the Plant & Machinery	10,000

Calculation of stock

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

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

$$\text{₹ 50,000} = \text{₹ 80,000} - \text{Stock}$$

$$\text{Stock} = \text{₹ 80,000} - \text{₹ 50,000}$$

$$= \text{₹ 30,000}$$

$$\text{Receivables} = \frac{4}{5}^{\text{th}} \text{ of quick assets}$$

$$= (\text{₹ 80,000} - \text{₹ 30,000}) \times \frac{4}{5}$$

$$= \text{₹ 40,000}$$

$$\text{Receivables turnover} = \frac{\text{Receivables}}{\text{Credit Sales}} \times 12 \text{ Months} = 2 \text{ months}$$

$$= \frac{40,000 \times 12}{\text{Credit Sales}} = 2 \text{ months}$$

$$2 \times \text{credit sales} = 4,80,000$$

$$\text{Credit sales} = 4,80,000 / 2$$

$$= \text{₹ 2,40,000} = \text{Total Sales (As there were no cash sales)}$$

$$\text{Gross profit} = 15\% \text{ of sales} = \text{₹ 2,40,000} \times \frac{15}{100} = \text{₹ 36,000}$$

Return on net worth (net profit)

Net worth = ₹ 1,00,000 + ₹ 30,000

= ₹ 1,30,000

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

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

Projected profit and loss account for the year ended 31st March, 2023

Particulars	₹	Particulars	₹
To cost of goods sold	2,04,000	By sales	2,40,000
To gross profit	36,000		
	2,40,000		2,40,000
To debenture interest	1,000	By gross profit	36,000
To administration and other expenses (bal. fig.)	22,000		
To net profit	13,000		
	36,000		36,000

Projected Balance Sheet as at 31st March, 2023

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

ILLUSTRATION 3

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

You are required to CALCULATE: (i) Operating profit margin (before tax); (ii) net profit margin (after tax); (iii) return on assets (on operating profit after tax); (iv) asset turnover and (v) return on owners' equity.

SOLUTION

The net profit is calculated as follows:

Particulars	₹
Sales (150% of ₹ 4,80,000)	7,20,000
Direct costs	(4,80,000)
Gross profit	2,40,000
Operating expenses	(80,000)
Profit before Interest and Tax (EBIT)	1,60,000
Interest charges (8% of ₹ 4,00,000)	(32,000)
Profit before taxes	1,28,000
Taxes (@ 50%)	(64,000)
Net profit after taxes	64,000

$$(i) \quad \text{Operating profit margin} = \frac{\text{EBIT}}{\text{Sales}} = \frac{\text{₹ } 1,60,000}{\text{₹ } 7,20,000} = 0.2222 \text{ or } 22.22\%$$

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

$$(iii) \quad \text{Return on assets} = \frac{\text{EBIT} (1 - T)}{\text{Assets}} = \frac{\text{₹ } 1,60,000(1 - 0.5)}{8,00,000} = 0.10 \text{ or } 10\%$$

$$\begin{aligned}
 \text{(iv) Asset turnover} &= \frac{\text{Sales}}{\text{Assets}} = \frac{\text{₹ 7,20,000}}{\text{₹ 8,00,000}} = 0.9 \text{ times} \\
 \text{(v) Return on equity} &= \frac{\text{Net Profit after taxes}}{\text{Owners' equity}} = \frac{\text{₹ 64,000}}{50\% \text{ of ₹ 8,00,000}} \\
 &= \frac{\text{₹ 64,000}}{\text{₹ 4,00,000}} = 0.16 \text{ or } 16\%
 \end{aligned}$$

ILLUSTRATION 4

From the following ratios and information given below, PREPARE Trading Account, Profit and Loss Account and Balance Sheet of Aebece Company:

Fixed Assets	₹ 40,00,000
Closing Stock	₹ 4,00,000
Stock turnover ratio	10
Gross profit ratio	25 percent
Net profit ratio	20 percent
Net profit to capital	1/5
Capital to total liabilities	1/2
Fixed assets to capital	5/4
Fixed assets/Total current assets	5/7

SOLUTION**Workings:**

$$\begin{aligned}
 \text{(i)} \quad \frac{\text{Fixed Assets}}{\text{Total Current Assets}} &= \frac{5}{7} \\
 \text{Or, Total Current Assets} &= \frac{\text{₹ 40,00,000} \times 7}{5} = \text{₹ 56,00,000} \\
 \text{(ii)} \quad \frac{\text{Fixed Assets}}{\text{Capital}} &= \frac{5}{4} \\
 \text{Or, Capital} &= \frac{\text{₹ 40,00,000} \times 4}{5} = \text{₹ 32,00,000}
 \end{aligned}$$

$$(iii) \frac{\text{Capital}}{\text{Total Liabilities}^*} = \frac{1}{2}$$

Or, Total liabilities = ₹ 32,00,000 × 2 = ₹ 64,00,000

*It is assumed that total liabilities do not include capital.

$$(iv) \frac{\text{Net Profit}}{\text{Capital}} = \frac{1}{5}$$

Or, Net Profit = ₹ 32,00,000 × 1/5 = ₹ 6,40,000

$$(v) \frac{\text{Net Profit}}{\text{Sales}} = \frac{1}{5}$$

Or, Sales = ₹ 6,40,000 × 5 = ₹ 32,00,000

(vi) Gross Profit = 25% of ₹ 32,00,000 = ₹ 8,00,000

$$(vii) \text{ Stock Turnover} = \frac{\text{Cost of Goods Sold (i.e. Sales - Gross profit)}}{\text{Average Stock}} = 10$$

$$= \frac{\text{₹ 32,00,000} - \text{₹ 8,00,000}}{\text{Average Stock}} = 10$$

Or, Average Stock = ₹ 2,40,000

Or, $\frac{\text{Opening Stock} + \text{₹ 4,00,000}}{2} = ₹ 2,40,000$

Or, Opening Stock = ₹ 80,000

Trading Account

Particulars	(₹)	Particulars	(₹)
To Opening Stock	80,000	By Sales	32,00,000
To Manufacturing exp./ Purchase	27,20,000		
(Balancing figure)			
To Gross Profit b/d	8,00,000	By Closing Stock	4,00,000
	36,00,000		36,00,000

Profit and Loss Account

Particulars	(₹)	Particulars	(₹)
To Operating Expenses (Balancing figure)	1,60,000	By Gross Profit c/d	8,00,000
To Net Profit	6,40,000		
	8,00,000		8,00,000

Balance Sheet

Capital and Liabilities	(₹)	Assets	(₹)
Capital	32,00,000	Fixed Assets	40,00,000
Liabilities	64,00,000	Current Assets:	
		Closing Stock	4,00,000
		Other Current Assets	52,00,000
		(Bal. figure)	
	96,00,000		96,00,000

ILLUSTRATION 5

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

Particulars	2020-21	2021-22	2022-23
	₹	₹	₹
Cash	30,000	20,000	5,000
Accounts receivable	2,00,000	2,60,000	2,90,000
Inventory	4,00,000	4,80,000	6,00,000
	6,30,000	7,60,000	8,95,000
Net fixed assets	8,00,000	8,00,000	8,00,000
	14,30,000	15,60,000	16,95,000

	₹	₹	₹
<i>Accounts payable</i>	2,30,000	3,00,000	3,80,000
<i>Accruals</i>	2,00,000	2,10,000	2,25,000
<i>Bank loan (short-term)</i>	1,00,000	1,00,000	1,40,000
	5,30,000	6,10,000	7,45,000
<i>Long-term debt</i>	3,00,000	3,00,000	3,00,000
<i>Common stock</i>	1,00,000	1,00,000	1,00,000
<i>Retained earnings</i>	5,00,000	5,50,000	5,50,000
	14,30,000	15,60,000	16,95,000
	₹	₹	₹
<i>Sales</i>	40,00,000	43,00,000	38,00,000
<i>Cost of goods sold</i>	32,00,000	36,00,000	33,00,000
<i>Net profit</i>	3,00,000	2,00,000	1,00,000

Considering opening balance of Accounts Receivable and Inventory as 2,00,000 and 4,00,000 respectively as on 01.04.2020, ANALYSE the company's financial condition and performance over the last 3 years. Are there any problems?

SOLUTION

Ratios	2020-21	2021-22	2022-23
Current ratio (Current Assets / Current Liabilities)	1.19 $\left(\frac{₹ 6,30,000}{₹5,30,000} \right)$	1.25 $\left(\frac{₹7,60,000}{₹6,10,000} \right)$	1.20 $\left(\frac{₹8,95,000}{₹7,45,000} \right)$
Acid-test ratio (Quick Assets / Current Liabilities)	0.43 $\left(\frac{₹2,30,000}{₹5,30,000} \right)$	0.46 $\left(\frac{₹2,80,000}{₹6,10,000} \right)$	0.40 $\left(\frac{₹2,95,000}{₹7,45,000} \right)$

Receivables turnover ratio (Sales/ Average Receivables) (Refer Working Notes)	20 $\left(\frac{₹40,00,000}{₹2,00,000} \right)$	18.70 $\left(\frac{₹43,00,000}{₹2,30,000} \right)$	13.82 $\left(\frac{₹38,00,000}{₹2,75,000} \right)$
Average collection period (365 / Receivables turnover ratio)	18.25 (365/20)	19.52 (365/18.70)	26.41 (365/13.82)
Inventory turnover ratio (COGS / Average Inventory) (Refer Working Notes)	8 $\left(\frac{₹ 32,00,000}{₹ 4,00,000} \right)$	8.18 $\left(\frac{₹ 36,00,000}{₹ 4,40,000} \right)$	6.11 $\left(\frac{₹ 33,00,000}{₹ 5,40,000} \right)$
Total debt to net worth (Short term + Long term Debt) / (Common stock + Retained earnings)	1.38 $\left(\frac{₹ 8,30,000}{₹ 6,00,000} \right)$	1.40 $\left(\frac{₹ 9,10,000}{₹ 6,50,000} \right)$	1.61 $\left(\frac{₹ 10,45,000}{₹ 6,50,000} \right)$
Long-term debt to total capitalization	0.33 $\left(\frac{₹3,00,000}{₹9,00,000} \right)$	0.32 $\left(\frac{₹3,00,000}{₹9,50,000} \right)$	0.32 $\left(\frac{₹3,00,000}{₹9,50,000} \right)$
Gross profit margin (Gross Profit / Sales) {Gross profit = Sales – Cost of Goods sold}	0.20 $\left(\frac{₹8,00,000}{₹40,00,000} \right)$	0.16 $\left(\frac{₹7,00,000}{₹43,00,000} \right)$	0.13 $\left(\frac{₹5,00,000}{₹38,00,000} \right)$
Net profit margin (Net Profit / Sales)	0.075 $\left(\frac{₹3,00,000}{₹40,00,000} \right)$	0.047 $\left(\frac{₹2,00,000}{₹43,00,000} \right)$	0.026 $\left(\frac{₹1,00,000}{₹38,00,000} \right)$
Total Asset turnover (Sales / Total Assets)	2.80 $\left(\frac{₹40,00,000}{₹14,30,000} \right)$	2.76 $\left(\frac{₹43,00,000}{₹15,60,000} \right)$	2.24 $\left(\frac{₹38,00,000}{₹16,95,000} \right)$

Return on assets (Net profit/ Total Assets)	0.21 $\left(\frac{₹3,00,000}{₹14,30,000} \right)$	0.13 $\left(\frac{₹2,00,000}{₹15,60,000} \right)$	0.06 $\left(\frac{₹1,00,000}{₹16,95,000} \right)$
Working Notes			
Average receivables {(Opening + closing)/2}	(₹ 2,00,000 + ₹ 2,00,000)/2 = ₹ 2,00,000	(₹ 2,00,000 + ₹ 2,60,000)/2 = ₹ 2,30,000	(₹ 2,60,000 + ₹ 2,90,000)/2 = ₹ 2,75,000
Average Inventory {(Opening + closing)/2}	(₹ 4,00,000 + ₹ 4,00,000)/2 = ₹ 4,00,000	(₹ 4,00,000 + ₹ 4,80,000)/2 = ₹ 4,40,000	(₹ 4,80,000 + ₹ 6,00,000)/2 = ₹ 5,40,000

Analysis: The current ratio and quick ratio are less than the ideal ratio (2:1 and 1:1 respectively) indicating that the company is not having enough resources to meet its current obligations.

Receivables are growing slower, although the average collection period is still very reasonable relative to the terms given. Inventory turnover is slowing as well, indicating a relative build-up in inventories. The increase in receivables and inventories, coupled with the fact that net worth has increased very little, has resulted in the total debt-to-net worth ratio increasing to what would have to be regarded on an absolute basis as a high level.

Long-term debt to total capitalization has not changed relatively coupled with the fact that retained earnings of only ₹ 50,000 is made in year 2019-20, and there is no issuance of new long-term debt in year 2019-20 and 2020-21.

Both the gross profit and net profit margins have declined substantially. The relationship between the two suggests that the company has incurred more relative expenses. The build-up in inventories and receivables has resulted in a decline in the asset turnover ratio, and this, coupled with the decline in profitability, has resulted in a sharp decrease in the return on assets ratio.

ILLUSTRATION 6

Following information are available for Navya Ltd. along with various ratios relevant to the particular industry it belongs to. APPRAISE your comments on strength and weakness of Navya Ltd. comparing its ratios with the given industry norms.

Navya Ltd.**Balance Sheet as at 31.3.2023**

Liabilities	(₹)	Assets	(₹)
Equity Share Capital	48,00,000	Fixed Assets	24,20,000
10% Debentures	9,20,000	Cash	8,80,000
Sundry Creditors	6,60,000	Sundry debtors	11,00,000
Bills Payable	8,80,000	Stock	33,00,000
Other current Liabilities	4,40,000		-
Total	77,00,000	Total	77,00,000

Statement of Profitability**For the year ending 31.3.2023**

Particulars	(₹)	(₹)
Sales		1,10,00,000
Less: Cost of goods sold:		
Material	41,80,000	
Wages	26,40,000	
Factory Overhead	12,98,000	81,18,000
Gross Profit		28,82,000
Less: Selling and Distribution Cost	11,00,000	
Administrative Cost	12,28,000	23,28,000
Earnings before Interest and Taxes		5,54,000
Less: Interest Charges		92,000
Earning before Tax		4,62,000
Less: Taxes @ 50%		2,31,000
Net Profit (PAT)		2,31,000

Industry Norms

Ratios	Norm
<i>Current Ratio</i>	2.5
<i>Receivables Turnover Ratio</i>	8.0
<i>Inventory Turnover Ratio (based on Sales)</i>	9.0
<i>Total Assets Turnover Ratio</i>	2.0
<i>Net Profit Ratio</i>	3.5%
<i>Return on Total Assets (on EBIT)</i>	7.0%
<i>Return on Net worth (Based on Net profit)</i>	10.5%
<i>Total Debt/Total Assets</i>	60.0%

SOLUTION

Ratios	Navya Ltd.	Industry Norms
1. $\text{Current Ratio} = \frac{\text{Current Assets}}{\text{Current Liabilities}}$	$\frac{₹52,80,000}{₹19,80,000} = 2.67$	2.50
2. $\text{Receivable Turnover Ratio} = \frac{\text{Sales}}{\text{Debtors}}$	$\frac{₹1,10,00,000}{₹11,00,000} = 10.0$	8.00
3. $\text{Inventory turnover ratio} = \frac{\text{Sales}}{\text{Stock}}$	$\frac{₹1,10,00,000}{₹33,00,000} = 3.33$	9.00
4. $\text{Total Asset Turnover ratio} = \frac{\text{Sales}}{\text{Total Assets}}$	$\frac{₹1,10,00,000}{₹77,00,000} = 1.43$	2.00
5. $\text{Net Profit Ratio} = \frac{\text{Net Profit}}{\text{Sales}}$	$\frac{₹2,31,000}{₹1,10,00,000} = 2.10\%$	3.50%
6. $\text{Return on Total Asset} = \frac{\text{EBIT}}{\text{Total Assets}}$	$\frac{₹5,54,000}{₹77,00,000} = 7.19\%$	7%
7. $\text{Return on Net worth} = \frac{\text{Net Profit}}{\text{Net Worth}}$	$\frac{₹2,31,000}{₹48,00,000} = 4.81\%$	10.5%
8. $\frac{\text{Total Debt}}{\text{Total Assets}}$	$\frac{₹29,00,000}{₹77,00,000} = 37.66\%$	60%

Comments:

1. The position of Navya Ltd. is better than the industry norm with respect to Current Ratio and Receivables Turnover Ratio.
2. However, the Inventory turnover ratio and Total Asset Turnover ratio is poor comparing to industry norm indicating that company is inefficient to utilize its inventory and assets.
3. The firm also has its net profit ratio and return on net worth ratio much lower than the industry norm.
4. Total debt to total assets ratio is lower than the industry standard which suggests that the firm is less levered by debt and more by equity resulting in less risky company.

SUMMARY

- ◆ **Financial Analysis and its Tools:** For the purpose of obtaining the material and relevant information necessary for ascertaining the financial strengths and weaknesses of an enterprise, it is necessary to analyze the data depicted in the financial statement. The financial manager has certain analytical tools which help in financial analysis and planning. The main tools are Ratio Analysis and Cash Flow Analysis.
- ◆ **Ratio Analysis:** The ratio analysis is based on the fact that a single accounting figure by itself may not communicate any meaningful information but when expressed as a relative to some other figure, it may definitely provide some significant information. Ratio analysis is not just comparing different numbers from the balance sheet, income statement, and cash flow statement. It is comparing the number against previous years, other companies, the industry, or even the economy in general for the purpose of financial analysis.
- ◆ **Type of Ratios and Importance of Ratios Analysis:** The ratios can be classified into following four broad categories:
 - (i) Liquidity Ratios
 - (ii) Capital Structure/Leverage Ratios
 - (iii) Activity Ratios

(iv) Profitability Ratios

- ◆ A popular technique of analyzing the performance of a business concern is that of financial ratio analysis. As a tool of financial management, they are of crucial significance. The importance of ratio analysis lies in the fact that it presents facts on a comparative basis and enables drawing of inferences regarding the performance of a firm.
- ◆ Ratio analysis is relevant in assessing the performance of a firm in respect of following aspects:
 - I Liquidity Position
 - II Long-term Solvency
 - III Operating Efficiency
 - IV Overall Profitability
 - V Inter-firm Comparison
 - VI Financial Ratios for Supporting Budgeting

TEST YOUR KNOWLEDGE

Multiple Choice Questions (MCQs)

1. *Ratio of Net sales to Net working capital is a:*
 - (a) *Profitability ratio*
 - (b) *Liquidity ratio*
 - (c) *Current ratio*
 - (d) *Working capital turnover ratio*
2. *Long-term solvency is indicated by:*
 - (a) *Debt/equity ratio*
 - (b) *Current Ratio*
 - (c) *Operating ratio*
 - (d) *Net profit ratio*
3. *Ratio of net profit before interest and tax to sales is:*

- (a) *Gross profit ratio*
 - (b) *Net profit ratio*
 - (c) *Operating profit ratio*
 - (d) *Interest coverage ratio.*
4. *Observing changes in the financial variables across the years is:*
- (a) *Vertical analysis*
 - (b) *Horizontal Analysis*
 - (c) *Peer-firm Analysis*
 - (d) *Industry Analysis.*
5. *The Receivable-Turnover ratio helps management to:*
- (a) *Managing resources*
 - (b) *Managing inventory*
 - (c) *Managing customer relationship*
 - (d) *Managing working capital*
6. *Which of the following is a liquidity ratio?*
- (a) *Equity ratio*
 - (b) *Proprietary ratio*
 - (c) *Net Working Capital*
 - (d) *Capital Gearing ratio*
7. *Which of the following is not a part of Quick Assets?*
- (a) *Disposable investments*
 - (b) *Receivables*
 - (c) *Cash and Cash equivalents*
 - (d) *Prepaid expenses*

8. *Capital Gearing ratio is the fraction of:*
- Preference Share Capital and Debentures to Equity Share Capital and Reserve & Surplus.*
 - Equity Share Capital and Reserve & Surplus to Preference Share Capital and Debentures.*
 - Equity Share Capital to Total Assets.*
 - Total Assets to Equity Share Capital.*
9. *From the following information, calculate P/E ratio:*
- | | |
|---|-------------------|
| <i>Equity share capital of ₹ 10 each</i> | <i>₹ 8,00,000</i> |
| <i>9% Preference share capital of ₹ 10 each</i> | <i>₹ 3,00,000</i> |
| <i>Profit (after 35% tax)</i> | <i>₹ 2,67,000</i> |
| <i>Depreciation</i> | <i>₹ 67,000</i> |
| <i>Market price of equity share</i> | <i>₹ 48</i> |
- 15 times*
 - 16 times*
 - 17 times*
 - 18 times*
10. *Equity multiplier allows the investor to see:*
- What portion of interest on debt can be covered from earnings available to equity shareholders?*
 - How many times preference share interest be paid from earnings available to equity shareholders?*
 - What portion of return on equity is the result of debt?*
 - How many times equity is multiplied to get the value of debt?*

11. A company has average accounts receivable of ₹ 10,00,000 and annual credit sales of ₹ 60,00,000. Its average collection period would be:
- 60.83 days
 - 6.00 days
 - 1.67 days
 - 0.67 days
12. A company has net profit margin of 5%, total assets of ₹ 90,00,000 and return on assets of 9%. Its total asset turnover ratio would be:
- 1.6
 - 1.7
 - 1.8
 - 1.9
13. What does Q ratio measures?
- Relationship between market value and book value per equity share.
 - Proportion of profit available per equity share.
 - Overall earnings on average total assets.
 - Market value of equity as well as debt in comparison to all assets at their replacement cost.
14. Calculate operating expenses from the information given below:

Sales	₹ 75,00,000
Rate of income tax	50%
Net profit to sales	5%
Cost of goods sold	₹ 32,90,000
Interest on debentures	₹ 60,000

- ₹ 41,00,000
- ₹ 8,10,000
- ₹ 34,00,000
- ₹ 33,90,000

15. Which of the following is not a profitability ratio?

- (a) P/E ratio
- (b) Return on capital employed (ROCE)
- (c) Q Ratio
- (d) Preference Dividend Coverage Ratio

Theoretical Questions

1. DISCUSS any three ratios computed for investment analysis.
2. DISCUSS the financial ratios for evaluating company performance on operating efficiency and liquidity position aspects.
3. DISCUSS Stock Turnover ratio and Gearing ratio.
4. DISCUSS the composition of Return on Equity (ROE) using the DuPont model.
5. EXPLAIN briefly the limitations of Financial ratios.
6. DISCUSS DuPont Model.

Practical Problems

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

Equity share capital of ₹ 10 each	8,00,000
9% preference share capital of ₹ 10 each	3,00,000
	11,00,000

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

You are required to *COMPUTE* the following, showing the necessary workings:

- (a) Dividend yield on the equity shares
- (b) Cover for the preference and equity dividends
- (c) Earnings per shares
- (d) Price-earnings ratio

3. The following accounting information and financial ratios of PQR Ltd. relates to the year ended 31st March, 2023:

I	Accounting Information:	
	Gross Profit	15% of Sales
	Net profit	8% of sales
	Raw materials consumed	20% of works cost
	Direct wages	10% of works cost
	Stock of raw materials	3 months' usage
	Stock of finished goods	6% of works cost
	Debt collection period	60 days
	(All sales are on credit)	
II	Financial Ratios:	
	Fixed assets to sales	1 : 3
	Fixed assets to Current assets	13 : 11
	Current ratio	2 : 1
	Long-term loans to Current liabilities	2 : 1
	Share Capital to Reserves and Surplus	1 : 4

If value of Fixed Assets as on 31st March, 2022 amounted to ₹ 26 lakhs, *PREPARE* a summarised Profit and Loss Account of the company for the year ended 31st March, 2023 and also the Balance Sheet as on 31st March, 2023.

4. Ganpati Limited has furnished the following ratios and information relating to the year ended 31st March, 2023:

<i>Sales</i>	₹ 60,00,000
<i>Return on net worth</i>	25%
<i>Rate of income tax</i>	50%
<i>Share capital to reserves</i>	7:3
<i>Current ratio</i>	2
<i>Net profit to sales</i>	6.25%
<i>Inventory turnover (based on cost of goods sold)</i>	12
<i>Cost of goods sold</i>	₹ 18,00,000
<i>Interest on debentures</i>	₹ 60,000
<i>Receivables</i>	₹ 2,00,000
<i>Payables</i>	₹ 2,00,000

You are required to:

- CALCULATE the operating expenses for the year ended 31st March, 2023.
- PREPARE a Balance Sheet as on 31st March, 2023 in the following format:

Balance Sheet as on 31st March, 2023

Liabilities	₹	Assets	₹
<i>Share Capital</i>		<i>Fixed Assets</i>	
<i>Reserve and Surplus</i>		<i>Current Assets</i>	
<i>15% Debentures</i>		<i>Stock</i>	
<i>Payables</i>		<i>Receivables</i>	
		<i>Cash</i>	

- Using the following information, PREPARE the balance sheet:

<i>Long-term debt to net worth</i>	0.5
<i>Total asset turnover</i>	2.5
<i>Average collection period*</i>	18 days

<i>Inventory turnover</i>	9
<i>Gross profit margin</i>	10%
<i>Acid-test ratio</i>	1

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

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

6. Following information has been provided from the books of Laxmi Pvt. Ltd. for the year ending on 31st March, 2023:

<i>Net Working Capital</i>	₹ 4,80,000
<i>Bank overdraft</i>	₹ 80,000
<i>Fixed Assets to Proprietary ratio</i>	0.75
<i>Reserves and Surplus</i>	₹ 3,20,000
<i>Current ratio</i>	2.5
<i>Liquid ratio (Quick Ratio)</i>	1.5

You are required to PREPARE a summarised Balance Sheet as at 31st March, 2023 assuming that there is no long term debt.

7. Manan Pvt. Ltd. gives you the following information relating to the year ending 31st March, 2023:

(1) <i>Current Ratio</i>	2.5 : 1
(2) <i>Debt-Equity Ratio</i>	1 : 1.5
(3) <i>Return on Total Assets (After Tax)</i>	15%
(4) <i>Total Assets Turnover Ratio</i>	2

(5) Gross Profit Ratio	20%
(6) Stock Turnover Ratio	7
(7) Net Working Capital	₹ 13,50,000
(8) Fixed Assets	₹ 30,00,000
(9) 1,80,000 Equity Shares of	₹ 10 each
(10) 60,000, 9% Preference Shares of	₹ 10 each
(11) Opening Stock	₹ 11,40,000

You are required to CALCULATE:

- Quick Ratio
- Fixed Assets Turnover Ratio
- Proprietary Ratio
- Earnings per Share

8. Gig Ltd. has furnished the following information relating to the year ended 31st March, 2022 and 31st March, 2023:

	31st March, 2022 (₹)	31st March, 2023 (₹)
Share Capital	40,00,000	40,00,000
Reserve and Surplus	20,00,000	25,00,000
Long term loan	30,00,000	30,00,000

- ◆ Net profit ratio: 8%
- ◆ Gross profit ratio: 20%
- ◆ Long-term loan has been used to finance 40% of the fixed assets.
- ◆ Stock turnover with respect to cost of goods sold is 4.
- ◆ Debtors represent 90 days sales.
- ◆ The company holds cash equivalent to 1½ months cost of goods sold.
- ◆ Ignore taxation and assume 360 days in a year.

You are required to PREPARE Balance Sheet as on 31st March, 2023 in the following format:

Liabilities	(₹)	Assets	(₹)
Share Capital	-	Fixed Assets	-
Reserve and Surplus	-	Sundry Debtors	-
Long-term loan	-	Closing Stock	-
Sundry Creditors	-	Cash in hand	-

9. Following information relates to Temer Ltd.:

Debtors Velocity	3 months
Creditors Velocity	2 months
Stock Turnover Ratio	1.5
Gross Profit Ratio	25%
Bills Receivables	₹ 25,000
Bills Payables	₹ 10,000
Gross Profit	₹ 4,00,000
Fixed Assets turnover Ratio	4

Closing stock of the period is ₹ 10,000 above the opening stock.

DETERMINE:

- (i) Sales and cost of goods sold
 - (ii) Sundry Debtors
 - (iii) Sundry Creditors
 - (iv) Closing Stock
 - (v) Fixed Assets
10. From the following information and ratios, PREPARE the Balance sheet as at 31st March, 2023 and Income Statement for the year ended on that date for M/s Ganguly & Co -

Average Stock	₹10 lakh
Current Ratio	3:1
Acid Test Ratio	1:1
PBIT to PBT	2.2:1

<i>Average Collection period (Assume 360 days in a year)</i>	<i>30 days</i>
<i>Stock Turnover Ratio (Use sales as turnover)</i>	<i>5 times</i>
<i>Fixed assets turnover ratio</i>	<i>0.8 times</i>
<i>Working Capital</i>	<i>₹10 lakh</i>
<i>Net profit Ratio</i>	<i>10%</i>
<i>Gross profit Ratio</i>	<i>40%</i>
<i>Operating expenses (excluding interest)</i>	<i>₹ 9 lakh</i>
<i>Long term loan interest</i>	<i>12%</i>
<i>Tax</i>	<i>Nil</i>

11. From the following information, you are required to PREPARE a summarised Balance Sheet for Rudra Ltd. for the year ended 31st March, 2023:

<i>Debt Equity Ratio</i>	<i>1:1</i>
<i>Current Ratio</i>	<i>3:1</i>
<i>Fixed Asset Turnover (on the basis of sales)</i>	<i>4</i>
<i>Stock Turnover (on the basis of sales)</i>	<i>6</i>
<i>Cash in hand</i>	<i>₹ 5,00,000</i>
<i>Stock to Debtor</i>	<i>1:1</i>
<i>Sales to Net Worth</i>	<i>4</i>
<i>Capital to Reserve</i>	<i>1:2</i>
<i>Gross Profit</i>	<i>20% of Cost</i>
<i>COGS to Creditor</i>	<i>10:1</i>

Interest for entire year is yet to be paid on Long Term loan @ 10%.

Case Scenarios

1. RNOC Ltd is a listed company and has been facing a cash crunch situation since a while. The CFO is of the opinion that excess stock maintained as per the instructions of management of the company is the reason for cash crunch.

However, the management states that its product line requires larger amount of inventory due to greater variety of product line and customer may ask for any type of product. To maintain competitive advantage, the company should be able to cater to customer needs as and when required. The management is highly critical of the collection team as the management feels that they are not collecting the receivables within time as per industry standards.

You have been hired by the company as a financial consultant. Management has provided you the latest audited financial statements and also relevant industry statistics. You are required to advise the company to improve its liquidity position.

Statement of Profit and Loss		₹	₹
Sales			1,25,00,000
Cost of goods sold			
Opening Stock	23,00,000		
Add: Purchases	80,00,000		
Add: Direct expenses	12,00,000		
Less: Closing Stock	(38,60,000)		(76,40,000)
Gross Profit			48,60,000
Less: Operating Expenses			
Administrative Expenses	13,20,000		
Selling and Distribution Expenses	15,90,000		(29,10,000)
Operating Profit			19,50,000
Add: Non-Operating Income			3,28,000
Less: Non-Operating Expenses			(1,27,000)
Profit before Interest and taxes			21,51,000
Less: Interest			(4,39,000)
Profit before tax			17,12,000
Less: Taxes			(4,28,000)
Profit after Tax			12,84,000

Balance Sheet

Sources of Funds		₹	₹
Owned Funds	Equity Capital	30,00,000	
	Reserves and Surplus	18,00,000	48,00,000
Borrowed Funds	Secured Loan	10,00,000	
	Unsecured Loan	4,30,000	14,30,000
Total Funds Raised			62,30,000
Application of Funds			
Non-Current Assets	Building	7,50,000	
	Machinery	2,30,000	
	Furniture	7,60,000	
	Intangible Assets	50,000	17,90,000
Current Assets	Inventory	38,60,000	
	Receivables	39,97,000	
	ST investments	3,00,000	
	Cash and Bank	2,30,000	83,87,000
Less: Current Liabilities	Creditors	25,67,000	
	ST loans	13,80,000	(39,47,000)
Total Funds Employed			
			62,30,000

Industry Standards

Receivables Turnover	= 90 Days
Inventory Turnover	= 100 Days
Payables turnover	= 90 Days
Net Asset Turnover	= 4 Times

The company has set certain standards for the upcoming year financial status.

All the ratios are based on closing figures in financial statements.

Equity SC to Reserves	= 1
Net Profit Ratio	= 15%
Gross Profit Ratio	= 50%
loan Term Debt to Equity	= 0.5
Debtor Turnover	= 100 Days
Creditor Turnover (based on COGS)	= 100 Days
Inventory	= 70% of Opening inventory

Cash Balance is assumed to remain same for next year.

- (i) *What is the inventory turnover ratio in days and whether assertion of CFO is correct?*
- (a) *120 days; Assertion of CFO is correct.*
 - (b) *100 days; Assertion of CFO is incorrect.*
 - (c) *185 days; Assertion of CFO is correct.*
 - (d) *150 days; Assertion of CFO is incorrect.*
- (ii) *What is the receivables turnover and whether assertion of management is correct?*
- (a) *117 days; Assertion of management is correct.*
 - (b) *100 days; Assertion of management is correct.*
 - (c) *85 days; Assertion of management is correct.*
 - (d) *85 days; Assertion of management is not correct.*

- (iii) *What is the expense company needs to incur for earning ` 1 of revenue in the last year?*
- (a) 0.844
(b) 0.754
(c) 0.962
(d) 0.824
- (iv) *What is the projected net working capital of the company?*
- (a) ₹42,87,891
(b) ₹40,27,891
(c) ₹48,27,891
(d) ₹48,28,891
- (v) *What is the projected Long-Term Debt of the company for the next year?*
- (a) ₹60,00,000
(b) ₹30,00,000
(c) ₹14,30,000
(d) ₹28,60,000

ANSWERS/SOLUTION

Answers to the MCQs

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

Answers to the Theoretical Questions

1. Please refer paragraph 3.4.2
2. Please refer paragraph 3.4
3. Please refer paragraph 3.3 & 3.2

4. Please refer paragraph 3.4.2
5. Please refer paragraph 6
6. Please refer paragraph 3.4.2

Answers to the Practical Problems

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

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

$$\text{Cost of goods sold} = 0.85 \times ₹ 6,40,000 = ₹ 5,44,000.$$

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

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

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

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

Closing balance of receivables is found as follows:

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

$$\text{Average Receivables} = \frac{(\text{₹ } 1,76,000 + \text{₹ } 80,000)}{2} = ₹ 1,28,000$$

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

2. (a) Dividend yield on the equity shares

$$= \frac{\text{Dividend per share}}{\text{Market price per share}} \times 100 = \frac{\text{₹ 2 (i.e. } 0.20 \times \text{₹ 10)}}{\text{₹ 40}} \times 100 = 5\%$$

(b) Dividend coverage ratio

$$\begin{aligned} \text{(i) Preference} &= \frac{\text{Profit after taxes}}{\text{Dividend payable to preference shareholders}} \\ &= \frac{\text{₹ 2,70,000}}{\text{₹ 27,000 (i.e. } 0.09 \times \text{₹ 3,00,000)}} = 10 \text{ times} \end{aligned}$$

$$\begin{aligned} \text{(ii) Equity} &= \frac{\text{Profit after taxes - Preference share dividend}}{\text{Dividend payable to equity shareholders at current rate of ₹ 2 per share}} \\ &= \frac{\text{₹ 2,70,000 - ₹ 27,000}}{\text{₹ 1,60,000 (i.e. } 80,000 \text{ shares} \times \text{₹ 2)}} = 1.52 \text{ times} \end{aligned}$$

$$\begin{aligned} \text{(c) Earnings per equity share} &= \frac{\text{Earnings available to equity shareholders}}{\text{Number of equity shares outstanding}} \\ &= \frac{\text{₹ 2,43,000}}{80,000} = \text{₹ 3.04 per share} \end{aligned}$$

$$\begin{aligned} \text{(d) Price-earning (P/E) ratio} &= \frac{\text{Profit after taxes - Preference shares dividend}}{\text{Dividend payable to equity shareholders at current rate of ₹ 2 per share}} \\ &= \frac{\text{Market price per share}}{\text{Earnings per share}} = \frac{\text{₹ 40}}{\text{₹ 3.04}} = 13.2 \text{ times} \end{aligned}$$

3. (a) Working Notes:

$$\text{(i) Calculation of Sales} = \frac{\text{Fixed Assets}}{\text{Sales}} = \frac{1}{3}$$

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

(ii) Calculation of Current Assets

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

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

(iii) Calculation of Raw Material Consumption and Direct Wages

	₹
Sales	78,00,000
Less: Gross Profit @ 15%	11,70,000
Works Cost	66,30,000

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

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

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

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

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

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

(vi) Calculation of Current Liabilities

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

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

(vii) Calculation of Receivables

$$\begin{aligned} \text{Average collection period} &= \frac{\text{Receivables}}{\text{Credit Sales}} \times 365 \\ &= \frac{\text{Receivables}}{78,00,000} \times 365 = 60 \end{aligned}$$

Receivables = ₹ 12,82,191.78 or ₹ 12,82,192

(viii) Calculation of Long term Loan

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

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

(ix) Calculation of Cash Balance

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

(x) Calculation of Net worth

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

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

$$\text{Also, } \frac{1}{4} = \frac{\text{Share Capital}}{\text{Reserves and Surplus}}$$

$$\text{So, Share capital} = 15,00,000 \times \frac{1}{5} = ₹ 3,00,000;$$

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

**Profit and Loss Account of PQR Ltd.
for the year ended 31st March, 2023**

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

Balance Sheet of PQR Ltd.

as at 31st March, 2023

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

4. (a) Calculation of Operating Expenses for the year ended 31st March, 2023

		(₹)
Net Profit [@ 6.25% of Sales]		3,75,000
Add: Income Tax (@ 50%)		3,75,000
Profit Before Tax (PBT)		7,50,000
Add: Debenture Interest		60,000

Profit before interest and tax (PBIT)		8,10,000
Sales		60,00,000
Less: Cost of goods sold	18,00,000	
PBIT	8,10,000	26,10,000
Operating Expenses		33,90,000

(b) **Balance Sheet as on 31st March, 2023**

Liabilities	₹	Assets	₹
Share Capital	10,50,000	Fixed Assets	17,00,000
Reserve and Surplus	4,50,000	Current Assets:	
15% Debentures	4,00,000	Stock	1,50,000
Payables	2,00,000	Receivables	2,00,000
		Cash	50,000
	21,00,000		21,00,000

Working Notes:

- (i) Share Capital and Reserves and Surplus

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

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

$$\therefore \text{Net worth} = \frac{₹ 3,75,000 \times 100}{25} = ₹ 15,00,000$$

The ratio of share capital to reserves is 7:3

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

$$\text{Reserves and Surplus} = 15,00,000 \times \frac{3}{10} = ₹ 4,50,000$$

(ii) Debentures

$$\text{Interest on Debentures @ 15\%} = ₹ 60,000$$

$$\therefore \text{Debentures} = \frac{60,000 \times 100}{15} = ₹ 4,00,000$$

(iii) Current Assets

$$\text{Current Ratio} = 2$$

$$\text{Payables} = ₹ 2,00,000$$

$$\therefore \text{Current Assets} = 2 \text{ Current Liabilities} = 2 \times 2,00,000 \\ = ₹ 4,00,000$$

(iv) Fixed Assets

	₹
Share capital	10,50,000
Reserves and Surplus	4,50,000
Debentures	4,00,000
Payables	2,00,000
	21,00,000
Less: Current Assets	4,00,000
Fixed Assets	17,00,000

(v) Composition of Current Assets

$$\text{Inventory Turnover} = 12$$

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

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

Composition	₹
Stock	1,50,000

Receivables	2,00,000
Cash (balancing figure)	50,000
Total Current Assets	4,00,000

5. Working Notes:

(i) Long term Debt

$$0.5 = \frac{\text{Long-term debt}}{\text{Net worth}} = \frac{\text{Long-term debt}}{\text{₹1,00,000} + \text{₹1,00,000}}$$

$$\therefore \text{Long term debt} = \text{₹ 1,00,000}$$

(ii) Total assets

Total liabilities and Equity = Notes and payables + Long-term debt + Common stock + Retained earnings

$$= \text{₹ 1,00,000} + \text{₹ 1,00,000} + \text{₹ 1,00,000} + \text{₹ 1,00,000} = \text{₹ 4,00,000}$$

$$\therefore \text{Total assets} = \text{Total liabilities and Equity} = \text{₹ 4,00,000}$$

(iii) Sales and Cost of Goods sold

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

$$\therefore \text{Sales} = \text{₹ 10,00,000}$$

$$\begin{aligned} \text{Cost of goods sold} &= (100\% - \text{Gross Profit margin}) \times \text{Sales} \\ &= (100\% - 10\%) \times \text{₹ 10,00,000} = \text{₹ 9,00,000.} \end{aligned}$$

(iv) Current Assets

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

$$\therefore \text{Inventory} = \text{₹ 1,00,000}$$

$$\text{Average collection period} = 18 = \frac{\text{Receivables} \times 360}{\text{Sales}} = \frac{\text{Receivables} \times 360}{\text{₹10,00,000}}$$

$$\therefore \text{Accounts receivables} = \text{₹ 50,000}$$

$$\text{Acid-test ratio} = 1 = \frac{\text{Cash} + \text{Accounts Receivable}}{\text{Notes and Payables}} = \frac{\text{Cash} + \text{₹50,000}}{\text{₹1,00,000}}$$

$$\therefore \text{Cash} = ₹ 50,000$$

(v) Plant and equipment

$$= \text{Total Assets} - \text{Current Assets}$$

$$= ₹ 4,00,000 - (₹ 1,00,000 + ₹ 50,000 + ₹ 50,000) = ₹ 2,00,000$$

Balance Sheet

	₹		₹
Cash	50,000	Notes and payables	1,00,000
Accounts receivable	50,000	Long-term debt	1,00,000
Inventory	1,00,000	Common stock	1,00,000
Plant and equipment	2,00,000	Retained earnings	1,00,000
Total assets	4,00,000	Total liabilities and equity	4,00,000

6. Working notes:

(i) Computation of Current Assets and Current Liabilities

$$\frac{\text{Current assets}}{\text{Current liabilities}} = 2.5$$

$$\text{Current assets} = 2.5 \text{ Current liabilities}$$

$$\text{Now, Working capital} = \text{Current assets} - \text{Current liabilities}$$

$$₹ 4,80,000 = 2.5 \text{ Current liability} - \text{Current liability}$$

$$\text{Or, } 1.5 \text{ Current liability} = ₹ 4,80,000$$

$$\therefore \text{Current Liabilities} = ₹ 3,20,000$$

$$\text{So, Current Assets} = ₹ 3,20,000 \times 2.5 = ₹ 8,00,000$$

(ii) Computation of Inventories

$$\text{Liquid ratio} = \frac{\text{Liquid assets}}{\text{Current liabilities}}$$

$$1.5 = \frac{\text{Current assets} - \text{Inventories}}{₹ 3,20,000}$$

$$1.5 \times ₹ 3, 20,000 = ₹ 8,00,000 - \text{Inventories}$$

$$\text{Inventories} = ₹ 8,00,000 - ₹ 4, 80,000 = ₹ 3,20,000$$

(iii) Computation of Proprietary fund; Fixed assets; Capital and Sundry creditors

$$\text{Fixed Asset to Proprietary ratio} = \frac{\text{Fixed assets}}{\text{Proprietary fund}} = 0.75$$

$$\therefore \text{Fixed Assets} = 0.75 \text{ Proprietary fund}$$

$$\begin{aligned} \text{Proprietary fund} &= \text{Fixed Assets} + \text{Net Working Capital} - \\ &\quad \text{Long Term Debt} \end{aligned}$$

$$= 0.75 \text{ Proprietary fund} + ₹ 4,80,000 - 0$$

$$\therefore \text{Proprietary fund} = ₹ 19,20,000$$

$$\text{and Fixed Assets} = 0.75 \text{ proprietary fund}$$

$$= 0.75 \times ₹ 19,20,000 = ₹ 14,40,000$$

$$\text{Capital} = \text{Proprietary fund} - \text{Reserves \& Surplus}$$

$$= ₹ 19,20,000 - ₹ 3,20,000 = ₹ 16,00,000$$

$$\text{Sundry Creditors} = \text{Current liabilities} - \text{Bank overdraft}$$

$$= ₹ 3,20,000 - ₹ 80,000 = ₹ 2,40,000$$

Balance Sheet as on 31st March, 2023

Liabilities	₹	Assets	₹
Capital	16,00,000	Fixed Assets	14,40,000
Reserves & Surplus	3,20,000	Inventories	3,20,000
Bank overdraft	80,000	Other Current Assets	4,80,000
Sundry creditors	2,40,000	(Balancing figure)	
	22,40,000		22,40,000

7. Workings Notes:

(i) Computation of Current Assets & Current Liabilities & Total Assets

$$\text{Net Working Capital} = \text{Current Assets} - \text{Current Liabilities}$$

$$= 2.5 - 1 = 1.5$$

$$\begin{aligned}\text{Thus, Current Assets} &= \frac{\text{Net Working Capital} \times 2.5}{1.5} \\ &= \frac{\text{₹ } 13,50,000 \times 2.5}{1.5} = \text{₹ } 22,50,000\end{aligned}$$

$$\text{Current Liabilities (CL)} = \text{₹ } 22,50,000 - \text{₹ } 13,50,000 = \text{₹ } 9,00,000$$

$$\begin{aligned}\text{Total Assets} &= \text{Current Assets} + \text{Fixed Assets} \\ &= \text{₹ } 22,50,000 + \text{₹ } 30,00,000 = \text{₹ } 52,50,000\end{aligned}$$

(ii) **Computation of Sales & Cost of Goods Sold**

$$\begin{aligned}\text{Sales} &= \text{Total Assets Turnover} \times \text{Total Assets} \\ &= 2 \times (\text{Fixed Assets} + \text{Current Assets}) \\ &= 2 \times (\text{₹ } 30,00,000 + \text{₹ } 22,50,000) \\ &= \text{₹ } 1,05,00,000\end{aligned}$$

$$\begin{aligned}\text{Cost of Goods Sold} &= (100\% - 20\%) \text{ of Sales} = 80\% \text{ of Sales} \\ &= 80\% \times \text{₹ } 1,05,00,000 = \text{₹ } 84,00,000\end{aligned}$$

(iii) Computation of Stock & Quick Assets

$$\begin{aligned}\text{Average Stock} &= \frac{\text{Cost of Good Sold}}{\text{Stock Turnover Ratio}} = \frac{\text{₹ 84,00,000}}{7} \\ &= \text{₹ 12,00,000} \\ \text{Closing Stock} &= (\text{Average Stock} \times 2) - \text{Opening Stock} \\ &= (\text{₹ 12,00,000} \times 2) - \text{₹ 11,40,000} \\ &= \text{₹ 12,60,000} \\ \text{Quick Assets} &= \text{Current Assets} - \text{Closing Stock} \\ &= \text{₹ 22,50,000} - \text{₹ 12,60,000} = \text{₹ 9,90,000}\end{aligned}$$

(iv) Computation of Proprietary Fund

$$\begin{aligned}\text{Debt-Equity Ratio} &= \frac{\text{Debt}}{\text{Equity}} = \frac{1}{1.5} \\ \text{Or, Equity} &= 1.5 \text{ Debt} \\ \text{Total Assets} &= \text{Equity} + \text{Preference capital} + \text{Debt} + \text{CL} \\ \text{₹ 52,50,000} &= 1.5 \text{ Debt} + \text{₹ 6,00,000} + \text{Debt} + \text{₹ 9,00,000} \\ \text{Thus, Debt} &= \frac{\text{₹ 37,50,000}}{2.5} = \text{₹ 15,00,000} \\ \text{Equity} &= \text{₹ 15,00,000} \times 1.5 = \text{₹ 22,50,000} \\ \text{So, Proprietary Fund} &= \text{Equity} + \text{Preference Capital} \\ &= \text{₹ 22,50,000} + \text{₹ 6,00,000} \\ &= \text{₹ 28,50,000}\end{aligned}$$

(v) Computation of Profit after tax (PAT)

$$\begin{aligned}&= \text{Total Assets} \times \text{Return on Total Assets} \\ &= \text{₹ 52,50,000} \times 15\% \\ &= \text{₹ 7,87,500}\end{aligned}$$

(a) Quick Ratio

$$\text{Quick Ratio} = \frac{\text{Quick Assets}}{\text{Current Liabilities}} = \frac{\text{₹ 9,90,000}}{\text{₹ 9,00,000}} = 1.1$$

(b) Fixed Assets Turnover Ratio

$$\text{Fixed Assets Turnover Ratio} = \frac{\text{Sales}}{\text{Fixed Assets}} = \frac{\text{₹ 1,05,00,000}}{\text{₹ 30,00,000}} = 3.5$$

(c) Proprietary Ratio

$$\text{Proprietary Ratio} = \frac{\text{Proprietary fund}}{\text{Total Assets}} = \frac{\text{₹ 28,50,000}}{\text{₹ 52,50,000}} = 0.54$$

(d) Earnings per Equity Share (EPS)

$$\begin{aligned} \text{Earnings per Equity Share} &= \frac{\text{PAT - Preference Share Dividend}}{\text{Number of Equity Shares}} \\ &= \frac{\text{₹ 7,87,500} - \text{₹ 54,000 (9\% of ₹ 6,00,000)}}{1,80,000} \\ &= \text{₹ 4.075 per share} \end{aligned}$$

8. (i) Change in Reserve & Surplus = ₹ 25,00,000 – ₹ 20,00,000 = ₹ 5,00,000

So, Net profit = ₹ 5,00,000

Net Profit Ratio = 8%

$$\therefore \text{Sales} = \frac{5,00,000}{8\%} = \text{₹ 62,50,000}$$

(ii) Cost of Goods sold

= Sales – Gross profit Margin

= ₹ 62,50,000 – 20% of ₹ 62,50,000

= ₹ 50,00,000

$$\text{(iii) Fixed Assets} = \frac{\text{₹ 30,00,000}}{40\%} = \text{₹ 75,00,000}$$

$$\text{(iv) Stock} = \frac{\text{Cost of Goods Sold}}{\text{Stock Turnover ratio}} = \frac{50,00,000}{4} = \text{₹ 12,50,000}$$

$$(v) \quad \text{Debtors} = \frac{62,50,000}{360} \times 90 = ₹ 15,62,500$$

$$(vi) \quad \text{Cash Equivalent} = \frac{50,00,000}{12} \times 1.5 = ₹ 6,25,000$$

Balance Sheet as on 31st March 2023

Liabilities	(₹)	Assets	(₹)
Share Capital	40,00,000	Fixed Assets	75,00,000
Reserve and Surplus	25,00,000	Sundry Debtors	15,62,500
Long-term loan	30,00,000	Closing Stock	12,50,000
Sundry Creditors (Balancing Figure)	14,37,500	Cash in hand	6,25,000
	1,09,37,500		1,09,37,500

9. (i) Determination of Sales and Cost of goods sold:

$$\text{Gross Profit Ratio} = \frac{\text{Gross Profit}}{\text{Sales}} \times 100$$

$$\text{Or, } \frac{25}{100} = \frac{₹ 4,00,000}{\text{Sales}}$$

$$\text{Or, Sales} = \frac{4,00,00,000}{25} = ₹ 16,00,000$$

$$\text{Cost of Goods Sold} = \text{Sales} - \text{Gross Profit}$$

$$= ₹ 16,00,000 - ₹ 4,00,000 = ₹ 12,00,000$$

(ii) Determination of Sundry Debtors:

Debtors' velocity is 3 months or Debtors' collection period is 3 months,

$$\text{So, Debtors' turnover ratio} = \frac{12 \text{ months}}{3 \text{ months}} = 4$$

$$\text{Debtors' turnover ratio} = \frac{\text{Credit Sales}}{\text{Average Accounts Receivable}}$$

$$= \frac{₹ 16,00,000}{\text{Bills Receivable} + \text{Sundry Debtors}} = 4$$

Or, Sundry Debtors + Bills receivable = ₹ 4,00,000

Sundry Debtors = ₹ 4,00,000 – ₹ 25,000 = ₹ 3,75,000

(iii) Determination of Sundry Creditors:

Creditors' velocity of 2 months or credit payment period is 2 months.

$$\text{So, Creditors' turnover ratio} = \frac{12 \text{ months}}{2 \text{ months}} = 6$$

$$\begin{aligned} \text{Creditors turnover ratio} &= \frac{\text{Credit Purchases}^*}{\text{Average Accounts Payables}} \\ &= \frac{₹ 12,10,000}{\text{Sundry Creditors} + \text{Bills Payables}} = 6 \end{aligned}$$

So, Sundry Creditors + Bills Payable = ₹ 2,01,667

Or, Sundry Creditors + ₹ 10,000 = ₹ 2,01,667

Or, Sundry Creditors = ₹ 2,01,667 – ₹ 10,000 = ₹ 1,91,667

(iv) Determination of Closing Stock

$$\text{Stock Turnover Ratio} = \frac{\text{Cost of Goods Sold}}{\text{Average Stock}} = \frac{₹ 12,00,000}{\text{Average Stock}} = 1.5$$

So, Average Stock = ₹ 8,00,000

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

$$\text{Or } \frac{\text{Opening Stock} + (\text{Opening Stock} + ₹ 10,000)}{2} = ₹ 8,00,000$$

Or, Opening Stock = ₹ 7,95,000

So, Closing Stock = ₹ 7,95,000 + ₹ 10,000 = ₹ 8,05,000

(v) Determination of Fixed Assets

$$\text{Fixed Assets Turnover Ratio} = \frac{\text{Cost of Goods Sold}}{\text{Fixed Assets}} = 4$$

$$\text{Or,} \quad = \frac{₹12,00,000}{\text{Fixed Assets}} = 4$$

$$\text{Or,} \quad \text{Fixed Asset} = ₹ 3,00,000$$

Workings:

***Calculation of Credit purchases:**

Cost of goods sold = Opening stock + Purchases – Closing stock

$$₹ 12,00,000 = ₹ 7,95,000 + \text{Purchases} - ₹ 8,05,000$$

$$₹ 12,00,000 + ₹ 10,000 = \text{Purchases}$$

$$₹ 12,10,000 = \text{Purchases (credit)}$$

Assumption:

- (i) All sales are credit sales
- (ii) All purchases are credit purchase
- (iii) Stock Turnover Ratio and Fixed Asset Turnover Ratio may be calculated either on Sales or on Cost of Goods Sold.

10. 1. Current Ratio = 3:1

$$\text{Current Assets (CA)/Current Liability (CL)} = 3:1$$

$$\text{CA} = 3\text{CL}$$

$$\text{WC} = 10,00,000$$

$$\text{CA} - \text{CL} = 10,00,000$$

$$3\text{CL} - \text{CL} = 10,00,000$$

$$2\text{CL} = 10,00,000$$

$$\text{CL} = \frac{10,00,000}{2}$$

$$\text{CL} = ₹5,00,000$$

$$\text{CA} = 3 \times 5,00,000$$

$$\text{CA} = ₹15,00,000$$

2. Acid Test Ratio = CA – Stock / CL = 1:1

$$= \frac{15,00,000 - \text{Stock}}{5,00,000} = 1$$

$$15,00,000 - \text{stock} = 5,00,000$$

$$\text{Stock} = ₹10,00,000$$

3. Stock Turnover ratio (on sales) = 5

$$\frac{\text{Sales}}{\text{Avg stock}} = 5$$

$$\frac{\text{Sales}}{10,00,000} = 5$$

$$\text{Sales} = ₹50,00,000$$

4. Gross Profit = 50,00,000 x 40% = ₹20,00,000

$$\text{Net profit (PBT)} = 50,00,000 \times 10\% = ₹5,00,000$$

5. PBIT/PBT = 2.2

$$\text{PBIT} = 2.2 \times 5,00,000$$

$$\text{PBIT} = 11,00,000$$

$$\text{Interest} = 11,00,000 - 5,00,000 = ₹6,00,000$$

$$\text{Long term loan} = \frac{6,00,000}{0.12} = ₹50,00,000$$

6. Average collection period = 30 days

$$\text{Receivables} = \frac{30}{360} \times 50,00,000 = 4,16,667$$

7. Fixed Assets Turnover Ratio = 0.8

$$50,00,000 / \text{Fixed Assets} = 0.8$$

$$\text{Fixed Assets} = ₹62,50,000$$

Income Statement

	(₹)
Sales	50,00,000
Less: Cost of Goods Sold	30,00,000
Gross Profit	20,00,000
Less: Operating Expenses	9,00,000
Less: Interest.	6,00,000
Net Profit	5,00,000

Balance sheet

Liabilities	(₹)	Assets	(₹)
Equity share capital	22,50,000	Fixed asset	62,50,000
Long term debt	50,00,000	Current assets:	
Current liability	5,00,000	Stock 10,00,000	
		Receivables 4,16,667	
		Other <u>83,333</u>	15,00,000
	77,50,000		77,50,000

11.

Balance Sheet of Rudra Ltd.

Liabilities	(₹)	Assets	(₹)
Capital	10,00,000	Fixed Assets	30,00,000
Reserves	20,00,000	Current Assets:	
Long Term Loan @ 10%	30,00,000	Stock in Trade	20,00,000
Current Liabilities:		Debtors	20,00,000
Creditors	10,00,000	Cash	5,00,000
Other Short-term	2,00,000		

Current Liability (Other STCL)			
Outstanding Interest	3,00,000		
	75,00,000		75,00,000

Working Notes:

Let sales be ₹ x

Balance Sheet of Rudra Ltd.

Liabilities	(₹)	Assets	(₹)
Capital		Fixed Assets	x/4
Reserves		Current Assets:	
Net Worth	x/4	Stock in Trade	x/6
Long Term Loan @ 10%	x/4	Debtors	x/6
		Cash	5,00,000
Current liabilities:			
Creditors	x/12		
Other Short-term Current Liability			
Outstanding Interest			
Total Current Liabilities	x/9+5,00,000/3		
Total		Total	

$$1. \quad \text{Fixed Asset Turnover} = 4 = \frac{x}{\text{Fixed Assets}}$$

$$\text{Fixed Assets} = \frac{x}{4}$$

$$2. \quad \text{Stock Turnover} = 6 = \frac{x}{\text{stock}}$$

$$\text{Stock} = \frac{x}{6}$$

3. Sales to net worth = 4 $= \frac{x}{\text{net worth}}$
- Net worth $= \frac{x}{4}$
4. Debt: Equity = 1 : 1
- $\frac{\text{Long Term Loan}}{\text{Net worth}} = \frac{1}{1}$
- Long term loan = Net worth $= \frac{x}{4}$
5. Gross Profit to Cost = 20%
- $\frac{\text{GP}}{\text{Sales} - \text{GP}} = 20\%$
- $\frac{\text{GP}}{x - \text{GP}} = 20\%$
- GP $= 0.2x - 0.2 \text{ GP}$
- 1.2 GP $= 0.2x$
- G P $= \frac{0.2x}{1.2}$
- G P $= x/6$
- Cost of Goods Sold $= x - x/6 = 5/6 x$
6. COGS to creditors = 10:1
- $\frac{\text{COGS}}{\text{Creditors}} = \frac{10}{1}$
- $\frac{\frac{5}{6}x}{\text{creditors}} = \frac{10}{1}$
- Creditors $= \frac{5x}{60} = \frac{x}{12}$

$$7. \quad \frac{\text{Stock}}{\text{Debtor}} = 1$$

$$\text{Debtor} = \text{Stock} = \frac{x}{6}$$

$$8. \quad \text{Current Ratio} = 3 : 1$$

$$\frac{\text{Stock} + \text{Debtors} + \text{Cash}}{\text{Current Liabilities}} = \frac{3}{1}$$

$$\frac{\frac{x}{6} + \frac{x}{6} + 5,00,000}{\text{Current Liabilities}} = 3$$

$$\frac{\frac{x}{3} + 5,00,000}{3} = \text{CL}$$

$$\text{CL} = \frac{x}{9} + \frac{5,00,000}{3}$$

$$9. \quad \text{CA} = 3\text{CL}$$

$$= 3 \left(\frac{x}{9} + \frac{₹ 5,00,000}{3} \right)$$

$$\text{CA} = \frac{x}{3} + 5,00,000$$

$$10. \quad \text{Net worth} + \text{Long Term Loan} + \text{Current Liability} = \text{Fixed Asset} + \text{Current Assets}$$

$$\frac{x}{4} + \frac{x}{4} + \frac{x}{9} + \frac{₹ 5,00,000}{3} = \frac{x}{4} + \frac{x}{3} + ₹ 5,00,000$$

$$\frac{x}{4} + \frac{x}{9} - \frac{x}{3} = ₹ 5,00,000 - \frac{₹ 5,00,000}{3}$$

$$\frac{9x + 4x - 12x}{36} = \frac{₹ 15,00,000 - ₹ 5,00,000}{3}$$

$$\frac{x}{36} = \frac{₹ 10,00,000}{3}$$

$$x = ₹ 1,20,00,000$$

11. Now, from above calculations, we get,

$$\text{Fixed Asset} = \frac{x}{4} = \frac{\text{₹ } 1,20,00,000}{4} = \text{₹ } 30,00,000$$

$$\text{Stock} = \frac{x}{6} = \frac{\text{₹ } 1,20,00,000}{6} = \text{₹ } 20,00,000$$

$$\text{Debtor} = \frac{x}{6} = \frac{\text{₹ } 1,20,00,000}{6} = \text{₹ } 20,00,000$$

$$\text{Net Worth} = x / 4 = \text{₹ } 30,00,000$$

Now, Capital to Reserve is 1 : 2

$$\text{Capital} = \text{₹ } 10,00,000$$

$$\text{and, Reserve} = \text{₹ } 20,00,000$$

$$\text{Long Term Loan} = \frac{x}{4} = 30,00,000$$

$$\text{Outstanding Interest} = 30,00,000 \times 10\% = 3,00,000$$

$$\text{Creditors} = \frac{x}{12} = \frac{\text{₹ } 1,20,00,000}{12} = \text{₹ } 10,00,000$$

Current Liabilities = Creditors + Other STCL + Outstanding Interest

$$\frac{x}{9} + \frac{\text{₹ } 5,00,000}{3} = \text{₹ } 10,00,000 + \text{Other STCL} + \text{₹ } 3,00,000$$

$$\frac{\text{₹ } 1,20,00,000}{9} + \frac{\text{₹ } 5,00,000}{3} = \text{₹ } 13,00,000 + \text{Other STCL}$$

$$\text{₹ } 15,00,000 = \text{Other STCL} + \text{₹ } 13,00,000$$

$$\text{Other STCL} = \text{₹ } 2,00,000$$

Answers to the Case Scenarios

1.

i.	(c)	ii.	(a)	iii.	(a)	iv.	(b)	v.	(b)
-----------	-----	------------	-----	-------------	-----	------------	-----	-----------	-----

i. (c) $\text{Inventory Turnover} = \frac{\text{Inventory}}{\text{COGS}} \times 365 = \frac{38,60,000}{76,40,000} \times 365$
 $= 184.41 \text{ days} = 185 \text{ days (apx)}$

Inventory holding period of 185 days is significantly higher as compared to industry standard of 100 days. This means a significant amount of working capital is tied in inventory, which may be leading to liquidity crunch.

$$\text{ii. (a) Receivables Turnover} = \frac{\text{Receivables}}{\text{Sales}} \times 365 = \frac{39,79,000 \times 365}{1,25,00,000} \\ = 116.71 = 117 \text{ days (apx)}$$

Receivables turnover of 117 days as compared to industry standard of 90 days is a further delay of 27 days. This will lead to good amount of money being tied up in debtors.

- iii. (a) Operating Ratio is the number which indicates cost incurred by company for earning each rupee of revenue

$$\text{Operating Ratio} = \frac{\text{COGS} + \text{Operating Expenses}}{\text{Sales}} \times 100 \\ = \frac{76,40,000 + 29,10,000}{1,25,00,000} \times 100 = 0.844$$

$$\begin{aligned} \text{iv. (b) Equity to Reserves} &= 1 \\ \text{Reserves} &= 1 \times 30,00,000 = ₹ 30,00,000 \\ \text{Projected profit} &= 30,00,000 - 18,00,000 = ₹ 12,00,000 \\ \text{Net Profit Margin} &= 15\% \\ 12,00,000 / \text{Sales} &= 0.15 \\ \text{Sales} &= ₹ 80,00,000 \\ \text{Gross Profit} &= 80,00,000 \times 50\% = ₹ 40,00,000 \\ \text{COGS} &= 80,00,000 - 40,00,000 = ₹ 40,00,000 \\ \text{Projected Debtors Turnover} &= 100 \text{ days} = \frac{\text{closing Receivables}}{\text{Sales}} \times 365 \\ 100 &= \frac{\text{Closing Receivables}}{80,00,000} \times 365 \end{aligned}$$

$$\text{Closing Receivables} = 80,00,000 \times 100 / 365 = ₹ 21,91,781$$

$$\begin{aligned} \text{Projected Closing Inventory} &= 70\% \text{ of opening inventory} \\ &= 70\% \text{ of } 38,60,000 = ₹ 27,02,000 \end{aligned}$$

$$\begin{aligned} \text{Projected Creditor Turnover} &= 100 \text{ days} \\ &= \text{closing creditors} / \text{COGS} \times 365 \end{aligned}$$

$$\text{Closing Creditors} = \text{COGS} \times 100 / 365$$

$$\text{Closing Creditor} = 40,00,000 \times 100 / 365 = ₹ 10,95,890$$

$$\begin{aligned} \text{Net Working Capital} &= \text{Cash} + \text{Debtors} + \text{Inventory} - \\ &\quad \text{Creditors} \\ &= 2,30,000 + 21,91,781 + 27,02,000 - \\ &\quad 10,95,890 \end{aligned}$$

$$\text{Net Working Capital} = ₹ 40,27,891$$

$$\begin{aligned} \text{v. (b) Equity Share Capital + Reserves} &= 30,00,000 + 30,00,000 \\ &= ₹ 60,00,000 \end{aligned}$$

$$\text{Long Term Debt to Equity} = 0.5$$

$$\text{LTD} / 60,00,000 = 0.5$$

$$\text{Long Term Debt} = 0.5 \times 60,00,000$$

$$\text{Long Term Debt} = ₹ 30,00,000$$

COST OF CAPITAL

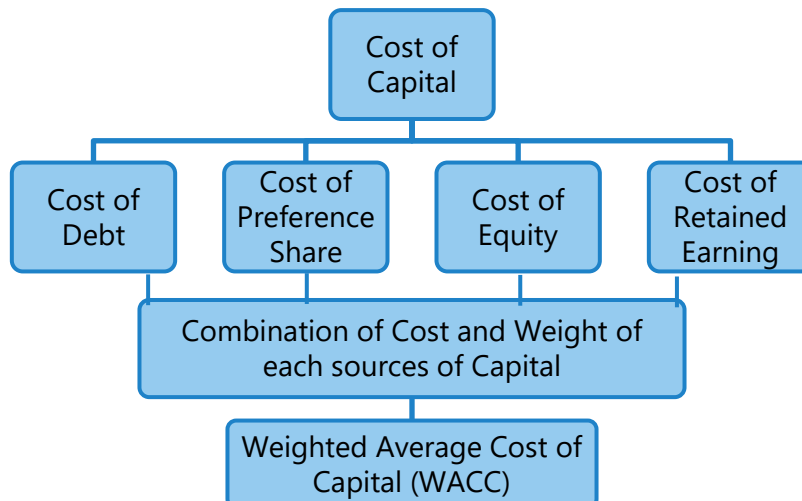


LEARNING OUTCOMES

After studying this chapter, you would be able to -

- ◆ Discuss the need and sources of finance of a business entity.
- ◆ Discuss the meaning of cost of capital for raising fund from different sources of finance.
- ◆ Measure cost of individual components of capital.
- ◆ Calculate weighted cost of capital and marginal cost of capital.

CHAPTER OVERVIEW





1. INTRODUCTION

We know that the basic task of a finance manager is procurement of funds and its effective utilization in business. Whereas objective of financial management is maximization of wealth of shareholders. Here wealth or value is equal to performance divided by expectations.

Therefore, the finance manager is required to select such a capital structure in which expectation of investors is minimum hence shareholders' wealth is maximum. For that purpose, first he needs to calculate the cost of various sources of finance. In this chapter, we will learn to calculate cost of debt, cost of preference shares, cost of equity shares, cost of retained earnings and also the overall cost of capital.



2. MEANING OF COST OF CAPITAL

Cost of capital is the return expected by the providers of capital (i.e. shareholders, lenders and the debt-holders) to the business as a compensation for their contribution to the total capital. When an entity (corporate or others) procures finances from either source as listed above, it has to pay some additional amount of money besides the principal amount. The additional money paid to these financiers may be either one off payment or regular payment at specified intervals. This additional money paid is said to be the cost of using the capital and it is called the cost of capital. This cost of capital expressed in rate is used to discount/ compound the cash flow or stream of cash flows. Cost of capital is also known as 'cut-off' rate, 'hurdle rate', 'minimum rate of return', etc. It is used as a benchmark for:

- ◆ Framing debt policies of an entity
- ◆ Taking Capital budgeting decisions.



3. SIGNIFICANCE OF COST OF CAPITAL

It is important to determine the correct amount of cost of capital as it helps management and investors to take an appropriate decision.

The correct cost of capital helps in the following decision making:

- (i) **Evaluation of investment options:** The estimated benefits (future cash flows) from available investment opportunities (business or project) are converted into the present value of benefits by **discounting them with the relevant cost of capital**. Here it is pertinent to mention that every investment option may have different cost of capital hence it is very important to use the cost of capital which is relevant to the options available.
- (ii) **Financing Decision:** When a finance manager has to choose between one of the two sources of finance, he can simply compare their cost and choose the source which has lower cost. Besides cost, he may also consider financial risk and control.
- (iii) **Designing of optimum credit policy:** While appraising the credit period to be allowed to the customers, the cost of allowing credit period is compared against the benefit/ profit earned by providing credit to customers or segments of customers. Here cost of capital is used to arrive at the present value of costs and benefits received.



4. DETERMINATION OF COST OF CAPITAL

Cost is not the amount which the company plans to pay or actually pays, rather it is the expectations of stakeholders. Here, stakeholders includes providers of capital (shareholders, debenture holder, money lenders etc.), intermediaries (brokers, underwriters, merchant bankers etc.), and Government (for taxes).

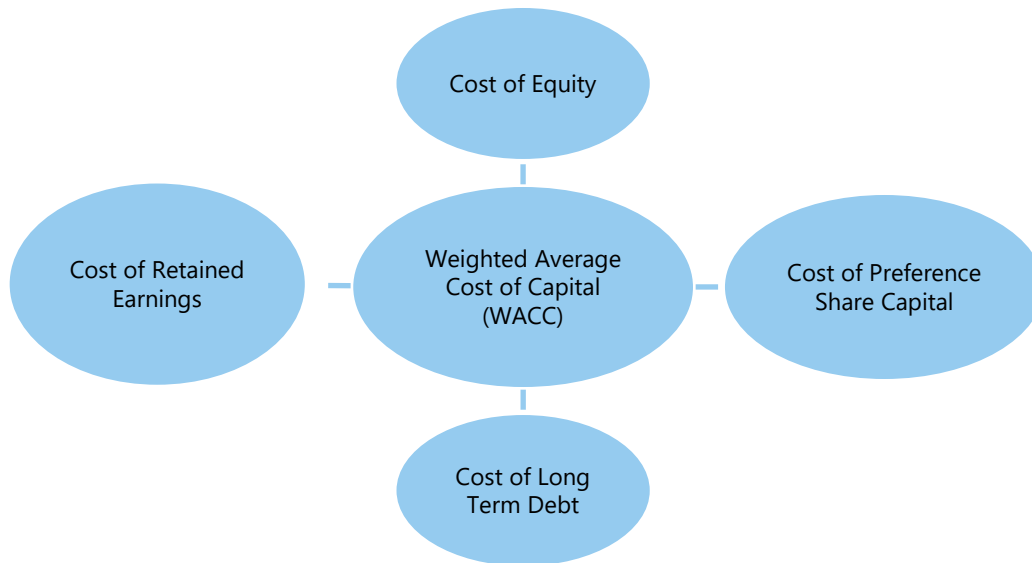
For example, if the company issues 9% coupon debentures but expectation of investors is 10% then investors will subscribe it at discount and not at par. Hence cost to the company will not be 9%, rather than it will be 10%. Besides giving return to investors, company will also have to give commission, brokerage, fees etc. to intermediaries for issue of debentures. It will increase cost of capital above 10%. On the other hand, payment of interest is a deductible expense under the Income Tax Act hence, it will reduce cost of capital to the company. Cost of any sources of finance is expressed in terms of percentage per annum. To calculate cost first of all we should identify various cash flows like:

1. Inflow of amount received at the beginning.

2. Outflows of payment of interest, dividend, redemption amount etc.
3. Inflow of tax benefit on interest or Outflow of payment of dividend tax.

Thereafter we can use trial & error method to arrive at a rate where present value of outflows is equal to present value of inflows. That rate is basically IRR. In investment decisions, IRR indicates income because there we have initial outflow followed by series of inflows. In cost of capital chapter, this **IRR represents cost**, because here we have initial inflow followed by series of net outflows.

Alternatively, we can use shortcut formulas. Though these shortcut formulas are easy to use but they give approximate answer and not the exact answer. We will discuss the cost of capital of each source of finance separately.



Factors of Cost of Capital:

In General, some of the factors may affect the Cost of Capital:

- ♦ **Supply and Demand:** Just like any good, the cost of capital is influenced by supply and demand. When there are lots of exciting business opportunities, there's more competition for funding, driving the cost of capital up. On the other hand, when opportunities are scarce, investors are more willing to lend at lower rates.
- ♦ **Investor Preferences:** Cultural factors and personal savings habits play a role. Some societies save more than others, affecting the overall pool of available capital. Additionally, the potential returns offered by investments

influence how much people save and invest. Higher returns generally lead to more savings.

- ♦ **Risk and Return:** There's always a trade-off between risk and reward. Businesses with high-risk ventures need to offer investors a higher potential return to compensate for the risk they're taking. However, if the cost of capital becomes too high, it can make the project unprofitable.
- ♦ **Inflation:** Investors want their money to grow, not shrink. To keep pace with inflation, they look for investments that offer returns that outpace inflation, so their money retains its buying power.
- ♦ **Exchange Rates:** For multinational companies, fluctuations in exchange rates can add an extra layer of risk and affect the overall cost of capital.



5. COST OF LONG-TERM DEBT (K_D)

External borrowings or debt instruments do not confer ownership to the providers of finance. The providers of the debt fund do not participate in the affairs of the company but enjoys the charge on the profit before taxes. Long term debt includes long term loans from the financial institutions, capital from issuing debentures or bonds etc. (In Chapter-2, we had already discussed in detail about the sources of long-term debt.)

The calculation of cost of loan from a financial institution is similar to that of redeemable debentures. Here, we will confine our discussion of cost of debt to debentures or bonds only.

5.1 Features of Debentures or Bonds

- (i) **Face Value:** Debentures or bonds are denominated with some value, this denominated value is called face value of the debenture. Interest is calculated on the face value of the debenture. E.g. if a company issue 9% non-convertible debentures of ₹100 each, this means the face value is ₹ 100 and the interest @ 9% will be calculated on this face value.
- (ii) **Interest (Coupon) Rate:** Each debenture bears a fixed interest (coupon) rate (except Zero coupon bond and Deep discount bond). Interest (coupon) rate is applied to face value of debenture to calculate interest, which is

payable to the holders of debentures periodically (annually, semi-annually, etc.).

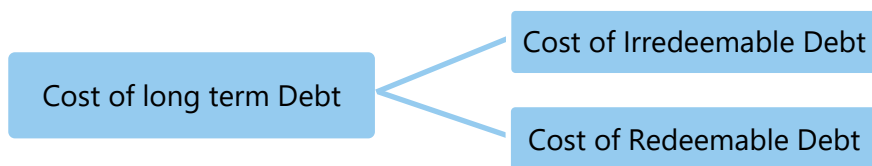
- (iii) **Maturity period:** Debentures or Bonds has a fixed maturity period for redemption. However, in case of irredeemable debentures maturity period is not defined and it is taken as infinite.
- (iv) **Redemption Value:** Redeemable debentures or bonds are redeemed on its specified maturity date. Based on the debt covenants, the redemption value is determined. Redemption value may vary from the face value of the debenture.
- (v) **Benefit of tax shield:** The payment of interest to the debenture holders are allowed as expenses for the purpose of corporate tax determination. Hence, interest paid to the debenture holders save the tax liability of the company. Saving in the tax liability is also known as tax shield. The example given below will show you how interest paid by a company reduces the tax liability:

Example - 1: There are two companies namely X Ltd. and Y Ltd. The capital of the X Ltd. is fully financed by the equity shareholders whereas Y Ltd. uses debt fund as well. Given below is the profitability statement of both the companies:

	X Ltd. (₹ in lakh)	Y Ltd. (₹ in lakh)
Earnings before interest and taxes (EBIT)	100	100
Interest paid to debenture holders	-	(40)
Profit before tax (PBT)	100	60
Tax @ 35%	(35)	(21)
Profit after tax (PAT)	65	39

A comparison of the two companies shows that an interest payment of ₹ 40 by the Y Ltd. results in a tax shield (tax saving) of ₹14 lakh (₹ 40 lakh paid as interest × 35% tax rate). Therefore, the effective interest is ₹ 26 lakh only.

Based on redemption (repayment of principal) on maturity the debts can be categorised into two types (i) Irredeemable debts and (ii) Redeemable debts.



5.2 Cost of Irredeemable Debentures

The debentures which are not redeemed by the issuer of the debentures is known as irredeemable debentures. Cost of debentures not redeemable during the life time of the company is calculated as below:

$$K_d = \frac{I}{NP}(1-t)$$

Where,

- K_d = Cost of debt after tax
- I = Annual interest payment
- NP = Net proceeds of debentures or Current market price
- t = Tax rate

Net proceeds means issue price less issue expenses or floatation cost (defined below). If issue price is not given, then students can assume it to be equal to current market price. If issue expenses are not given, then simply assume it to be equal to zero.

Floatation Cost: The new issue of a security (debt or equity) involves some expenditure in the form of underwriting or brokerage fees, legal and administrative charges, registration fees, printing expenses etc. The sum of all these costs is known as floatation cost. This expenditure is incurred to make the securities available to the investors. Floatation cost is adjusted to arrive at net proceeds for the calculation of cost of capital.

Suppose a company issues 1,000, 15% debentures of the face value of ₹100 each at a discount of ₹5. Further suppose that the under-writing and other costs are ₹ 5,000 for the total issue. Thus ₹ 90,000 is actually realised, i.e., ₹ 1,00,000 minus ₹ 5,000 as discount and ₹ 5,000 as under-writing expenses. The interest amount payable per annum of ₹15,000 is therefore the cost of obtaining ₹ 90,000 actually received by the company. This is because interest is charged on profit and every

year the company will save ₹ 7,500 as tax, assuming that the income tax rate is 50%. Hence the after-tax cost of ₹ 90,000 is ₹ 7,500 which comes to 8.33%.

ILLUSTRATION 1

Five years ago, Sona Limited issued 12 per cent irredeemable debentures at ₹ 103, at ₹ 3 premium to their par value of ₹ 100. The current market price of these debentures is ₹ 94. If the company pays corporate tax at a rate of 35 per cent CALCULATE its current cost of debenture capital?

SOLUTION

Cost of irredeemable debenture:

$$K_d = \frac{I}{NP}(1-t)$$

$$K_d = \frac{\text{₹ } 12}{\text{₹ } 94}(1-0.35) = 0.08297 \text{ or } 8.30\%$$

5.3 Cost of Redeemable Debentures (using approximation method)

The cost of redeemable debentures will be calculated as below:

$$\text{Cost of Redeemable Debenture (K}_d\text{)} = \frac{I(1-t) + \frac{(RV-NP)}{n}}{\frac{(RV+NP)}{2}}$$

Where,

- I = Interest payment
- NP = Net proceeds or Current market price
- RV = Redemption value of debentures
- t = Tax rate applicable to the company
- n = Remaining life of debentures

The above formula to calculate cost of debt is used where only interest on debt is tax deductible. Sometime, debts are issued at discount and/ or redeemed at a

premium. If discount on issue and/ or premium on redemption are tax deductible, the following formula can be used to calculate the cost of debt:

$$\text{Cost of Redeemable Debenture (K}_d\text{)} = \frac{I + \frac{(RV - NP)}{n}}{\frac{(RV + NP)}{2}} (1 - t)$$

In absence of any specific information, students may use any of the above formulae to calculate the Cost of Debt (K_d) with logical assumption.

Above formulas give approximate value of cost of debt. In these formulas, higher the difference between RV and NP, lower the accuracy of answer. Therefore, one should not use these formulas if difference between RV and NP is very high. Also, these formulas are not suitable in case of gradual redemption of debentures/ bonds.

ILLUSTRATION 2

A company issued 10,000, 10% debentures of ₹ 100 each at a premium of 10% on 1.4.2023 to be matured on 1.4.2028. The debentures will be redeemed at par on maturity. COMPUTE the cost of debentures assuming 35% as tax rate.

SOLUTION

The cost of debenture (K_d) will be calculated as below:

$$\text{Cost of debenture (K}_d\text{)} = \frac{I(1-t) + \frac{(RV - NP)}{n}}{\frac{(RV + NP)}{2}}$$

I = Interest on debenture = 10% of ₹100 = ₹10

NP = Net Proceeds = 110% of ₹100 = ₹110

RV = Redemption value = ₹100

n = Period of debenture = 5 years

t = Tax rate = 35% or 0.35

$$K_d = \frac{\text{₹}10(1-0.35) + \frac{(\text{₹}100 - \text{₹}110)}{5 \text{ years}}}{\frac{(\text{₹}100 + \text{₹}110)}{2}}$$

$$\text{Or, } K_d = \frac{(\text{₹}10 \times 0.65) - \text{₹}2}{\text{₹}105} = \frac{\text{₹}4.5}{\text{₹}105} = 0.0428 \text{ or } 4.28\%$$

ILLUSTRATION 3

A company issued 10,000, 10% debentures of ₹ 100 each at par on 1.4.2018 to be matured on 1.4.2028 at par. The company wants to know the cost of its existing debt on 1.4.2023 when the market price of the debentures is ₹ 80. COMPUTE the cost of existing debentures assuming 35% tax rate.

SOLUTION

$$\text{Cost of debenture } (K_d) = \frac{I(1-t) + \frac{(RV-NP)}{n}}{\frac{(RV+NP)}{2}}$$

I = Interest on debenture = 10% of ₹100 = ₹10

NP = Current market price = ₹80

RV = Redemption value = ₹100

n = Period of debenture = 5 years

t = Tax rate = 35% or 0.35

$$K_d = \frac{\text{₹}10(1-0.35) + \frac{(\text{₹}100 - \text{₹}80)}{5 \text{ years}}}{\frac{(\text{₹}100 + \text{₹}80)}{2}}$$

$$\text{Or, } K_d = \frac{(\text{₹}10 \times 0.65) + \text{₹}4}{\text{₹}90} = \frac{\text{₹}10.5}{\text{₹}90} = 0.1166 \text{ or } 11.67\%$$

5.3.1 Cost of Debt using Present value method [Yield to maturity (YTM) approach]

The cost of redeemable debt (K_d) is also calculated by discounting the relevant cash flows using Internal rate of return (IRR). (The concept of IRR is discussed in the Chapter 7 - Investment Decisions). Here, YTM is the annual return of an investment from the current date till maturity date. So, YTM is the internal rate of return at which current price of a debt equals to the present value of all cash-flows.

The relevant cash flows are as follows:

Year	Cash flows
0	Net proceeds in case of new issue/ Current market price in case of existing debt (NP or P_0)
1 to n	Interest net of tax [$I(1-t)$]
n	Redemption value (RV)

Steps to calculate relevant cash flows:

Step-1: Identify the cash flows.

Step-2: Calculate NPVs of cash flows as identified above using two discount rates (guessing).

Step-3: Calculate IRR.

Example-2: A company issued 10,000, 10% debentures of ₹ 100 each on 1.4.2023 to be matured on 1.4.2028. The company wants to know the current cost of its existing debt if the market price of the debentures is ₹ 80, assuming 35% tax rate.

Step-1: Identification of relevant cash flows

Year	Cash flows
0	Current market price (P_0) = ₹80
1 to 5	Interest net of tax [$I(1-t)$] = 10% of ₹100 (1-0.35) = ₹6.5
5	Redemption value (RV) = Face value i.e. ₹100

Step- 2: Calculation of NPVs at two discount rates

Year	Cash flows (₹)	Discount factor @ 10% (L)	Present Value (₹)	Discount factor @ 15% (H)	Present Value (₹)
0	80	1.000	(80.00)	1.000	(80.00)
1 to 5	6.5	3.791	24.64	3.352	21.79
5	100	0.621	62.10	0.497	49.70
NPV			+6.74		-8.51

Step- 3: Calculation of IRR

$$\text{IRR} = L + \frac{\text{NPV}_L}{\text{NPV}_L - \text{NPV}_H} (H - L) = 10\% + \frac{₹6.74}{₹6.74 - (₹-8.51)} (15\% - 10\%) = 12.21\%$$

YTM or present value method is a superior method of determining cost of debt of company to approximation method and it is also preferred in the field of finance. We may keep in mind that in the above formula, **higher the difference between H and L, lower the accuracy** of answer.

ILLUSTRATION 4

Institutional Development Bank (IDB) issued Zero interest deep discount bonds of face value of ₹1,00,000 each issued at ₹2,500 & repayable after 25 years. COMPUTE the cost of debt if there is no corporate tax.

SOLUTION

Here,

Redemption Value (RV) = ₹1,00,000

Net Proceeds (NP) = ₹ 2,500

Interest = 0

Life of bond = 25 years

There is huge difference between RV and NP, therefore, in place of approximation method, we should use trial & error method.

$$\text{FV} = \text{PV} \times (1+r)^n$$

$$₹ 1,00,000 = ₹ 2,500 \times (1+r)^{25}$$

$$₹ 40 = (1+r)^{25}$$

$$\text{Trial 1: } r = 15\%, (1.15)^{25} = 32.919$$

$$\text{Trial 2: } r = 16\%, (1.16)^{25} = 40.874$$

Here:

$$L = 15\%, H = 16\%$$

$$NPV_L = ₹ 32.919 - ₹ 40 = ₹ -7.081$$

$$NPV_H = ₹ 40.874 - 40 = + ₹ 0.874$$

$$\begin{aligned} IRR &= L + \frac{NPV_L}{NPV_L - NPV_H} (H - L) \\ &= 15\% + \frac{₹ - 7.081}{₹ - 7.081 - (₹ 0.874)} \times (16\% - 15\%) \\ &= 15.89\% \end{aligned}$$

5.3.2 Amortisation of Bond

A bond may be amortised every year i.e., principal is repaid every year rather than at maturity. In such a situation, the principal will go down with annual payments and interest will be computed on the outstanding amount. The cash flows of the bonds will be uneven.

The formula for determining the value of a bond or debenture that is amortised every year is as follows:

$$V_B = \frac{C_1}{(1+K_d)^1} + \frac{C_2}{(1+K_d)^2} + \dots + \frac{C_n}{(1+K_d)^n}$$

$$V_B = \sum_{t=1}^n \frac{C_t}{(1+K_d)^t}$$

ILLUSTRATION 5

RBML is proposing to sell a 5-year bond of ₹ 5,000 at 8 per cent rate of interest per annum. The bond amount will be amortised equally over its life. CALCULATE the bond's present value for an investor if he expects a minimum rate of return of 6 per cent?

SOLUTION

The amount of interest will go on declining as the outstanding amount of bond will be reducing due to amortisation. The amount of interest for five years will be:

First year: $\text{₹}5,000 \times 0.08 = \text{₹} 400$;

Second year: $(\text{₹}5,000 - \text{₹}1,000) \times 0.08 = \text{₹} 320$;

Third year: $(\text{₹}4,000 - \text{₹}1,000) \times 0.08 = \text{₹} 240$;

Fourth year: $(\text{₹}3,000 - \text{₹}1,000) \times 0.08 = \text{₹} 160$; and

Fifth year: $(\text{₹}2,000 - \text{₹}1,000) \times 0.08 = \text{₹} 80$

The outstanding amount of bond will be zero at the end of fifth year.

Since RBML will have to return ₹1,000 every year, the outflows every year will consist of interest payment and repayment of principal as follows:

First year: $\text{₹}1,000 + \text{₹} 400 = \text{₹}1,400$;

Second year: $\text{₹}1,000 + \text{₹} 320 = \text{₹}1,320$;

Third year: $\text{₹}1,000 + \text{₹} 240 = \text{₹}1,240$;

Fourth year: $\text{₹}1,000 + \text{₹} 160 = \text{₹}1,160$; and

Fifth year: $\text{₹}1,000 + \text{₹}80 = \text{₹} 1,080$

The above cash flows of all five years will be discounted with the cost of capital. Here, cost of capital will be the minimum expected rate of return of investor i.e. 6%.

Value of the bond is calculated as follows:

$$\begin{aligned}
 V_B &= \frac{\text{₹}1,400}{(1.06)^1} + \frac{\text{₹}1,320}{(1.06)^2} + \frac{\text{₹}1,240}{(1.06)^3} + \frac{\text{₹}1,160}{(1.06)^4} + \frac{\text{₹}1,080}{(1.06)^5} \\
 &= \frac{\text{₹}1,400}{1.06} + \frac{\text{₹}1,320}{1.1236} + \frac{\text{₹}1,240}{1.1910} + \frac{\text{₹}1,160}{1.2624} + \frac{\text{₹}1,080}{1.3382} \\
 &= \text{₹}1,320.75 + \text{₹}1,174.80 + \text{₹}1,041.14 + \text{₹}918.88 + \text{₹}807.05 = \text{₹} 5,262.62
 \end{aligned}$$

5.4 Cost of Convertible Debentures

The holders of the convertible debentures has the option to either get the debentures redeemed into the cash or get specified numbers of company's shares

in lieu of cash. The calculation of cost of convertible debentures are very much similar to that of redeemable debentures. While determining the redemption value of the debentures, it is assumed that all the debenture holders will choose the option which has the higher value and accordingly, it will be considered to calculate the cost of debentures.

Example – 3 : A company issued 10,000, 15% Convertible debentures of ₹100 each with a maturity period of 5 years. At maturity, the debenture holders will have an option to convert the debentures into equity shares of the company in the ratio of 1:10 (10 shares for each debenture). The current market price of the equity shares is ₹12 each and historically the growth rate of the shares is 5% per annum. Compute the cost of debentures assuming 35% corporate tax rate.

Determination of Redemption value:

Higher of

- (i) The cash value of debentures = ₹100
- (ii) Value of equity shares = 10 shares × ₹12 (1+0.05)⁵
= 10 shares × 15.312 = ₹153.12

₹153.12 will be taken as redemption value as it is higher than the cash option and is more attractive to the investors.

Calculation of Cost of Convertible debenture (using approximation method):

$$K_d = \frac{I(1-t) + \frac{(RV-NP)}{n}}{\frac{(RV+NP)}{2}} = \frac{15(1-0.35) + \frac{(153.12-100)}{5}}{\frac{(153.12+100)}{2}} = \frac{9.75+10.62}{126.53} = 16.09\%$$

Alternatively:

Calculation of Cost of Convertible debenture (using present value method):

$$\text{*Post Tax Interest per annum} = (100 \times 15\%) \times 0.65 = 9.75$$

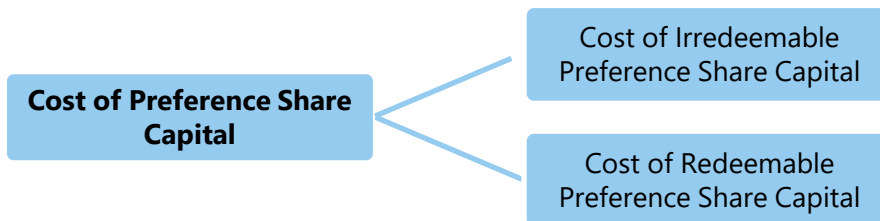
Year	Cash flows (₹)	Discount factor @ 15% (L)	Present Value (₹)	Discount factor @ 20% (H)	Present Value (₹)
0	100	1.000	(100.00)	1.000	(100.00)
1 to 5	9.75*	3.352	32.68	2.991	29.16
5	153.12	0.497	76.10	0.402	61.55
NPV			+8.78		-9.29

$$IRR = L + \frac{NPV_L}{NPV_L - NPV_H} (H - L) = 15\% + \frac{₹8.78}{₹8.78 - (₹-9.29)} (20\% - 15\%) = 0.17429 \text{ or } 17.43\%$$



6. COST OF PREFERENCE SHARE CAPITAL (K_p)

The preference shareholders are paid dividend at a specified rate on face value of preference shares. Payment of dividend to the preference shareholders are not mandatory but are given priority over the equity shareholder. The payment of dividend to the preference shareholders are not charged as expenses but treated as an appropriation of after-tax profit. Hence, dividend paid to preference shareholders does not reduce the tax liability of the company. Like the debentures, preference share capital can also be categorised as redeemable and irredeemable.



6.1 Cost of Irredeemable Preference Shares

The cost of irredeemable preference shares is similar to the calculation of perpetuity. The cost of irredeemable preference share is calculated by dividing the preference dividend with the current market price or net proceeds from the issue. The cost of irredeemable preference share calculation is as below:

$$\text{Cost of Irredeemable Preference Shares (K}_p\text{)} = \frac{\text{PD}}{\text{P}_0}$$

Where,

PD = Annual preference dividend

P₀ = Net proceeds from issue of preference shares

Net proceeds means issue price less issue expenses or floatation cost. If issue price is not given, then students can assume it to be equal to current market price. If issue expenses are not given, then simply assume it to be equal to zero.

ILLUSTRATION 6

XYZ Ltd. issues 2,000 10% preference shares of ₹ 100 each at ₹ 95 each. CALCULATE the cost of preference shares.

SOLUTION

$$K_p = \frac{\text{PD}}{\text{P}_0}$$

$$K_p = \frac{(10 \times 2,000)}{(95 \times 2,000)} = \frac{10}{95} = 0.1053 \text{ or } 10.53\%$$

ILLUSTRATION 7

If R Energy Ltd. is issuing preferred stock at ₹100 per share, with a stated dividend of ₹12, and a floatation cost of 3% then, CALCULATE the cost of preference share?

SOLUTION

Here, Net Proceeds (P₀) will be issue price less floatation cost.

$$P_0 = ₹ 100 - 3\% \text{ of } ₹ 100 = ₹ 97$$

$$K_p = \frac{\text{PD}}{\text{P}_0}$$

$$= \frac{₹ 12}{₹ 97} = 0.1237 \text{ or } 12.37\%$$

6.2 Cost of Redeemable Preference Shares

Preference shares issued by a company which are redeemed on its maturity is called as redeemable preference shares. Cost of redeemable preference share is similar to the cost of redeemable debentures with the exception that the dividends paid to the preference shareholders are not tax deductible. Cost of preference capital is calculated as follows:

$$\text{Cost of Redeemable Preference Shares (K}_p\text{)} = \frac{\text{PD} + \frac{(\text{RV} - \text{NP})}{n}}{\frac{(\text{RV} + \text{NP})}{2}}$$

Where,

- PD = Annual preference dividend
- RV = Redemption value of preference shares
- NP = Net proceeds from issue of preference shares
- n = Remaining life of preference shares

Net proceeds mean issue price less issue expenses or floatation cost. If issue price is not given, then students can assume it to be equal to current market price. If issue expenses are not given, then simply assume it to be equal to zero.

The cost of redeemable preference share may also be calculated as the discount rate that equates the net proceeds of the sale of preference shares with the present value of the future dividends and principal payments.

ILLUSTRATION 8

XYZ Ltd. issues 2,000 10% preference shares of ₹ 100 each at ₹ 95 each. The company proposes to redeem the preference shares at the end of 10th year from the date of issue. CALCULATE the cost of preference share?

SOLUTION

$$K_p = \frac{\text{PD} + \frac{(\text{RV} - \text{NP})}{n}}{\frac{(\text{RV} + \text{NP})}{2}}$$

$$K_p = \frac{10 + \left(\frac{100 - 95}{10} \right)}{\left(\frac{100 + 95}{2} \right)} = 0.1077 \text{ or } 10.77\% \text{ (approx.)}$$



7. COST OF EQUITY SHARE CAPITAL (K_E)

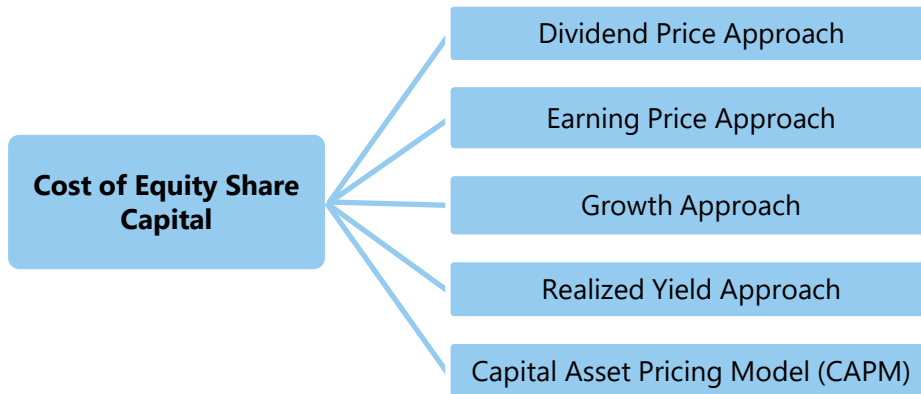
Just like any other source of finance, cost of equity is expectation of equity shareholders. We know that the value is performance divided by expectations. If we know the value and performance, then we can calculate expectation as a balancing figure.

Here, performance means the amount paid by the company to investors, like interest, dividend, redemption price etc. In case of debentures and preference shares, amount of interest or dividend is fixed but in case of equity shares it is uncertain.

Therefore, there is not a single method to calculate cost of equity but different methods which depends on various factors like:

- (1) If dividend is expected to be constant, then **dividend price approach** should be used.
- (2) If earning per share is expected to be constant, then **earning price approach** should be used.
- (3) If dividend and earning are expected to grow at a constant rate, then **growth approach (Gordon's model)** should be used.
- (4) If it is difficult to forecast future dividend or EPS, then **realised yield approach** should be used, which looks into past.
- (5) All the above methods calculate the cost of equity as a balancing figure. When the cost of equity or expectation of investors is dependent on risk i.e., Higher the risk, higher the expectations and vice versa, then **Capital asset pricing model (CAPM)** should be used, which is based on risk.

Different methods employed to compute the cost of equity share capital are:



7.1 Dividend Price Approach

This is also known as **Dividend Valuation Model**. This model makes an assumption that the dividend per share is expected to remain constant forever. Here, cost of equity capital is computed by dividing the expected dividend by market price per share as follows:

$$\text{Cost of Equity } (K_e) = \frac{D}{P_0}$$

Where,

K_e = Cost of equity

D = Expected dividend (also written as D_1)

P_0 = Market price of equity (ex- dividend)

7.2 Earnings Price Approach

The advocates of this approach co-relate the earnings of the company with the market price of its share. Accordingly, the cost of equity share capital would be based upon the expected rate of earnings of a company. The argument is that each investor expects a certain amount of earnings, whether distributed or not from the company in whose shares he invests. Thus, if an investor expects that the company in which he is going to subscribe for shares should have at least a 20% rate of earning, the cost of equity share capital can be construed on this basis.

Suppose the company is expected to earn 30% the investor will be prepared to pay ₹ 150 $\left(\frac{30}{20} \times 100 \right)$ for each share of ₹ 100.

Earnings Price Approach:

$$\text{Cost of Equity (K}_e\text{)} = \frac{E}{P}$$

Where,

E = Current earnings per share

P = Market price per share

This approach assumes that the earnings per share will remain constant forever. The Earning Price Approach is similar to the dividend price approach; only it seeks to nullify the effect of changes in the dividend policy.

7.3 Growth Approach or Gordon's Model

As per this approach, the rate of dividend growth remains constant. Where, earnings, dividends and equity share price all grow at the same rate, the cost of equity capital may be computed as follows:

$$\text{Cost of Equity (K}_e\text{)} = \frac{D_1}{P_0} + g$$

Where,

$D_1 = [D_0 (1 + g)]$ i.e. next expected dividend

P_0 = Current Market price per share

g = Constant Growth Rate of Dividend

In case of newly issued equity shares where floatation cost is incurred, the cost of equity share with an estimation of constant dividend growth is calculated as below:

$$\text{Cost of Equity (K}_e\text{)} = \frac{D_1}{P_0 - F} + g$$

Where, F = Flotation cost per share

Dividend Discount Model with variable growth rate is explained in chapter 8 - Dividend Decisions.

ILLUSTRATION 9

A company has paid dividend of ₹ 1 per share (of face value of ₹ 10 each) last year and it is expected to grow @ 10% every year. CALCULATE the cost of equity if the market price of share is ₹ 55.

SOLUTION

$$K_e = \frac{D_1}{P_0} + g = \frac{₹ 1(1+0.1)}{₹ 55} + 0.1 = 0.12 \text{ or } 12\%$$

Estimation of Growth Rate

The calculation of 'g' (the growth rate) is an important factor in calculating cost of equity share capital. Generally, two methods are used to determine the growth rate, as discussed below:

(i) Average Method

$$\text{Current Dividend (D}_0\text{)} = D_n(1+g)^n$$

or

$$\text{Growth rate} = \sqrt[n]{\frac{D_0}{D_n}} - 1$$

Where,

D_0 = Current dividend,

D_n = Dividend in n years ago

Growth rate can also be found as follows:

Step-I: Divide D_0 by D_n , find out the result, then refer the FVIF table.

Step-II: Find out the result found at Step-I in corresponding year's row.

Step-III: See the interest rate for the corresponding column. This is the growth rate.

Example - 4: The current dividend (D_0) is ₹16.10 and the dividend 5 year ago was ₹10. The growth rate in the dividend can found out as follows:

Step-I: Divide D_0 by D_n i.e. $₹16.10 \div ₹10 = 1.61$

Step-II: Find out the result found at Step-I i.e. 1.61 in corresponding year's row i.e. 5th year.

Step-III: See the interest rate for the corresponding column which is 10%. Therefore, growth rate (g) is 10%.

(ii) Gordon's Growth Model

Unlike the Average method, Gordon's growth model attempts to derive a future growth rate. As per this model, increase in the level of investment will give rise to an increase in future dividends. This model takes Earnings retention rate (b) and rate of return on investments (r) into account to estimate the future growth rate.

It can be calculated as below:

$$\text{Growth (g)} = b \times r$$

Where,

b = earnings retention rate*

r = rate of return on fund invested

*Proportion of earnings available to equity shareholders which is not distributed as dividend.

(This Model is discussed in detail in chapter 8 - Dividend Decisions.)

7.4 Realized Yield Approach

According to this approach, the average rate of return realized in the past few years is historically regarded as 'expected return' in the future. It computes cost of equity based on the past records of dividends actually realised by the equity shareholders. Though, this approach provides a single mechanism of calculating cost of equity, it has unrealistic assumptions like risks faced by the company remain same; the shareholders continue to expect the same rate of return; and the reinvestment opportunity cost (rate) of the shareholders is same as the realised yield. If the earnings do not remain stable, this method is not practical.

ILLUSTRATION 10

Mr. Mehra had purchased a share of Alpha Limited for ₹ 1,000. He received dividend for a period of five years at the rate of 10 per cent. At the end of the fifth year, he sold the share of Alpha Limited for ₹ 1,128. You are required to COMPUTE the cost of equity as per realised yield approach.

SOLUTION

We know that as per the realised yield approach, cost of equity is equal to the realised rate of return. Therefore, it is important to compute the internal rate of return by trial and error method. This realised rate of return is the discount rate which equates the present value of the dividends received in the past five years plus the present value of sale price of ₹ 1,128 to the purchase price of ₹1,000. The discount rate which equalises these two is 12 per cent approximately. Let us look at the table given for a better understanding:

Year	Dividend (₹)	Sale Proceeds (₹)	Discount Factor @ 12%	Present Value (₹)
1	100	-	0.893	89.3
2	100	-	0.797	79.7
3	100	-	0.712	71.2
4	100	-	0.636	63.6
5	100	-	0.567	56.7
5	End	1,128	0.567	639.576
				1,000.076

We find that the purchase price of Alpha Limited's share was ₹ 1,000 and the present value of the past five years of dividends plus the present value of the sale price at the discount rate of 12 per cent is ₹1,000.076. Therefore, the realised rate of return may be taken as 12 per cent. This 12 per cent is the cost of equity.

ILLUSTRATION 11

CALCULATE the cost of equity from the following data using realized yield approach:

Year	1	2	3	4	5
Dividend per share(₹)	1.00	1.00	1.20	1.25	1.15
Price per share (at the beginning) (₹)	9.00	9.75	11.50	11.00	10.60

SOLUTION

In this question, we will first calculate the yield for last 4 years and then will calculate it's geometric mean.

Yield for last 4 years:

$$1+Y_1 = \frac{D_1+P_1}{P_0} = \frac{₹ 1 + ₹ 9.75}{₹ 9} = 1.1944$$

$$1+Y_2 = \frac{D_2+P_2}{P_1} = \frac{₹ 1 + ₹ 11.50}{9.75} = 1.2821$$

$$1+Y_3 = \frac{D_3+P_3}{P_2} = \frac{₹ 1.2 + ₹ 11}{11.5} = 1.0609$$

$$1+Y_4 = \frac{D_4+P_4}{P_3} = \frac{₹ 1.25 + ₹ 10.60}{11} = 1.0772$$

Geometric mean:

$$K_e = [(1+Y_1) \times (1+Y_2) \times \dots \times (1+Y_n)]^{1/n} - 1$$

$$K_e = [1.1944 \times 1.2821 \times 1.0609 \times 1.0772]^{1/4} - 1 = 0.15 = 15\%$$

7.5 Capital Asset Pricing Model (CAPM) Approach

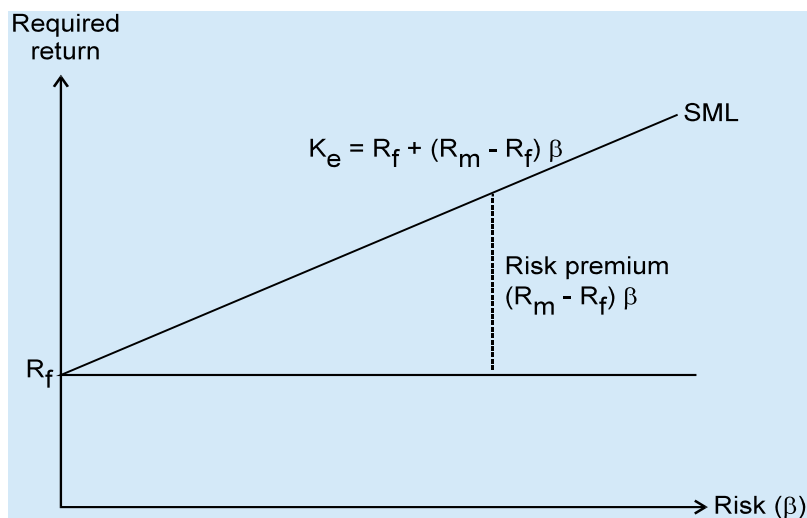
CAPM model describes the risk-return trade-off for securities. It describes the linear relationship between risk and return of securities.

The risk to which a security is exposed, can be classified into two groups:

- (i) **Unsystematic Risk:** This is also called company specific risk as the risk is related with the company's performance. This type of risk can be reduced or eliminated by diversification of the securities portfolio. This is also known as diversifiable risk. The examples are strike or lockdown in company, labour not available, etc.
- (ii) **Systematic Risk:** It is the macro-economic or market specific risk under which a company operates. This type of risk cannot be eliminated by the diversification hence, it is non-diversifiable. The examples are inflation, government policy, interest rate etc.

As diversifiable risk can be eliminated by an investor through diversification, the non-diversifiable risk is the risk which cannot be eliminated; therefore, a business should be concerned as per CAPM method, solely with non-diversifiable risk.

The non-diversifiable risks are assessed in terms of beta coefficient (b or β) through fitting regression equation between return of a security and the return on a market portfolio.



Cost of Equity under CAPM

Thus, the cost of equity capital can be calculated under this approach as:

$$\text{Cost of Equity (K}_e\text{)} = R_f + \beta (R_m - R_f)$$

Where,

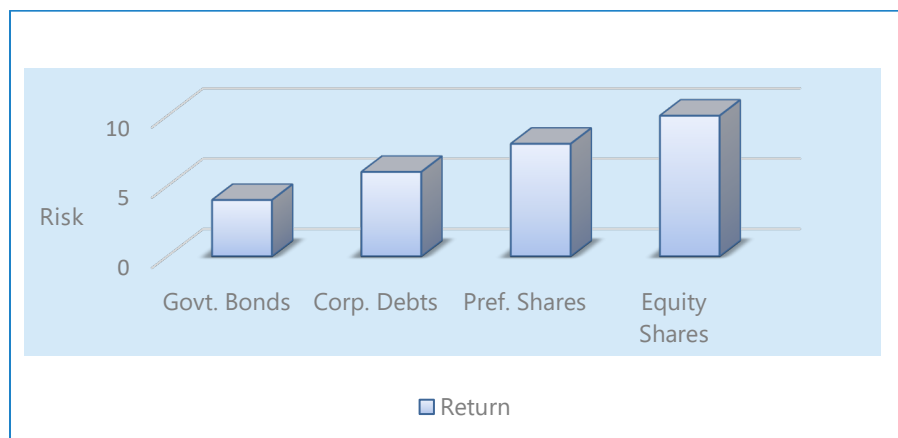
K_e = Cost of equity capital

R_f = Risk free rate of return

β = Beta coefficient

R_m = Rate of return on market portfolio

$(R_m - R_f)$ = Market risk premium



Risk Return relationship of various securities

Therefore, Required rate of return = Risk free rate + Risk premium

- ◆ The idea behind CAPM is that the investors need to be compensated in two ways- (i) Time value of money and (ii) Risk.
- ◆ The time value of money is represented by the risk-free rate in the formula and compensates the investors for placing money in any investment over a period of time.
- ◆ The other half of the formula represents risk and calculates the amount of compensation the investor needs for taking on additional risk. This is calculated by taking a risk measure (beta) which compares the returns of the asset to the market over a period of time and compares it with the market premium.

The CAPM says that the expected return of a security or a portfolio equals the rate on a risk-free security plus risk premium. If this expected return does not meet or beat the required return, then the investment should not be undertaken.

The shortcomings of this approach are:

- (a) Estimation of beta with historical data is unrealistic; and
- (b) Market imperfections may lead investors to unsystematic risk.

Despite these shortcomings, the CAPM is useful in calculating cost of equity, even when the entity is suffering losses.

The basic factor behind determining the cost of equity share capital is to measure the expectation of investors from the equity shares of that particular company. Therefore, the whole question of determining the cost of equity shares hinges upon the factors which go into the expectations of particular group of investors in a company of a particular risk class.

ILLUSTRATION 12

CALCULATE the cost of equity capital of H Ltd., whose risk-free rate of return equals 10%. The firm's beta equals 1.75 and the return on the market portfolio equals to 15%.

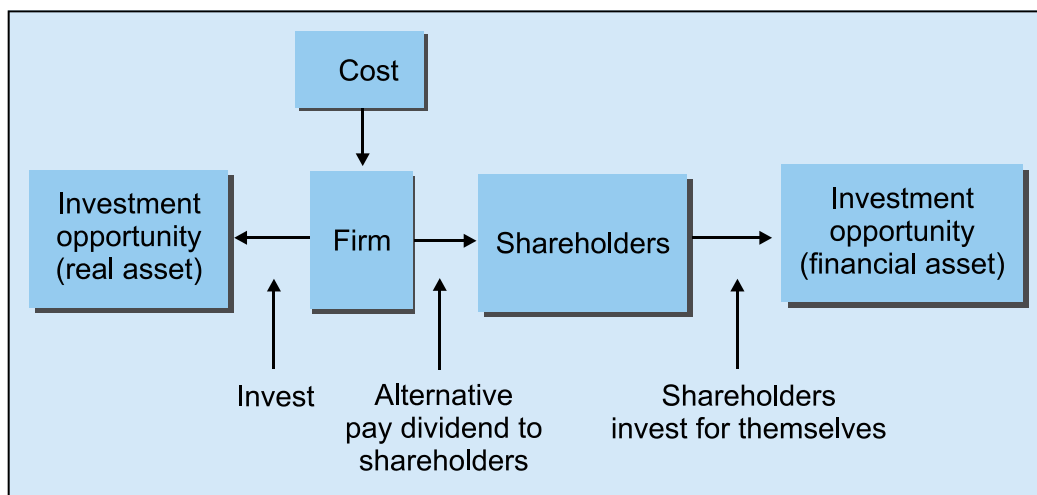
SOLUTION

$$\begin{aligned}
 K_e &= R_f + \beta (R_m - R_f) \\
 K_e &= 0.10 + 1.75 (0.15 - 0.10) \\
 &= 0.10 + 1.75 (0.05) = 0.1875 \text{ or } 18.75\%
 \end{aligned}$$

**8. COST OF RETAINED EARNINGS (K_R)**

Like other sources of fund, retained earnings also involves cost. It is the opportunity cost of dividends foregone by shareholders.

The given below figure depicts how a company can either keep or reinvest cash or return it to the shareholders as dividends. (Arrows represent possible cash flows or transfers.) If the cash is reinvested, the opportunity cost is the expected rate of return that shareholders could have obtained by investing in financial assets.



Cost of Retained Earnings

The cost of retained earnings is often used interchangeably with the cost of equity, as cost of retained earnings is nothing but the expected return of the shareholders from the investment in shares of the company. However, normally cost of equity remains higher than the cost of retained earnings, due to issue of shares at a price lower than current market price and floatation cost.

Formulas used for calculation of cost of retained earnings are same as formulas used for calculation of cost equity:

$$\text{Dividend Price method: } K_r = \frac{D}{P}$$

$$\text{Earning Price method: } K_r = \frac{\text{EPS}}{P}$$

$$\text{Growth method: } K_r = \frac{D_1}{P_0} + g$$

For the calculation of K_e : P = net proceeds realized = issue price less floatation cost. But for calculation of K_r : P = current market price. However, sometimes issue price may also be used. The concept of Floatation cost is not used for the calculation of cost of retained earnings.

ILLUSTRATION 13

Face value of equity shares of a company is ₹10, while current market price is ₹200 per share. Company is going to start a new project, and is planning to finance it partially by new issue and partially by retained earnings. You are

required to CALCULATE cost of equity shares as well as cost of retained earnings if issue price will be ₹190 per share and floatation cost will be ₹5 per share. Dividend at the end of first year is expected to be ₹10 and growth rate will be 5%.

SOLUTION

$$K_r = \frac{D_1}{P_0} + g = \frac{10}{200} + 0.05 = 10\%$$

$$K_e = \frac{D_1}{P_0} + g = \frac{₹ 10}{₹ 190 - ₹ 5} + 0.05 = 10.41\%$$

ILLUSTRATION 14

ABC Company provides the following details:

$$D_0 = ₹ 4.19 \quad P_0 = ₹ 50 \quad g = 5\%$$

CALCULATE the cost of retained earnings.

SOLUTION

$$\begin{aligned} K_r &= \frac{D_1}{P_0} + g = \frac{D_0(1+g)}{P_0} + g \\ &= \frac{₹ 4.19(1+0.05)}{₹ 50} + 0.05 \\ &= 0.088 + 0.05 = 13.8\% \end{aligned}$$

ILLUSTRATION 15

ABC Company provides the following details:

$$R_f = 7\% \quad \beta = 1.20 \quad R_m - R_f = 6\%$$

CALCULATE the cost of retained earnings based on CAPM method.

SOLUTION

$$\begin{aligned} K_r &= R_f + \beta (R_m - R_f) \\ &= 7\% + 1.20 (6\%) = 7\% + 7.20 \\ K_r &= 14.2\% \end{aligned}$$



9. WEIGHTED AVERAGE COST OF CAPITAL (WACC)

To balance financial risk, ownership control over the company and cost of capital, a company usually does not procure entire fund from a single source, rather it makes a mix of various sources of finance. Hence, cost of total capital will be equal to weighted average of cost of individual sources of finance.

WACC is also known as the overall cost of capital which includes the cost of different sources of capital as explained above. WACC of a company depends on the capital structure of a company. It weighs the cost of capital of a particular source of capital with its proportion to the total capital. Thus, weighted average cost of capital is the weighted average after-tax costs of the individual components of firm's capital structure. That is, the after-tax cost of each debt and equity is calculated separately and added together to a single overall cost of capital:

The steps to calculate WACC is as follows:

Step 1: Calculate the total capital from all the sources of capital.

(Long-term debt capital + Pref. Share Capital + Equity Share Capital + Retained Earnings)

Step 2: Calculate the proportion (or %) of each source of capital to the total capital.

$$\left(\frac{\text{Equity Share Capital (for example)}}{\text{Total Capital (as calculated in Step 1 above)}} \right)$$

Step 3: Multiply the proportion as calculated in Step 2 above with the respective cost of capital.

($K_e \times$ Proportion (%) of equity share capital (for example) calculated in Step 2 above)

Step 4: Aggregate the cost of capital as calculated in Step 3 above. This is the WACC.

($K_e + K_d + K_p + K_s$ as calculated in Step 3 above)

Example - 5:**Calculation of WACC**

Source of Capital	Cost of capital	% of total capital	Total
Retained Earnings	10% (K_r)	25% (W_r)	2.50% ($K_r \times W_r$)
Equity Share Capital	11% (K_e)	10% (W_e)	1.10% ($K_e \times W_e$)
Preference Share Capital	9% (K_p)	15% (W_p)	1.35% ($K_p \times W_p$)
Long term debts	6% (K_d)	50% (W_d)	3.00% ($K_d \times W_d$)
Total (WACC)			7.95%

The cost of weighted average method is preferred because the proportions of various sources of funds in the capital structure are different. To be representative, therefore, cost of capital should take into account the relative proportions of different sources of finance.

Securities analysts employ WACC all the time when valuing and selecting investments. In discounted cash flow analysis, WACC is used as the discount rate applied to future cash flows for deriving a business' net present value. WACC can be used as a hurdle rate against which to assess return on investment capital performance. Investors use WACC as a tool to decide whether or not to invest. The WACC represents the minimum rate of return at which a company produces value for its investors. Let's say, if a company produces a return of 20% and has a WACC of 11%, value produced for investor's is 9% approximately. By contrast, the company's return is less than WACC meaning the company is shedding value, which indicates that investors should put their money elsewhere.

Therefore, WACC serves as a useful reality check for investors.

9.1 Choice of Weights

There is a choice of weights between the Book Value (BV) and Market Value(MV).

Book Value (BV): Book value weight is operationally easy and convenient. While using BV, reserves such as share premium and retained profits are included in the BV of equity, in addition to the nominal value of share capital. Here, the value of equity will generally not reflect historic asset values, as well as the future prospects of an organisation.

Market Value (MV): Market value weight is more correct and represent a firm's capital structure. **It is preferable to use MV weights for the equity.** While using MV, reserves such as share premium and retained profits are ignored as they are in effect incorporated into the value of equity. It represents existing conditions and also take into consideration the impacts of changing market conditions and the current prices of various security. Similarly, in case of debt, MV is better to be used rather than the BV of the debt, though the difference may not be very significant.

There is no separate market value for retained earnings. Market value of equity shares represents both paid up equity capital and retained earnings. But cost of equity is not same as cost of retained earnings. Hence to give market value weights, market value of equity shares should be apportioned in the ratio of book value of paid up equity capital and book value of retained earnings.

The following is a comparative analysis of Book Value (BV) and Market Value(MV) choice of weights:

POINT OF COMPARISON	BOOK VALUE (BV)	MARKET VALUE (MV)
1. Definition	Based on the historical cost of assets and liabilities recorded on the balance sheet.	Based on the current market price of equity and debt.
2. Reflects Current Conditions	May not accurately reflect current market conditions or the true economic value.	More accurately reflects the current market conditions and the value investors place on the company.

3. Stability	Generally more stable, as it doesn't fluctuate with market conditions.	Can be volatile and fluctuate with market conditions.
4. Relevance for Investors	Less relevant for investors as it doesn't consider current market perceptions.	More relevant for investors as it reflects the market's view of the company's value.
5. Ease of Calculation	Easier to calculate using financial statements.	Requires market data which can be more complex to gather and calculate.

ILLUSTRATION 16

Cost of equity of a company is 10.41% while cost of retained earnings is 10%. There are 50,000 equity shares of ₹10 each and retained earnings of ₹15,00,000. Market price per equity share is ₹50. Calculate WACC using market value weights if there are no other sources of finance.

SOLUTION

Book value of paid up equity capital = ₹ 5,00,000

Book value of retained earnings = ₹ 15,00,000

Ratio of Paid up equity capital & retained earnings = 5,00,000:15,00,000 = 1:3

Market value of paid up equity capital & retained earnings = ₹ 50,000 x ₹ 50
= ₹ 25,00,000

Market value of paid up equity capital = ₹ 25,00,000 x $\frac{1}{4}$ = ₹ 6,25,000

Market value of retained earnings = ₹ 25,00,000 x $\frac{3}{4}$ = ₹18,75,000

Calculation of WACC using market value weights

Source of capital	Market Value	Weights	Cost of capital	WACC (K_o)
	(₹)	(a)	(b)	(c) = (a) × (b)
Equity shares	6,25,000	0.25	0.1041	0.0260

Retained earnings	18,75,000	0.75	0.1000	0.0750
	25,00,000	1.000		0.1010

WACC (K_o) = 0.1010 or 10.10%

ILLUSTRATION 17

CALCULATE the WACC using the following data by using:

- (a) *Book value weights*
- (b) *Market value weights*

The capital structure of the company is as under:

	(₹)
<i>Debentures (₹ 100 per debenture)</i>	5,00,000
<i>Preference shares (₹ 100 per share)</i>	5,00,000
<i>Equity shares (₹ 10 per share)</i>	10,00,000
	20,00,000

The market prices of these securities are:

- Debentures* ₹ 105 per debenture
- Preference shares* ₹ 110 per preference share
- Equity shares* ₹ 24 per equity share

Additional information:

- (1) ₹ 100 per debenture redeemable at par, 10% coupon rate, 4% floatation costs, 10-year maturity.
- (2) ₹ 100 per preference share redeemable at par, 5% coupon rate, 2% floatation cost and 10-year maturity.
- (3) Equity shares has ₹ 4 floatation cost and market price of ₹ 24 per share.

The next year expected dividend is ₹ 1 with annual growth of 5%. The firm has practice of paying all earnings in the form of dividend.

Corporate tax rate is 30%. Use YTM method to calculate cost of debentures and preference shares.

SOLUTION

(i) Cost of Equity (K_e)

$$= \frac{D_1}{P_0 - F} + g = \frac{₹1}{₹24 - ₹4} + 0.05 = 0.1 \text{ or } 10\%$$

(ii) Cost of Debt (K_d)

Current market price (P_0) – flotation cost

$$= I(1-t) \times PVAF(r, 10) + RV \times PVIF(r, 10)$$

$$₹105 - 4\% \text{ of } ₹105 = ₹10(1-0.3) \times PVAF(r, 10) + ₹100 \times PVIF(r, 10)$$

Calculation of NPV at discount rate of 5% and 7%

Year	Cash flows (₹)	Discount factor @ 5%	Present Value (₹)	Discount factor @ 7%	Present Value (₹)
0	100.8	1.000	(100.8)	1.000	(100.8)
1 to 10	7	7.722	54.05	7.024	49.17
10	100	0.614	61.40	0.508	50.80
NPV			+14.65		-0.83

Calculation of IRR

$$IRR = 5\% + \frac{14.65}{14.65 - (-0.83)}(7\% - 5\%) = 5\% + \frac{14.65}{15.48}(7\% - 5\%) = 6.89\%$$

Cost of Debt (K_d) = 6.89%

(iii) Cost of Preference shares (K_p)

Current market price (P_0) – flotation cost = PD × PVAF ($r, 10$) + RV × PVIF ($r, 10$)

$$₹110 - 2\% \text{ of } ₹110 = ₹5 \times PVAF(r, 10) + ₹100 \times PVIF(r, 10)$$

Calculation of NPV at discount rate of 3% and 5%

Year	Cash flows (₹)	Discount factor @ 3%	Present Value (₹)	Discount factor @ 5%	Present Value (₹)
0	107.8	1.000	(107.8)	1.000	(107.8)
1 to 10	5	8.530	42.65	7.722	38.61
10	100	0.744	74.40	0.614	61.40
NPV			+9.25		-7.79

Calculation of IRR

$$\text{IRR} = 3\% + \frac{9.25}{9.25 - (-7.79)}(5\% - 3\%) = 3\% + \frac{9.25}{17.04}(5\% - 3\%) = 4.08\%$$

Cost of Preference Shares (K_p) = 4.08%

(a) Calculation of WACC using book value weights

Source of capital	Book Value (₹)	Weights (a)	After tax cost of capital (b)	WACC (K_o) (c) = (a) × (b)
10% Debentures	5,00,000	0.25	0.0689	0.01723
5% Preference shares	5,00,000	0.25	0.0408	0.0102
Equity shares	10,00,000	0.50	0.10	0.05000
	20,00,000	1.00		0.07743

WACC (K_o) = 0.07743 or 7.74%

(b) Calculation of WACC using market value weights

Source of capital	Market Value (₹)	Weights (a)	After tax cost of capital (b)	WACC (K_o) (c) = (a) × (b)
10% Debentures (₹105 × 5,000)	5,25,000	0.151	0.0689	0.0104

5% Preference shares (₹110 × 5,000)	5,50,000	0.158	0.0408	0.0064
Equity shares (₹24 × 1,00,000)	24,00,000	0.691	0.10	0.0691
	34,75,000	1.000		0.0859

$$WACC (K_o) = 0.0859 \text{ or } 8.59\%$$



10. MARGINAL COST OF CAPITAL

The marginal cost of capital may be defined as the cost of raising an additional rupee of capital. Since the capital is raised in substantial amount in practice, marginal cost is referred to as the cost incurred in raising new funds (over and above the existing). Marginal cost of capital is derived, when the average cost of capital is **calculated using the marginal weights**.

The marginal weights represent the proportion of funds the firm intends to employ. Thus, the problem of choosing between the book value weights and the **market value weights** does not arise in the case of marginal cost of capital computation.

To calculate the marginal cost of capital, the intended financing proportion should be applied as weights to marginal component of costs. The marginal cost of capital should, therefore, be calculated in the composite sense. When a firm raises funds in a proportional manner and the component's cost remains unchanged, there will be no difference between average cost of capital (of the total funds) and the marginal cost of capital. The component costs may remain constant upto certain level of funds raised and then start increasing with amount of funds raised.

For example, the cost of debt may remain 7% (after tax) till ₹10 lakhs of debt is raised, between ₹10 lakhs and ₹15 lakhs, the cost may be 8% and so on. Similarly, if the firm has to use the external equity when the retained profits are not sufficient, the cost of equity will be higher because of the floatation costs. When the components cost start rising, the average cost of capital will rise and the marginal cost of capital will however, rise at a faster rate.

ILLUSTRATION 18

ABC Ltd. has the following capital structure, which is considered to be optimum as on 31st March, 2023.

	(₹)
14% Debentures	30,000
11% Preference shares	10,000
Equity Shares (10,000 shares)	1,60,000
	2,00,000

The company share has a market price of ₹ 23.60. Next year dividend per share is 50% of year 2022 EPS. Following is the uniform trend of EPS for the preceding 10 years which is expected to continue in future:

Year	EPS (₹)	Year	EPS (₹)
2013	1.00	2018	1.61
2014	1.10	2019	1.77
2015	1.21	2020	1.95
2016	1.33	2021	2.15
2017	1.46	2022	2.36

The company issued new debentures carrying 16% rate of interest and the current market price of debenture is ₹ 96.

Preference shares of ₹ 9.20 (with annual dividend of ₹ 1.1 per share) were also issued. The company is in 50% tax bracket.

(A) CALCULATE after tax:

- (i) Cost of new debt
- (ii) Cost of new preference shares
- (iii) Cost of new equity share (assuming new equity from retained earnings)

(B) CALCULATE marginal cost of capital when no new shares are issued.

- (C) DETERMINE the amount that can be spent for capital investment before new ordinary shares must be sold. Assuming that the retained earnings for next year's investment is 50 percent of 2022.
- (D) COMPUTE marginal cost of capital when the fund exceeds the amount calculated in (C), assuming new equity is issued at ₹ 20 per share.

SOLUTION

- (A)**
- (i) Cost of new debt

$$K_d = \frac{I(1-t)}{P_0}$$

$$= \frac{₹16(1-0.5)}{₹96} = 0.0833$$

- (ii) Cost of new preference shares

$$K_p = \frac{PD}{P_0} = \frac{₹1.1}{₹9.2} = 0.12$$

- (iii) Cost of new equity shares

$$K_e = \frac{D_1}{P_0} + g$$

$$= \frac{₹1.18}{₹23.60} + 0.10 = 0.05 + 0.10 = 0.15$$

Calculation of g when there is a uniform trend (on the basis of EPS)

$$= \frac{\text{EPS (2014)} - \text{EPS (2013)}}{\text{EPS (2013)}}$$

$$= \frac{₹ 1.10 - ₹ 1.00}{₹ 1.00} = 0.10 \text{ or } 10\%$$

Calculation of D_1

$$D_1 = 50\% \text{ of } 2022\text{EPS} = 50\% \text{ of } 2.36 = ₹ 1.18$$

- (B)**
- Calculation of marginal cost of capital

Type of Capital	Proportion	Specific Cost	Product
(1)	(2)	(3)	(2) × (3) = (4)
Debenture	0.15	0.0833	0.0125

Preference Share	0.05	0.1200	0.0060
Equity Share	0.80	0.1500	0.1200
Marginal cost of capital			0.1385

- (C) The company can spend the following amount without increasing marginal cost of capital and without selling the new shares:

Retained earnings = 50% of EPS of 2022 × outstanding equity shares

$$= 0.50 \times ₹2.36 \times 10,000 \text{ shares} = ₹ 11,800$$

The ordinary equity (Retained earnings in this case) is 80% of total capital

So, ₹11,800 = 80% of Total Capital

$$\therefore \text{Capital investment before issuing equity shares} = \frac{₹ 11,800}{0.80} = ₹ 14,750$$

- (D) If the company spends in excess of ₹ 14,750, it will have to issue new equity shares at ₹20 per share.

$$\therefore \text{The cost of new issue of equity shares will be} = \frac{D_1}{P_0} + g = \frac{₹1.18}{₹20} + 0.10 = 0.159$$

The marginal cost of capital will be:

Type of Capital	Proportion	Specific Cost	Product
(1)	(2)	(3)	(2) × (3) = (4)
Debentures	0.15	0.0833	0.0125
Preference Shares	0.05	0.1200	0.0060
Equity Shares (New)	0.80	0.1590	0.1272
			0.1457

SUMMARY

- ◆ **Cost of Capital:** In simple terms, Cost of capital refers to the discount rate that is used in determining the present value of the estimated future cash proceeds of the business/new project and eventually deciding whether the business/new project is worth undertaking or not. It is also the minimum rate of return that a firm must earn on its investment which will maintain the market value of share at its current level. It can also be stated as the opportunity cost of an investment, i.e., the rate of return that a company would otherwise be able to earn at the same risk level as the investment that has been selected.
- ◆ **Measurement of Specific Cost of Capital for each source of Capital:** The first step in the measurement of the cost of the capital of the firm is the calculation of the cost of raising funds from individual sources. From the viewpoint of capital budgeting decisions, the long term sources of funds are relevant as they constitute the major sources of financing the fixed assets. In calculating the cost of capital, therefore the focus is on long-term funds and which are:-
 - Long term debt (including Debentures)
 - Preference Shares
 - Equity Capital
 - Retained Earnings
- ◆ **Weighted Average Cost of Capital:** WACC (weighted average cost of capital) represents the investors' opportunity cost of taking on the risk of putting money into a company. Since every company has a capital structure i.e. what percentage of funds comes from retained earnings, equity shares, preference shares, debt and bonds, so by taking a weighted average, it can be seen how much cost/interest the company has to pay for every rupee it borrows/invest. WACC can be calculated on the basis of Book Value (BV) weights or Market Value (MV) weights.
- ◆ **Marginal cost of capital:** It may be defined as the cost of raising an additional rupee of capital. Since the capital is raised in substantial amount in practice, marginal cost is referred to as the cost incurred in raising new funds. Marginal cost of capital is derived, when the average cost of capital is calculated using the marginal weights. The marginal weights represent the proportion of funds the entity intends to employ.

TEST YOUR KNOWLEDGE

Multiple Choice Questions (MCQs)

1. Which of the following is not an assumption of the capital asset pricing model (CAPM)?
 - (a) The capital market is efficient.
 - (b) Investors lend or borrow at a risk-free rate of return.
 - (c) Investors do not have the same expectations about the risk and return.
 - (d) Investor's decisions are based on a single-time period.
2. Given: risk-free rate of return = 5 %; market return = 10%; cost of equity = 15%; value of beta (β) is:
 - (a) 1.9
 - (b) 1.8
 - (c) 2.0
 - (d) 2.2
3. may be defined as the cost of raising an additional rupee of capital:
 - (a) Marginal cost of capital
 - (b) Weighted Average cost of capital
 - (c) Simple Average cost of capital
 - (d) Liquid cost of capital
4. Which of the following cost of capital requires to adjust taxes?
 - (a) Cost of Equity Share
 - (b) Cost of Preference Shares,
 - (c) Cost of Debentures
 - (d) Cost of Retained Earnings
5. Marginal Cost of capital is the cost of:
 - (a) Additional Revenue

- (b) *Additional Funds*
 - (c) *Additional Interests*
 - (d) *None of the above*
6. *In order to calculate Weighted Average Cost of Capital, weights may be based on:*
- (a) *Market Values*
 - (b) *Target Values*
 - (c) *Book Values*
 - (d) *Anyone of the above*
7. *Firm's Cost of Capital is the average cost of:*
- (a) *All sources of finance*
 - (b) *All Borrowings*
 - (c) *All share capital*
 - (d) *All Bonds & Debentures*
8. *A company has a financial structure where equity is 70% of its total debt plus equity. Its cost of equity is 10% and gross loan interest is 5%. Corporation tax is paid at 30%. What is the company's weighted average cost of capital (WACC)?*
- (a) *7.55%*
 - (b) *7.80%*
 - (c) *8.70%*
 - (d) *8.05%*
9. *The cost of equity capital is all of the following except:*
- (a) *The minimum rate that a firm should earn on the equity-financed part of an investment.*
 - (b) *A return on the equity-financed portion of an investment that, at worst, leaves the market price of the stock unchanged.*
 - (c) *By far, the most difficult component cost to estimate.*
 - (d) *Generally, lower than the before-tax cost of debt.*

10. What is the overall (weighted average) cost of capital when the firm has ₹ 20 crores in long-term debt, ₹ 4 crores in preferred stock, and ₹ 16 crores in equity shares? The before-tax cost for debt, preferred stock, and equity capital are 8%, 9%, and 15%, respectively. Assume a 50% tax rate.
- (a) 7.60%
 - (b) 6.90%
 - (c) 7.30%
 - (d) 8.90%

Theoretical Questions

1. DISCUSS the meaning of weighted average cost of capital. ILLUSTRATE with an example.
2. DISCUSS the dividend price approach and earnings price approach to estimate cost of equity share capital.
3. What is the DIFFERENCE between Book Value and Market Value weights for calculating weighted average cost of capital?
4. DISCUSS Marginal Cost of Capital.
5. EXPLAIN YTM approach of calculating Cost of Debt.
6. DISCUSS the meaning of Amortisation of Bond.

Practical Problems

1. Gamma Limited has 5,00,000, ₹ 1 ordinary shares whose current ex-dividend market price is ₹ 1.50 per share. The company has just paid a dividend of 27 paise per share, and dividends are expected to continue at this level for some time. If the company has no debt capital, COMPUTE the weighted average cost of capital?
2. The following details are provided by the GPS Limited:

	(₹)
Equity Share Capital	65,00,000

12% Preference Share Capital	12,00,000
15% Redeemable Debentures	20,00,000
10% Convertible Debentures	8,00,000

The cost of equity capital for the company is 16.30% and income tax rate for the company is 30%.

You are required to CALCULATE the Weighted Average Cost of Capital (WACC) of the company.

3. ABC Company's equity share is quoted in the market at ₹25 per share currently. The company pays a dividend of ₹ 2 per share and the investor's market expects a growth rate of 6% per year.

You are required to:

- CALCULATE the company's cost of equity capital.
- If the company issues 10% debentures of face value of ₹100 each and realises ₹ 96 per debenture while the debentures are redeemable after 12 years at a premium of 12%, CALCULATE cost of debenture using YTM?

Assume Tax Rate to be 50%.

4. Masco Limited wishes to raise additional finance of ₹ 10 lakhs for meeting its investment plans. It has ₹ 2,10,000 in the form of retained earnings available for investment purposes. Further details are as following:

(1)	Debt / Equity mix	3:7
(2)	Cost of debt:	
	Upto ₹ 1,80,000	10% (before tax)
	Beyond ₹ 1,80,000	16% (before tax)
(3)	Earnings per share	₹ 4
(4)	Dividend pay out	50% of earnings
(5)	Expected growth rate of dividend	10%
(6)	Current market price per share	₹ 44
(7)	Tax rate	50%

You are required to:

- (a) DETERMINE the pattern for raising the additional finance.
 - (b) DETERMINE the post-tax average cost of additional debt.
 - (c) DETERMINE the cost of retained earnings and cost of equity.
 - (d) COMPUTE the overall weighted average after tax cost of additional finance.
5. DETERMINE the cost of capital of Best Luck Limited using the book value (BV) and market value (MV) weights from the following information:

Sources	Book Value (₹)	Market Value (₹)
Equity shares	1,20,00,000	2,00,00,000
Retained earnings	30,00,000	-
Preference shares	36,00,000	33,75,000
Debentures	9,00,000	10,40,000

Additional information:

- I. Equity: Equity shares are quoted at ₹130 per share and a new issue priced at ₹125 per share will be fully subscribed; flotation costs will be ₹ 5 per share.
- II. Dividend: During the previous 5 years, dividends have steadily increased from ₹ 10.60 to ₹ 14.19 per share. Dividend at the end of the current year is expected to be ₹ 15 per share.
- III. Preference shares: 15% Preference shares with face value of ₹ 100 would realise ₹105 per share.
- IV. Debentures: The company proposes to issue 11-year 15% debentures but the yield on debentures of similar maturity and risk class is 16%; flotation cost is 2%.
- V. Tax: Corporate tax rate is 35%. Ignore dividend tax.

Floatation cost would be calculated on face value.

6. Kalyanam Ltd. has an operating profit of ₹ 34,50,000 and has employed Debt which gives total Interest Charge of ₹ 7,50,000. The firm has an existing Cost of Equity and Cost of Debt as 16% and 8% respectively. The firm has a new proposal before it, which requires funds of ₹ 75 Lakhs and is expected to bring an additional profit of ₹ 14,25,000. To finance the proposal, the firm is expecting to issue an additional debt at 8% and will not be issuing any new equity shares in the market. Assume no tax culture.

You are required to CALCULATE the Weighted Average Cost of Capital (WACC) of Kalyanam Ltd.:

- (i) Before the new Proposal
- (ii) After the new Proposal.

7. A company issues:

- 15% convertible debentures of ₹ 100 each at par with a maturity period of 6 years. On maturity, each debenture will be converted into 2 equity shares of the company. The risk-free rate of return is 10%, market risk premium is 18% and beta of the company is 1.25. The company has paid dividend of ₹ 12.76 per share. Five years ago, it paid dividend of ₹ 10 per share. Flotation cost is 5% of issue amount.
- 5% preference shares of ₹ 100 each at premium of 10%. These shares are redeemable after 10 years at par. Flotation cost is 6% of issue amount.

Assuming corporate tax rate is 40%.

- (i) CALCULATE the cost of convertible debentures using the approximation method.
- (ii) Use YTM method to CALCULATE cost of preference shares.

Year	1	2	3	4	5	6	7	8	9	10
$PVIF_{0.03, t}$	0.971	0.943	0.915	0.888	0.863	0.837	0.813	0.789	0.766	0.744
$PVIF_{0.05, t}$	0.952	0.907	0.864	0.823	0.784	0.746	0.711	0.677	0.645	0.614
$PVIFA_{0.03, t}$	0.971	1.913	2.829	3.717	4.580	5.417	6.230	7.020	7.786	8.530
$PVIFA_{0.05, t}$	0.952	1.859	2.723	3.546	4.329	5.076	5.786	6.463	7.108	7.722

Interest rate	1%	2%	3%	4%	5%	6%	7%	8%	9%
$FVIF_{i, 5}$	1.051	1.104	1.159	1.217	1.276	1.338	1.403	1.469	1.539
$FVIF_{i, 6}$	1.062	1.126	1.194	1.265	1.340	1.419	1.501	1.587	1.677
$FVIF_{i, 7}$	1.072	1.149	1.230	1.316	1.407	1.504	1.606	1.714	1.828

Case Scenarios

1. MNP Ltd. is a multinational company having its operations spread mostly in India and neighbouring countries of India. The promoters of the company believed that capital structure of a company must be kept flexible and balanced, where proper mix should always be maintained between debt and equity. Such mix of debt and equity should be reviewed from time to time keeping in mind the changing situation of India and the global scenario.

The capital structure of MNP Ltd. is as under:

9% Debentures ₹ 2,75,000

11% Preference shares ₹ 2,25,000

Equity shares (face value: ₹ 10 per share) ₹ 5,00,000

Total capital of the company ₹ 10,00,000

The following are some of the additional information provided by MNP Ltd. relating to the above mentioned capital structure.

- (i) ₹ 100 per debenture redeemable at par has 2% floatation cost and 10 years of maturity. The market price per debenture is ₹ 105.
- (ii) ₹ 100 per preference share redeemable at par has 3% floatation cost and 10 years of maturity. The market price per preference share is ₹ 106.
- (iii) Equity share has ₹ 4 floatation cost and market price per share of ₹ 24. The next year expected dividend is ₹ 2 per share with an annual growth of 5%. The firm has a practice of paying all earnings in the form of dividends.
- (iv) Corporate Income-tax rate is 35%.

Since the company is a multinational company market value weights are preferred over book value weights when calculating the Weighted Average Cost of Capital (WACC) for several reasons. The company believes that market values

reflect the current market perception of a company's financial health and future prospects. This is more relevant for calculating the cost of capital today, as investors base their decisions on current market conditions. Book values, based on historical accounting principles, may not accurately represent the true economic value of the company's capital components. Market values capture the actual cost that a company would incur if it were to raise new capital in the current market. Book values might not reflect the true cost of debt due to factors like changes in interest rates or creditworthiness. Similarly, book value of equity might not reflect the current investor expectations for future dividends and growth. Market values are readily available through stock prices and market interest rates. Obtaining accurate book values, especially for intangible assets, can be a complex and time-consuming process.

Being a Finance manager of the company, you are required to provide the answer to the following questions to the top management:

- i. Calculate the cost of equity and choose the correct answer from the following?*
 - (a) 14%
 - (b) 15%
 - (c) 16%
 - (d) 17%
- ii. Calculate the cost of debt and choose the correct answer from the following?*
 - (a) 6.11%
 - (b) 5.11%
 - (c) 5.48%
 - (d) 10.55%
- iii. Calculate the cost of preference shares and choose the correct answer from the following?*
 - (a) 10.57 %
 - (b) 5.11%
 - (c) 9%
 - (d) 10.55%

- iv. Calculate the WACC using market value weights and choose the correct answer from the following?
- (a) 12.80 %
 - (b) 5.11%
 - (c) 9%
 - (d) 10.55%
- v. What will be the current market price of MNP Ltd.'s equity shares if $K_e = 10\%$, expected dividend is ₹2 per share and annual growth rate is 5% from the following options:
- (a) ₹40 per share
 - (b) ₹20 per share
 - (c) ₹30 per share
 - (d) ₹45 per share

ANSWERS/SOLUTION

Answers to the MCQs

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

Answers to the Theoretical Questions

1. Please refer paragraph 9
2. Please refer paragraph 7.1 & 7.2
3. Please refer paragraph 9.1
4. Please refer paragraph 10
5. Please refer paragraph 5.3.1
6. Please refer paragraph 5.3.2

Answers to the Practical Problems

1. Market value of equity, $E = 5,00,000 \text{ shares} \times ₹1.50 = ₹7,50,000$

Market value of debt, $D = \text{Nil}$

$$\text{Cost of equity capital, } K_e = \frac{D_1}{P_0} = \frac{₹0.27}{₹1.50} = 0.18$$

Since there is no debt capital, $WACC = K_e = 18 \text{ per cent.}$

2. **Calculation of Weighted Average Cost of Capital (WACC)**

Source	(₹)	Weight	Cost of Capital after tax	WACC
Equity Capital	65,00,000	0.619	0.163	0.1009
12% Preference Capital	12,00,000	0.114	0.120	0.0137
15% Redeemable Debentures	20,00,000	0.190	0.105*	0.020
10% Convertible Debentures	8,00,000	0.076	0.070**	0.0053
Total	1,05,00,000	1.0000		0.1399

$$\begin{aligned} * \text{ Cost of 15\% Redeemable Debentures (after tax)} &= 15 (1 - 0.30) \\ &= 10.5\% \text{ or } 0.105 \end{aligned}$$

$$** \text{ Cost of 10\% Convertible Debentures (after tax)} = 10 (1 - 0.30) = 7\% \text{ or } 0.070$$

$$\text{Weighted Average Cost of Capital (WACC)} = 0.1399 = 13.99\%$$

(Note: In the above solution, the Cost of Debentures has been computed without considering the impact of special features i.e. redeemability and convertibility in absence of requisite information.)

3. (i) **Cost of Equity Capital (K_e):**

$$K_e = \frac{\text{Expected dividend pershare}(D_1)}{\text{Market price pershare}(P_0)} + \text{Growth rate}(g)$$

$$= \frac{₹ 2 \times 1.06}{₹ 25} + 0.06 = 0.1448 \text{ or } 14.48\%$$

(ii) Cost of Debenture (K_d):

Using Present Value method (YTM)

Identification of relevant cash flows

Year	Cash flows
0	Current market price (P_0) = ₹ 96
1 to 12	Interest net of tax [$I(1-t)$] = 10% of ₹ 100 ($1 - 0.5$) = ₹ 5
12	Redemption value (RV) = ₹ 100 (1.12) = ₹ 112

Calculation of Net Present Values (NPV) at two discount rates

Year	Cash flows(₹)	Discount factor @ 5%(L)	Present Value(₹)	Discount factor @ 10% (H)	Present Value(₹)
0	(96)	1.000	(96.00)	1.000	(96.00)
1 to 12	5	8.863	44.32	6.814	34.07
12	112	0.557	62.38	0.319	35.73
NPV			+10.7		-26.2

Calculation of IRR

$$IRR = L + \frac{NPV_L}{NPV_L - NPV_H} (H - L)$$

$$= 5\% + \frac{₹10.7}{₹10.7 - (₹-26.2)} (10\% - 5\%) = 5\% + \frac{₹53.5}{₹36.9} = 6.45\%$$

Therefore, $K_d = 6.45\%$

4. (a) Pattern for raising the additional finance:

Equity	70% of ₹ 10,00,000	= ₹ 7,00,000
Debt	30% of ₹ 10,00,000	= ₹ 3,00,000

The capital structure after raising additional finance:

	(₹)
Shareholders' funds	
Equity Capital (₹7,00,000–₹2,10,000)	4,90,000
Retained earnings	2,10,000
Debt (Interest at 10% p.a.)	1,80,000
(Interest at 16% p.a.) (₹3,00,000–₹1,80,000)	1,20,000
Total Funds	10,00,000

- (b) Determination of post-tax average cost of additional debt:

$$K_d = I (1 - t)$$

Where,

I = Interest Rate

t = Corporate tax-rate

On ₹ 1,80,000 = 10% (1 – 0.5) = 5% or 0.05

On ₹ 1,20,000 = 16% (1 – 0.5) = 8% or 0.08

Average Cost of Debt

$$= \frac{(\text{₹ } 1,80,000 \times 0.05) + (\text{₹ } 1,20,000 \times 0.08)}{\text{₹ } 3,00,000} \times 100 = 6.2\%$$

- (c) Determination of cost of retained earnings and cost of equity by applying Dividend growth model:

$$K_e \text{ or } K_r = \frac{D_1}{P_0} + g = \frac{D_0(1+g)}{P_0} + g$$

Where,

D_0 = Dividend paid = 50% of EPS = 50% × ₹ 4 = ₹ 2

g = Growth rate = 10%

P_0 = Current market price per share = ₹44

$$\text{So, } K_e \text{ or } K_r = \frac{\text{₹ } 2(1+0.10)}{\text{₹ } 44} + 0.10 = \frac{\text{₹ } 2.2}{\text{₹ } 44} + 0.10 = 0.05 + 0.10 = 0.15 \text{ or } 15\%$$

- (d) Computation of overall weighted average after tax cost of additional finance:

Particulars	Amount (₹)	Weights	Cost of funds	Weighted Cost (%)
Equity (including retained earnings)	7,00,000	0.70	15%	10.5
Debt	3,00,000	0.30	6.2%	1.86
WACC	10,00,000			12.36

5. (i) Cost of Equity (K_e) = $\frac{D_1}{P_0 - F} + g = \frac{\text{₹ } 15}{\text{₹ } 125 - \text{₹ } 5} + 0.06^*$

$$K_e = 0.125 + 0.06 = 0.185$$

*Calculation of g :

$$\text{₹ } 10.6(1+g)^5 = \text{₹ } 14.19$$

$$\text{Or, } (1+g)^5 = \frac{14.19}{10.6} = 1.338$$

Table (FVIF) suggests that ₹1 compounds to ₹1.338 in 5 years at the compound rate of 6 percent. Therefore, g is 6 per cent.

(ii) Cost of Retained Earnings (K_r) = $\frac{D_1}{P_0} + g = \frac{\text{₹ } 15}{\text{₹ } 125} + 0.06 = 0.18$

(iii) Cost of Preference Shares (K_p) = $\frac{PD}{P_0} = \frac{\text{₹ } 15}{\text{₹ } 105} = 0.1429$

(iv) Cost of Debentures (K_d) =
$$\frac{I(1-t) + \left(\frac{RV - NP}{n} \right)}{\frac{RV + NP}{2}}$$

$$= \frac{\text{₹ } 15(1-0.35) + \left(\frac{\text{₹ } 100 - \text{₹ } 91.75^*}{11 \text{ years}} \right)}{\frac{\text{₹ } 100 + \text{₹ } 91.75^*}{2}}$$

$$= \frac{₹ 15 \times 0.65 + ₹ 0.75}{₹ 95.875} = \frac{₹ 10.5}{₹ 95.875} = 0.1095$$

*Since yield on similar type of debentures is 16 per cent, the company would be required to offer debentures at discount.

Market price of debentures (approximation method)

$$= ₹ 15 \div 0.16 = ₹ 93.75$$

$$\text{Sale proceeds from debentures} = ₹ 93.75 - ₹ 2 \text{ (i.e., floatation cost)} = ₹ 91.75$$

Market value (P_0) of debentures can also be found out using the present value method:

$$P_0 = \text{Annual Interest} \times \text{PVIFA (16\%, 11 years)} + \text{Redemption value} \times \text{PVIF (16\%, 11 years)}$$

$$P_0 = ₹ 15 \times 5.029 + ₹ 100 \times 0.195$$

$$P_0 = ₹ 75.435 + ₹ 19.5 = ₹ 94.935$$

$$\text{Net Proceeds} = ₹ 94.935 - 2\% \text{ of } ₹ 100 = ₹ 92.935$$

Accordingly, the cost of debt can be calculated

Total Cost of capital [BV weights and MV weights]

(Amount in (₹) lakh)

Source of capital	Weights		Specific Cost (K)	Total cost	
	BV	MV		(BV × K)	(MV × K)
Equity Shares	120	160*	0.1850	22.2	29.6
Retained Earnings	30	40*	0.1800	5.4	7.2
Preference Shares	36	33.75	0.1429	5.14	4.82
Debentures	9	10.4	0.1095	0.986	1.139
Total	195	244.15		33.73	42.76

*Market Value of equity has been apportioned in the ratio of Book Value of equity and retained earnings i.e., 120:30 or 4:1.

Weighted Average Cost of Capital (WACC):

$$\text{Using Book Value} = \frac{\text{₹ } 33.73}{\text{₹ } 195} = 0.1729 \text{ or } 17.29\%$$

$$\text{Using Market Value} = \frac{\text{₹ } 42.76}{\text{₹ } 244.15} = 0.1751 \text{ or } 17.51\%$$

6. Workings:

$$\begin{aligned} \text{(a) Value of Debt} &= \frac{\text{Interest}}{\text{Cost of debt } (K_d)} \\ &= \frac{\text{₹ } 7,50,000}{0.08} = \text{₹ } 93,75,000 \end{aligned}$$

$$\begin{aligned} \text{(b) Value of equity capital} &= \frac{\text{Operating profit} - \text{Interest}}{\text{Cost of equity } (K_e)} \\ &= \frac{\text{₹ } 34,50,000 - \text{₹ } 7,50,000}{0.16} = \text{₹ } 1,68,75,000 \end{aligned}$$

$$\begin{aligned} \text{(c) New Cost of equity } (K_e) \text{ after proposal} &= \frac{\text{Increased Operating profit} - \text{Interest on Increased debt}}{\text{Equity capital}} \\ &= \frac{(\text{₹ } 34,50,000 + \text{₹ } 14,25,000) - (\text{₹ } 7,50,000 + \text{₹ } 6,00,000)}{\text{₹ } 1,68,75,000} \\ &= \frac{\text{₹ } 48,75,000 - \text{₹ } 13,50,000}{\text{₹ } 1,68,75,000} \\ &= \frac{\text{₹ } 35,25,000}{\text{₹ } 1,68,75,000} = 0.209 \text{ or } 20.9\% \end{aligned}$$

(i) Calculation of Weighted Average Cost of Capital (WACC) before the new proposal

Sources	(₹)	Weight	Cost of Capital	WACC
Equity	1,68,75,000	0.6429	0.160	0.1029
Debt	93,75,000	0.3571	0.080	0.0286
Total	2,62,50,000	1		0.1315 or 13.15 %

(ii) **Calculation of Weighted Average Cost of Capital (WACC) after the new proposal**

Sources	(₹)	Weight	Cost of Capital	WACC
Equity	1,68,75,000	0.5000	0.209	0.1045
Debt	1,68,75,000	0.5000	0.080	0.0400
Total	3,37,50,000	1		0.1445 or 14.45 %

7. (i) **Calculation of Cost of Convertible Debentures:**

Given that,

$$R_F = 10\%$$

$$R_m - R_f = 18\%$$

$$B = 1.25$$

$$D_0 = 12.76$$

$$D_5 = ₹ 10$$

$$\text{Flotation Cost} = 5\%$$

Using CAPM,

$$\begin{aligned} K_e &= R_f + \beta (R_m - R_f) \\ &= 10\% + 1.25 (18\%) \\ &= \mathbf{32.50\%} \end{aligned}$$

Calculation of growth rate in dividend

$$12.76 = 10 (1+g)^5$$

$$1.276 = (1+g)^5$$

$$(1+5\%)^5 = 1.276 \dots\dots\dots \text{from FV Table}$$

$$g = \mathbf{5\%}$$

$$\text{Price of share after 6 years} = \frac{D_7}{k_e - g} = \frac{12.76(1.05)^7}{0.325 - 0.05}$$

$$P_6 = \frac{12.76 \times 1.407}{0.275}$$

$$P_6 = 65.28$$

$$\text{Redemption Value of Debenture (RV)} = 65.28 \times 2 = \mathbf{130.56 \text{ (RV)}}$$

$$\text{NP} = 95$$

$$n = 6$$

$$K_d = \frac{\text{INT}(1-t) + \left(\frac{\text{RV} - \text{NP}}{n} \right)}{\frac{(\text{RV} - \text{NP})}{2}} \times 100$$

$$= \frac{15(1-0.4) + \frac{(130.56 - 95)}{6}}{\frac{(130.56 + 95)}{2}} \times 100$$

$$= \frac{9 + 5.93}{112.78} \times 100$$

$$K_d = \mathbf{13.24\%}$$

(ii) Calculation of Cost of Preference Shares:

$$\text{Net Proceeds} = 100 (1.1) - 6\% \text{ of } 100 (1.1)$$

$$= 110 - 6.60$$

$$= \mathbf{103.40}$$

$$\text{Redemption Value} = 100$$

Year	Cash Flows (₹)	PVF @ 3%	PV (₹)	PVF @ 5%	PV (₹)
0	103.40	1	103.40	1	103.40
1-10	-5	8.530	-42.65	7.722	-38.61
10	-100	0.744	-74.40	0.614	-61.40
			-13.65		3.39

$$K_p = 3\% + \frac{5\% - 3\%}{[(-13.65) - 3.39]} \times -13.65 = 3\% + \frac{2\%}{17.04} \times 13.65$$

$$K_p = \mathbf{4.6021\%}$$

Answers to the Case Scenarios

1.

i.	(b)	ii.	(c)	iii.	(a)	iv.	(a)	v.	(a)
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Working Notes:

$$K_e = \frac{D_1}{P_0} + g$$

$$= 2/20 + 0.05 = 15\%$$

$$K_p = \frac{PD + \frac{(RV - NP)}{n}}{\frac{(RV + NP)}{2}} = \frac{11 + \left(\frac{100 - 102.82}{10} \right)}{\left(\frac{100 + 102.82}{2} \right)} = 10.57\%$$

$$K_d = \frac{I(1-t) + \frac{(RV - NP)}{n}}{\frac{(RV + NP)}{2}} = \frac{9(1-0.35) + \frac{(100 - 102.90)}{10}}{\left(\frac{100 + 102.90}{2} \right)} = 5.48\%$$

Calculation of WACC using market value weights

Source of capital	Market Value	Weights	After tax cost of capital	WACC (K _o)
	(₹)	(a)	(b)	(c) = (a) × (b)
Debentures (₹ 105 per debenture)	2,88,750	0.1672	0.0548	0.0092
Preference shares (₹ 106 per preference share)	2,38,500	0.1381	0.1057	0.0146
Equity shares (₹ 24)	12,00,000	0.6947	0.1500	0.1042
	17,27,250	1.00		0.128

$$WACC (K_o) = 12.8\%$$

$$\text{Current Market Price} = \frac{D_1}{K_e - g} = \frac{2}{0.10 - 0.05} = ₹ 40 \text{ per share}$$

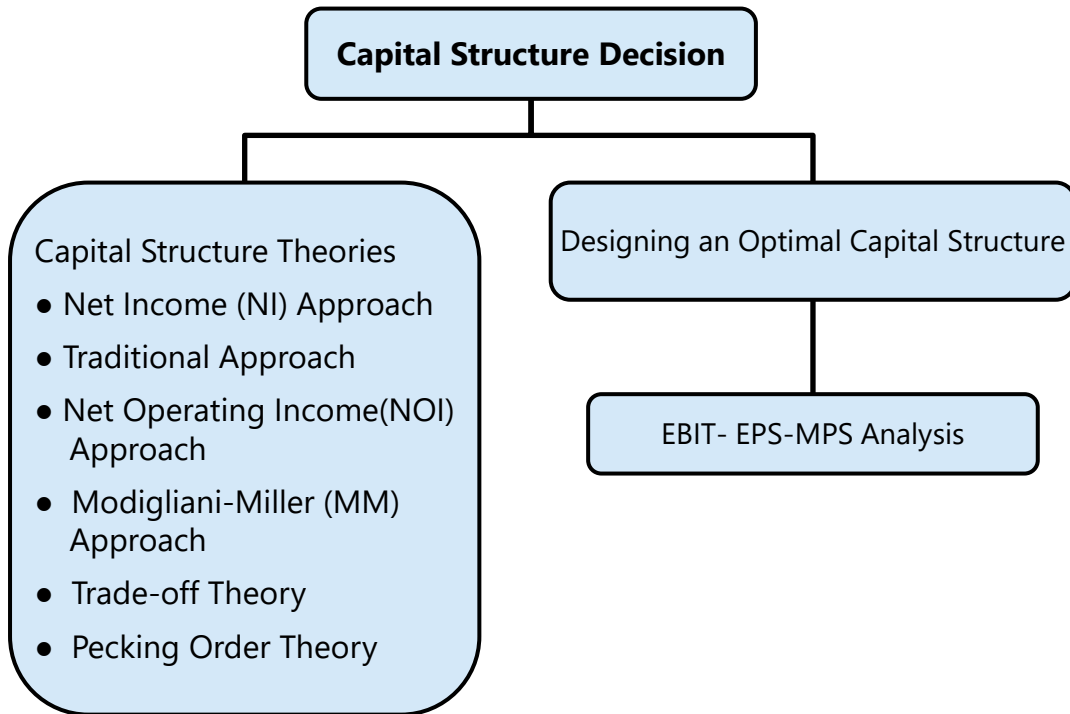
FINANCING DECISIONS- CAPITAL STRUCTURE



LEARNING OUTCOMES

After studying this chapter, you would be able to -

- ◆ State the meaning and significance of Capital Structure.
- ◆ Discuss the various capital structure theories i.e., Net Income (NI) Approach, Traditional Approach, Net Operating Income (NOI) Approach, Modigliani and Miller (MM) Approach, Trade- off Theory and Pecking Order Theory.
- ◆ Describe concepts and factors for designing an optimal capital structure.
- ◆ Discuss essential features of capital structure of an entity.
- ◆ Discuss optimal capital structure.
- ◆ Analyse the relationship between the performance of a company and its impact on the earnings of the shareholders i.e., EBIT-EPS-MPS analysis.
- ◆ Discuss the meaning, causes and consequences of over and under capitalisation to an entity.

CHAPTER OVERVIEW**1. MEANING OF CAPITAL STRUCTURE**

Capital structure is the combination of capitals from different sources of finance. The capital of a company consists of equity share holders' fund, preference share capital and long term external debts. The source and quantum of capital is decided keeping in mind the following factors:

- i. **Control:** Capital structure should be designed in such a manner that existing shareholders continue to hold majority stake.
- ii. **Risk:** Capital structure should be designed in such a manner that financial risk of a company does not increase beyond tolerable limit.
- iii. **Cost:** Overall cost of capital remains minimum.

Practically, it is difficult to achieve all of the above three goals together, hence, a finance manager has to make a balance among these three objectives.

However, the objective of a company is to maximise the value of the company and it is prime objective while deciding the optimal capital structure. Capital Structure decision refers to deciding the forms of financing (which sources to be tapped); their actual requirements (amount to be funded) and their relative proportions (mix) in total capitalisation.

$$\text{Value of the firm} = \frac{\text{EBIT}}{\text{Overall cost of capital / Weighted average cost of capital}}$$

$$K_o = (\text{Cost of debt} \times \text{weight of debt}) + (\text{Cost of equity} \times \text{weight of equity})$$

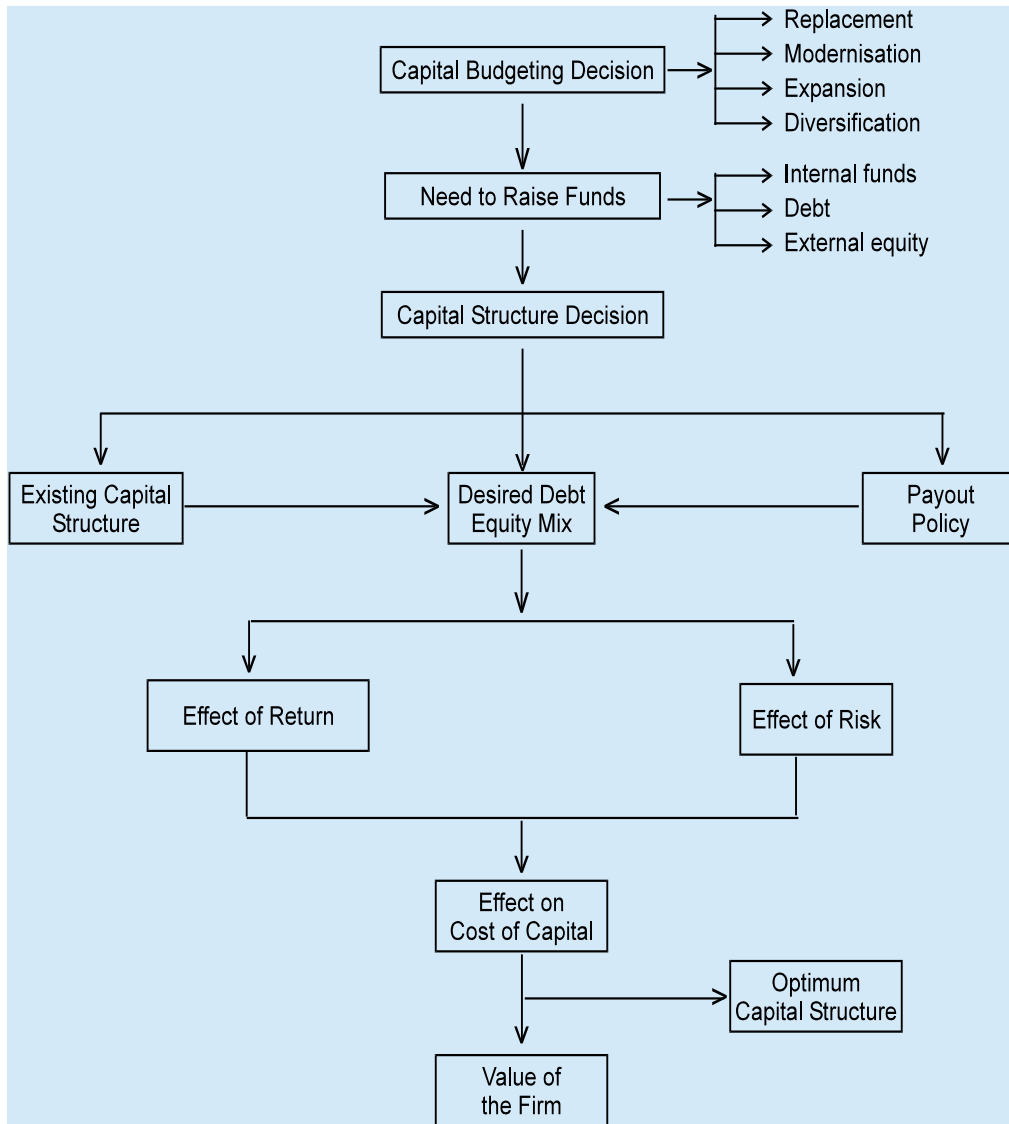
$$K_o = \{[K_d \times D / (D+S)] + [K_e \times S / (D+S)]\}$$

Where:

- ◆ K_o is the weighted average cost of capital (WACC)
- ◆ K_d is the cost of debt
- ◆ D is the market value of debt
- ◆ S is the market value of equity
- ◆ K_e is the cost of equity

Capital structure decision will decide weight of debt and equity and ultimately overall cost of capital as well as Value of the firm. So capital structure is relevant in maximizing value of the firm and minimizing overall cost of capital.

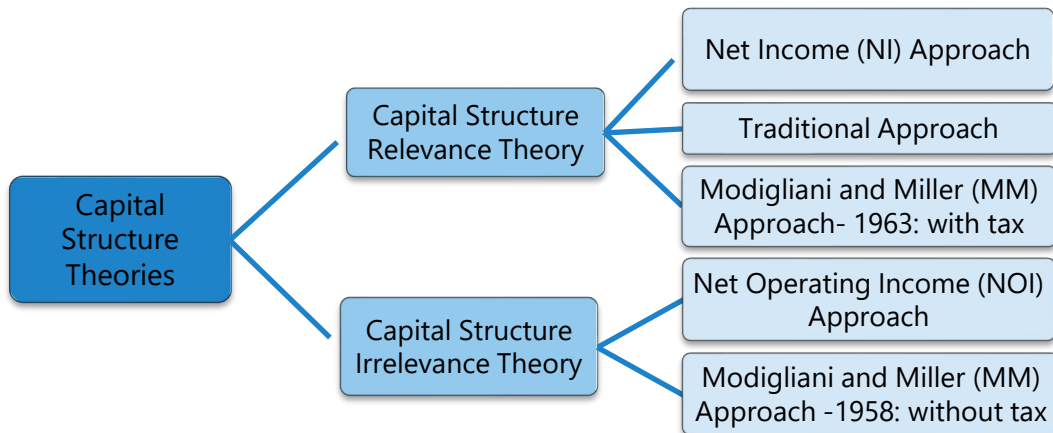
Whenever funds are to be raised to finance investments, capital structure decision is involved. A demand for raising funds generates a new capital structure since a decision has to be made as to the quantity and forms of financing. The process of financing or capital structure decision is depicted in the figure below.

**Financing Decision Process**



2. CAPITAL STRUCTURE THEORIES

The following approaches explain the relationship between cost of capital, capital structure and value of the firm:



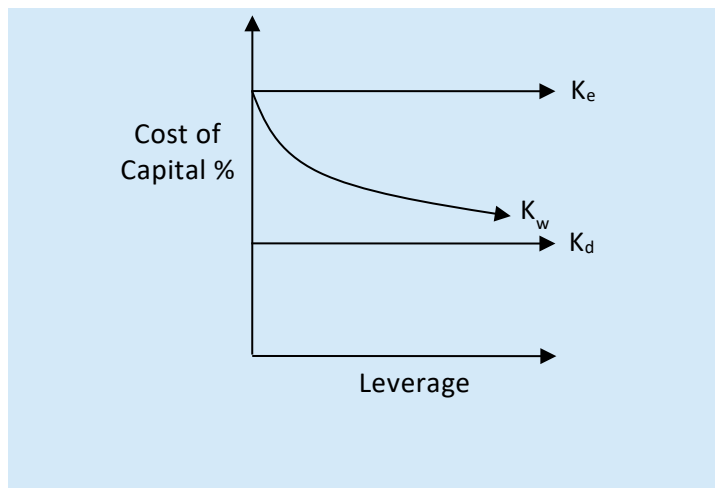
- (a) Net Income (NI) approach
- (b) Traditional approach.
- (c) Net Operating Income (NOI) approach
- (d) Modigliani-Miller (MM) approach

However, the following assumptions are made to understand this relationship:

- ◆ There are only two kinds of funds used by a firm i.e. debt and equity.
- ◆ The total assets of the firm are given. The degree of leverage can be changed by selling debt to purchase shares or selling shares to retire debt.
- ◆ Taxes are not considered.
- ◆ The dividend payout ratio is 100%.
- ◆ The firm's total financing remains constant.
- ◆ Business risk is constant over time.
- ◆ The firm has perpetual life.

2.1 Net Income (NI) Approach

According to this approach, capital structure decision is relevant to the value of the firm. An increase in financial leverage will lead to decline in the weighted average cost of capital (WACC), while the value of the firm as well as market price of ordinary share will increase. Conversely, a decrease in the leverage will cause an increase in the overall cost of capital and a consequent decline in the value as well as market price of equity shares.



Where, K_e is Cost of Equity, K_w is Weighted Average Cost of Capital and K_d is Cost of Debt.

From the above diagram, K_e and K_d are assumed not to change with leverage. As debt increases, it causes weighted average cost of capital (WACC) to decrease.

The value of the firm on the basis of Net Income (NI) Approach can be ascertained as follows:

$$\text{Value of Firm (V)} = S + D$$

Where,

V = Value of the firm

S = Market value of equity

D = Market value of debt

$$\text{Market value of equity (S)} = \frac{\text{NI}}{K_e}$$

Where,

NI = Earnings available for equity shareholders

K_e = Equity Capitalisation rate

Under NI approach, the value of the firm will be maximum at a point where weighted average cost of capital (WACC) is minimum. Thus, the theory suggests total or maximum possible debt financing for minimising the cost of capital. The overall cost of capital under this approach is:

$$\text{Overall cost of capital} = \frac{\text{EBIT}}{\text{Value of the firm}}$$

Thus, according to this approach, the firm can increase its total value by decreasing its overall cost of capital through increasing the degree of leverage. The significant conclusion of this approach is that it pleads for the firm to employ as much debt as possible to maximise its value.

ILLUSTRATION 1

Rupa Ltd.'s EBIT is ₹ 5,00,000. The company has 10%, ₹ 20 lakh debentures. The equity capitalization rate (K_e) is 16%.

You are required to CALCULATE:

- (i) *Market value of equity and value of firm*
- (ii) *Overall cost of capital*

SOLUTION

(i) Statement showing Market value of equity and value of firm

	₹
EBIT	5,00,000
Less: Interest on debentures (10% of ₹ 20,00,000)	(2,00,000)
Earnings available for equity holders i.e. Net Income (NI)	3,00,000

Equity capitalization rate (K_e)	16%
Market value of equity (S) = $\frac{NI}{K_e} = \left(\frac{3,00,000}{16} \times 100 \right)$	18,75,000
Market value of debt (D)	20,00,000
Total value of firm $V = S + D$	38,75,000

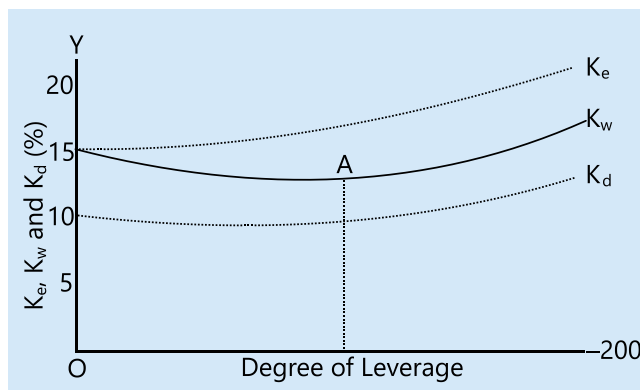
(ii) Overall cost of capital = $\frac{\text{EBIT}}{\text{Value of firm}} = \frac{\text{₹ } 5,00,000}{\text{₹ } 38,75,000} = 12.90\%$

2.2 Traditional Approach

This approach favours that as a result of financial leverage up to some point, cost of capital comes down and value of firm increases. However, beyond that point, reverse trends emerges. The principle implication of this approach is that the cost of capital is dependent on the capital structure and there is an optimal capital structure which minimises cost of capital.

Under this approach:

- The rate of interest on debt remains constant for a certain period and thereafter with an increase in leverage, it increases.
- The expected rate by equity shareholders remains constant or increase gradually. After that, the equity shareholders starts perceiving a financial risk and then from the optimal point, the expected rate increases speedily.
- As a result of the activity of rate of interest and expected rate of return, the WACC first decreases and then increases. The lowest point on the curve is optimal capital structure.



Optimum capital structure occurs at the point where value of the firm is highest and the cost of capital is the lowest.

According to net operating income approach, capital structure decisions are totally irrelevant. Modigliani-Miller supports the net operating income approach but provides behavioural justification. The traditional approach strikes a balance between these extremes.

Main Highlight of Traditional Approach

The firm should strive to reach the optimal capital structure and its total valuation through a judicious use of both the debt and equity in capital structure. At the optimal capital structure, the overall cost of capital will be minimum and the value of the firm will be maximum.

ILLUSTRATION 2

Indra Ltd. has an EBIT of ₹ 1,00,000. The company makes use of both the debt and equity capital. The firm has 10% debentures of ₹ 5,00,000 and the firm's equity capitalization rate is 15%.

You are required to COMPUTE:

- (i) Total value of the firm
- (ii) Overall cost of capital.

SOLUTION

(i) Calculation of total value of the firm

	₹
EBIT	1,00,000
Less: Interest (@10% on ₹ 5,00,000)	50,000
Earnings available for equity holders	50,000
Equity capitalization rate i.e. K_e	15%

$$\begin{aligned}
 \text{Value of equity (S)} &= \frac{\text{Earnings available for equity holders}}{K_e} \\
 &= \frac{₹50,000}{0.15} = ₹ 3,33,333
 \end{aligned}$$

Value of Debt (D) (given) ₹ 5,00,000

Total value of the firm (V) = D + S (5,00,000 + 3,33,333) ₹ 8,33,333

$$(ii) \text{ Overall cost of capital } (K_o) = K_e \left(\frac{S}{V} \right) + K_d \left(\frac{D}{V} \right)$$

$$= 0.15 \left(\frac{₹3,33,333}{₹8,33,333} \right) + 0.10 \left(\frac{₹5,00,000}{₹8,33,333} \right)$$

$$= \frac{1}{₹8,33,333} [₹50,000 + ₹50,000] = 12.00\%$$

$$\text{Or, } K_o = \frac{\text{EBIT}}{V} = \frac{₹1,00,000}{₹8,33,333} = 12.00\%$$

ILLUSTRATION 3

DETERMINE the optimal capital structure of a company from the following information:

Options	Cost of Debt (K_d) in %	Cost of Equity (K_e) in %	Percentage of Debt on total value (Debt + Equity)
1	11.0	13.0	0.0
2	11.0	13.0	0.1
3	11.6	14.0	0.2
4	12.0	15.0	0.3
5	13.0	16.0	0.4
6	15.0	18.0	0.5
7	18.0	20.0	0.6

SOLUTION

Note that the ratio given in this question is not debt to equity ratio. Rather it is the debt to total value ratio. Therefore, if the ratio is 0.6, it means that capital employed comprises 60% debt and 40% equity.

$$K_o = \frac{K_d \times D + K_e \times S}{D + S}$$

In this question total of weight is equal to 1 in all cases, hence we need not to divide by it.

$$1) \quad K_0 = 11\% \times 0 + 13\% \times 1 = 13.00\%$$

$$2) \quad K_0 = 11\% \times 0.1 + 13\% \times 0.9 = 12.80\%$$

$$3) \quad K_0 = 11.6\% \times 0.2 + 14\% \times 0.8 = 13.52\%$$

$$4) \quad K_0 = 12\% \times 0.3 + 15\% \times 0.7 = 14.10\%$$

$$5) \quad K_0 = 13\% \times 0.4 + 16\% \times 0.6 = 14.80\%$$

$$6) \quad K_0 = 15\% \times 0.5 + 18\% \times 0.5 = 16.50\%$$

$$7) \quad K_0 = 18\% \times 0.6 + 20\% \times 0.4 = 18.80\%$$

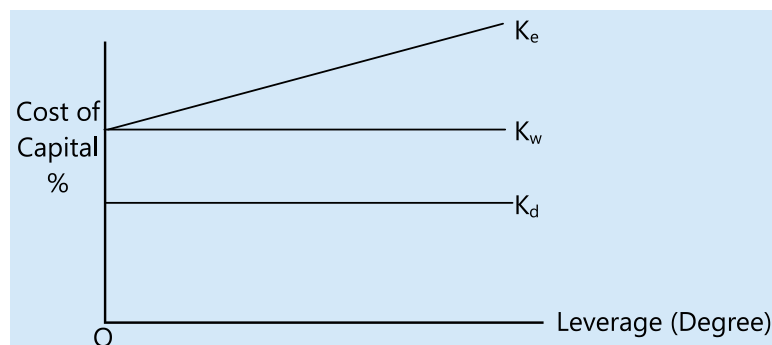
Decision: 2nd option is the best because it has lowest WACC.

2.3 Net Operating Income (NOI) Approach

NOI means Earnings before interest and tax (EBIT). According to this approach, capital structure decisions of the firm are irrelevant.

Any change in the leverage will not lead to any change in the total value of the firm and the market price of shares, as the overall cost of capital is independent of the degree of leverage. As a result, the division between debt and equity is irrelevant.

As per this approach, an increase in the use of debt which is apparently cheaper is offset by an increase in the equity capitalisation rate. This happens because equity investors seek higher compensation as they are opposed to greater risk due to the existence of fixed return securities in the capital structure.



The above diagram shows that K_w (Weighted Average Cost of Capital) and K_d (debt capitalisation rate) are constant and K_e (Cost of equity) increases with leverage.

ILLUSTRATION 4

Amita Ltd.'s operating income (EBIT) is ₹ 5,00,000. The firm's cost of debt is 10% and currently the firm employs ₹ 15,00,000 of debt. The overall cost of capital of the firm is 15%.

You are required to CALCULATE:

- (i) Total value of the firm
- (ii) Cost of equity

SOLUTION

(i) Statement showing total value of the firm

	₹
Net operating income (EBIT)	5,00,000
Less: Interest on debentures (10% of ₹ 15,00,000)	(1,50,000)
Earnings available for equity holders	3,50,000
Total cost of capital (K_0) (given)	15%
Value of the firm (V) = $\frac{EBIT}{k_0} = \frac{₹ 5,00,000}{0.15}$	33,33,333

(ii) Calculation of cost of equity

	₹
Market value of debt (D)	15,00,000
Market value of equity (S) = $V - D = ₹ 33,33,333 - ₹ 15,00,000$	18,33,333

$$K_e = \frac{\text{Earnings available for equity holders}}{\text{Value of equity (S)}}$$

$$\text{Or, } = \frac{EBIT - \text{Interest paid on debt}}{\text{Market value of equity}} = \frac{₹ 3,50,000}{₹ 18,33,333} = 19.09\%$$

OR

$$K_o = K_e \left(\frac{S}{V} \right) + K_d \left(\frac{D}{V} \right)$$

$$K_e = K_o \left(\frac{V}{S} \right) - K_d \left(\frac{D}{S} \right)$$

$$= 0.15 \left(\frac{₹ 33,33,333}{₹ 18,33,333} \right) - 0.10 \left(\frac{₹ 15,00,000}{₹ 18,33,333} \right)$$

$$= \frac{1}{₹ 18,33,333} [(0.15 \times ₹ 33,33,333) - (0.10 \times ₹ 15,00,000)]$$

$$= \frac{1}{₹ 18,33,333} [5,00,000 - 1,50,000]$$

$$= 19.09\%$$

ILLUSTRATION 5

Alpha Ltd. and Beta Ltd. are identical except for capital structure. Alpha Ltd. has 50 per cent debt and 50 per cent equity, whereas Beta Ltd. has 20 per cent debt and 80 per cent equity (All percentages are in market-value terms). The borrowing rate for both the companies is 8 per cent in a no-tax world, and capital markets are assumed to be perfect.

- (a) (i) *If you own 2 per cent of the shares of Alpha Ltd., DETERMINE your return if the company has net operating income of ₹ 3,60,000 and the overall capitalisation rate of the company (K_o) is 18 per cent.*
- (ii) *CALCULATE the implied required rate of return on equity of Alpha Ltd.*
- (b) *Beta Ltd. has the same net operating income as Alpha Ltd.*
- (i) *CALCULATE the implied required rate of return on equity of Beta Ltd.*
- (ii) *ANALYSE why does it differ from that of Alpha Ltd.*

SOLUTION

(a) Value of the Alpha Ltd. = $\frac{\text{NOI}}{K_0} = \frac{\text{₹ } 3,60,000}{18\%} = \text{₹ } 20,00,000$

(i) Return on Equity shares of Alpha Ltd.

	₹
Value of the company	20,00,000
Market value of debt (50% × ₹ 20,00,000)	10,00,000
Market value of equity (50% × ₹ 20,00,000)	10,00,000
	₹
Net operating income	3,60,000
Less: Interest on debt (8% × ₹ 10,00,000)	80,000
Earnings available to equity shareholders	2,80,000
Return on 2% equity shares (2% × ₹ 2,80,000)	5,600

(ii) Implied required rate of return on equity of Alpha Ltd.

$$= \frac{\text{Earnings available for equity shareholders}}{\text{Market value of Equity}} = \frac{\text{₹ } 2,80,000}{\text{₹ } 10,00,000} = 28\%$$

(b) (i) Calculation of Implied rate of return on equity of Beta Ltd.

	₹
Total value of company	20,00,000
Market value of debt (20% × ₹ 20,00,000)	4,00,000
Market value of equity (80% × ₹ 20,00,000)	16,00,000
	₹
Net operating income	3,60,000
Less: Interest on debt (8% × ₹ 4,00,000)	32,000
Earnings available to shareholders	3,28,000

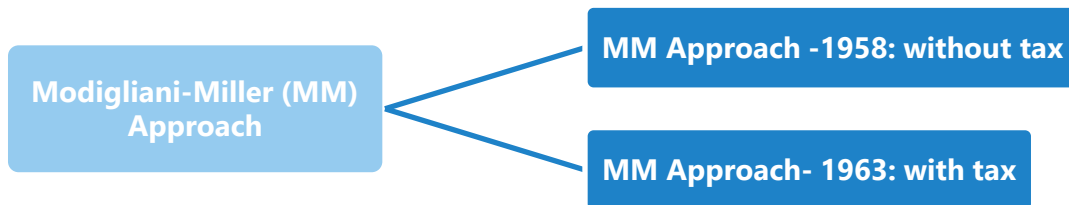
Implied required rate of return on equity

$$= \frac{\text{Earnings available for equity shareholders}}{\text{Market value of Equity}} = \frac{\text{₹ 3,28,000}}{\text{₹ 16,00,000}} = 20.5\%$$

- (ii) Implied required rate of return on equity of Beta Ltd. is lower than that of Alpha Ltd. because Beta Ltd. uses less debt in its capital structure. As the equity capitalisation is a linear function of the debt-to-equity ratio when we use the net operating income approach, the decline in required equity return offsets exactly the disadvantage of not employing so much in the way of “cheaper” debt funds.

2.4 Modigliani-Miller (MM) Approach

The NOI approach is definitional or conceptual and lacks behavioural significance. It does not provide operational justification for irrelevance of capital structure. However, Modigliani-Miller (MM) approach provides behavioural justification for constant overall cost of capital and therefore, total value of the firm.



MM Approach – 1958: without tax:

This approach describes, in a perfect capital market where there is no transaction cost and no taxes, the value and cost of capital of a company remain unchanged irrespective of change in the capital structure. This approach is based on further following additional assumptions:

- ◆ Capital markets are perfect. All information is freely available and there are no transaction costs.
- ◆ All investors are rational.
- ◆ Firms can be grouped into 'Equivalent risk classes' on the basis of their business risk.
- ◆ Non-existence of corporate taxes.

Based on the above assumptions, Modigliani-Miller approach derived the following three propositions:

- (i) Total market value of a firm is equal to its expected net operating income divided by the discount rate appropriate to its risk class decided by the market.

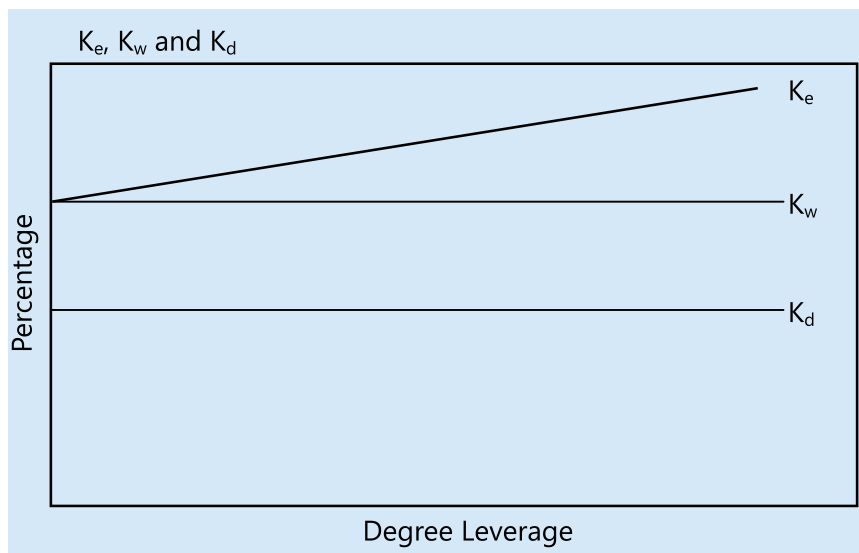
$$\text{Value of levered firm (V}_g\text{)} = \text{Value of unlevered firm (V}_u\text{)}$$

$$\text{Value of a firm} = \frac{\text{Net Operating Income (NOI)}}{K_0}$$

- (ii) A firm having debt in its capital structure has higher cost of equity than an unlevered firm. The cost of equity will include risk premium for the financial risk. The cost of equity in a levered firm is determined as under:

$$K_e = K_o + (K_o - K_d) \frac{\text{Debt}}{\text{Equity}}$$

- (iii) The structure of the capital (financial leverage) does not affect the overall cost of capital. The cost of capital is only affected by the business risk.



It is evident from the above diagram that the average cost of the capital (K_w) is constant and is not affected by leverage.

The operational justification of Modigliani-Miller hypothesis is explained through the functioning of the arbitrage process and substitution of corporate leverage by personal leverage. Arbitrage refers to buying asset or security at lower price in

one market and selling it at a higher price in another market. As a result, equilibrium is attained in different markets. This is illustrated by taking two identical firms of which one has debt in the capital structure while the other does not. Investors of the firm whose value is higher will sell their shares and instead buy the shares of the firm whose value is lower. They will be able to earn the same return at lower outlay with the same perceived risk or lower risk. They would, therefore, be better off.

The value of the levered firm can neither be greater nor lower than that of an unlevered firm according to this approach. The two must be equal. There is neither advantage nor disadvantage in using debt in the firm's capital structure.

This approach considers capital structure of a firm as a whole pie divided into equity, debt and other securities. No matter how the capital structure of a firm is divided (among debt, equity etc.), there is a conservation of investment value. Since the total investment value of a corporation depends upon its underlying profitability and risk, it is invariant with respect to relative changes in the firm's financial capitalisation.

According to MM hypothesis, since the sum of the parts must be equal to the whole, therefore, regardless of the financing mix, the total value of the firm stays the same.

The shortcoming of this approach is that the suggested arbitrage process will fail to work because of imperfections in capital market, existence of transaction cost and presence of corporate income taxes.

MM Approach-1963: with tax

In 1963, MM model was amended by incorporating tax, they recognised that the value of the firm will increase, or cost of capital will decrease where corporate taxes exist. As a result, there will be some difference in the earnings of equity and debt-holders in levered and unlevered firm and value of levered firm will be greater than the value of unlevered firm by an amount equal to amount of debt multiplied by corporate tax rate.

MM has developed the following formulae for computation of cost of capital (K_o), cost of equity (K_e) for the levered firm.

(i) Value of a levered company = Value of an unlevered company + Tax benefit

Or,
$$V_g = V_u + TB$$

(ii) Cost of equity in a levered company (K_{eg}) = $K_{eu} + (K_{eu} - K_d) \frac{\text{Debt}}{\text{Debt} + \text{Equity}}$

Where,

K_{eg} = Cost of equity in a levered company

K_{eu} = Cost of equity in an unlevered company

K_d = Cost of debt

TB = Present Value of Tax Shields

(iii) WACC in a levered company (K_{og}) = $K_{eu} (1 - tL)$

Where,

K_{og} = WACC of a levered company

K_{eu} = Cost of equity in an unlevered company

t = Tax rate

$$L = \frac{\text{Debt}}{\text{Debt} + \text{Equity}}$$

ILLUSTRATION 6

(When value of levered firm is more than the value of unlevered firm)

There are two companies N Ltd. and M Ltd., having same earnings before interest and taxes (EBIT) of ₹ 20,000. M Ltd. is a levered company having a debt of ₹1,00,000 @ 7% rate of interest. The cost of equity of N Ltd. is 10% and of M Ltd. is 11.50%.

COMPUTE how arbitrage process will be carried on?

SOLUTION

	Company	
	M Ltd.	N Ltd.
EBIT (NOI)	₹ 20,000	₹ 20,000
Debt (D)	₹ 1,00,000	--
K_e	11.50%	10%
K_d	7%	--

$$\text{Value of equity (S)} = \frac{\text{NOI} - \text{Interest}}{\text{Cost of equity}}$$

$$S_M = \frac{₹20,000 - ₹7,000}{11.50\%} = ₹ 1,13,043$$

$$S_N = \frac{₹20,000}{10\%} = ₹ 2,00,000$$

$$\text{Value of Firm (V)} = S + D$$

$$V_M = ₹ 1,13,043 + ₹ 1,00,000 = ₹ 2,13,043$$

$$V_N = ₹ 2,00,000$$

Arbitrage Process:

If you have 10% shares of M Ltd., your value of investment in equity shares is 10% of ₹ 1,13,043 i.e. ₹ 11,304.30 and return will be 10% of (₹20,000 – ₹ 7,000) = ₹ 1,300.

Alternate Strategy will be:

Sell your 10% shares of levered firm for ₹ 11,304.30 and borrow 10% of levered firm's debt i.e. ₹ 10,000 (10% of ₹ 1,00,000) and invest the money i.e. 10% in unlevered firm's stock:

Total resources /Money we have = ₹ 11,304.30 + ₹ 10,000 = ₹ 21,304.3 and you invest 10% of ₹ 2,00,000 = ₹ 20,000

Surplus cash available with you is = ₹ 21,304.3 – ₹ 20,000 = ₹ 1,304.3

Your return = 10% EBIT of unlevered firm – Interest to be paid on borrowed funds

i.e. = 10% of ₹ 20,000 – 7% of ₹ 10,000 = ₹ 2,000 – ₹ 700 = ₹ 1,300

Now your return remains the same i.e. ₹ 1,300 which you are getting from N Ltd. before investing in M Ltd. but still you have ₹ 1,304.3 excess money available with you. Hence, you are better off by doing arbitrage.

In the above example you have not invested entire amount received from “sale of shares of levered company plus amount borrowed”. You maintained same level of earning and reduced investment. Alternatively, you could have invested entire amount in unlevered company. In that case your annual earnings would have increased. An example for the same is as follows:

ILLUSTRATION 7

Following data is available in respect of two companies having same business risk:

Capital employed = ₹ 2,00,000, EBIT = ₹ 30,000 and $K_e = 12.5\%$

Sources	Levered Company (₹)	Unlevered Company (₹)
Debt (@10%)	1,00,000	Nil
Equity	1,00,000	2,00,000

An investor is holding 15% shares in levered company. CALCULATE the increase in annual earnings of investor if he switches his holding from Levered to Unlevered company.

SOLUTION

1. Valuation of firms

Particulars	Levered Firm (₹)	Unlevered Firm (₹)
EBIT	30,000	30,000
Less: Interest on debt ($10\% \times ₹ 1,00,000$)	10,000	Nil
Earnings available to Equity shareholders	20,000	30,000
K_e	12.5%	12.5%
Value of Equity (S) (Earnings available to Equity shareholders/ K_e)	1,60,000	2,40,000
Debt (D)	1,00,000	Nil
Value of Firm (V) = S + D	2,60,000	2,40,000

Value of Levered company is more than that of unlevered company. Therefore, investor will sell his shares in levered company and buy shares in unlevered company. To maintain the level of risk he will borrow proportionate amount and invest that amount also in shares of unlevered company.

2. Investment & Borrowings

	₹
Sell shares in Levered company ($₹ 1,60,000 \times 15\%$)	24,000
Borrow money ($₹ 1,00,000 \times 15\%$)	<u>15,000</u>
Buy shares in Unlevered company	<u>39,000</u>

3. Change in Return

	₹
Income from shares in Unlevered company ($₹ 39,000 \times 12.5\%$)	4,875
Less: Interest on loan ($₹ 15,000 \times 10\%$)	<u>1,500</u>
Net Income from unlevered firm	3,375
Less: Income from Levered firm ($₹ 24,000 \times 12.5\%$)	<u>3,000</u>
Incremental Income due to arbitrage	<u>375</u>

ILLUSTRATION 8

(When value of unlevered firm is more than the value of levered firm.)

There are two companies U Ltd. and L Ltd., having same NOI of ₹ 20,000 except that L Ltd. is a levered company having a debt of ₹ 1,00,000 @ 7% and cost of equity of U Ltd. & L Ltd. are 10% and 18% respectively.

COMPUTE how arbitrage process will work.

SOLUTION

Particulars	Company	
	U Ltd.	L Ltd.
NOI (EBIT)	₹ 20,000	₹ 20,000
Debt (D)	–	₹ 1,00,000
K_d	–	7%
K_e	10%	18%
Value of equity capital (S)	₹ 2,00,000	₹ 72,222
$\left(\frac{\text{EBIT} - \text{Interest}}{K_e} \right)$	$\left(\frac{20,000}{0.10} \right)$	$\left(\frac{20,000 - 7,000}{0.18} \right)$
Total value of the firm (V) = S + D	₹ 2,00,000	₹ 1,72,222 (₹ 72,222 + ₹1,00,000)

Arbitrage Process:

If you have 10% shares of unlevered firm i.e. investment of 10% of ₹ 2,00,000 = ₹ 20,000 and Return @ 10% on ₹ 20,000. Investment will be 10% of earnings available for equity i.e. $10\% \times ₹ 20,000 = ₹ 2,000$.

Alternative strategy will be:

Sell your shares in unlevered firm for ₹ 20,000 and buy 10% shares of levered firm's equity plus debt.

10% equity of levered firm	₹ 7,222
10% debt of levered firm	<u>₹ 10,000</u>
Total investment in levered firm	<u>₹ 17,222</u>

Your resources are ₹ 20,000

Surplus cash available = Surplus – Investment = ₹ 20,000 – ₹ 17,222 = ₹ 2,778

Your return on investment is:

7% on debt of ₹ 10,000	₹ 700
10% on equity i.e. 10% of earnings available for equity holders ($10\% \times ₹ 13,000$)	<u>₹ 1,300</u>
Total return	<u>₹ 2,000</u>

In both the cases the return received is ₹ 2,000 and still you have excess cash of ₹2,778.

Hence, you are better off by doing arbitrage i.e. you will start selling unlevered company shares and buy levered company's shares thereby pushing down the value of shares of unlevered firm and increasing the value of levered firm till equilibrium is reached.

In the above example we have not invested entire amount received from "sale of shares of Unlevered company". We also have the same level of earning along with reduced investment. Alternatively, we could have invested entire amount in Levered company. In that case annual earnings would have increased. An example for the same is as follows:

ILLUSTRATION 9

Following data is available in respect of two companies having same business risk:

Capital employed = ₹2,00,000, EBIT = ₹30,000

Sources	Levered Company (₹)	Unlevered Company (₹)
Debt (@10%)	1,00,000	Nil
Equity	1,00,000	2,00,000
K_e	20%	12.5%

An investor is holding 15% shares in Unlevered company. CALCULATE the increase in annual earnings of investor if he switches his holding from Unlevered to Levered Company.

SOLUTION

1. Valuation of firms

Particulars	Levered Firm (₹)	Unlevered Firm (₹)
EBIT	30,000	30,000
Less: Interest on debt (10% × ₹ 1,00,000)	10,000	Nil
Earnings available to Equity shareholders	20,000	30,000

K_e	20%	12.5%
Value of Equity (S) (Earnings available to Equity shareholders/ K_e)	1,00,000	2,40,000
Debt (D)	1,00,000	Nil
Value of Firm (V) = S + D	2,00,000	2,40,000

Value of Unlevered company is more than that of Levered company therefore investor will sell his shares in Unlevered company and buy shares in Levered company. Market value of Debt and Equity of Levered company are in the ratio of ₹ 1,00,000 : ₹ 1,00,000 i.e. 1:1. To maintain the level of risk he will lend proportionate amount (50%) and invest balance amount (50%) in shares of Levered company.

2. Investment & Borrowings	₹
Sell shares in Unlevered company (₹ 2,40,000 x 15%)	<u>36,000</u>
Lend money (₹ 36,000 x 50%)	18,000
Buy shares in Levered company (₹ 36,000 x 50%)	<u>18,000</u>
Total	<u>36,000</u>
3. Change in Return	₹
Income from shares in Levered company (₹ 18,000 x 20%)	3,600
Interest on money lent (₹ 18,000 x 10%)	<u>1,800</u>
Total Income after switch over	5,400
Less: Income from Unlevered firm (₹ 36,000 x 12.5%)	<u>4,500</u>
Incremental Income due to arbitrage	<u>900</u>

ILLUSTRATION 10

Blue Ltd., an all equity financed company is considering the repurchase of ₹ 275 lakhs equity shares and to replace it with 15% debentures of the same amount. Current market value of the company is ₹ 1,750 lakhs with its cost of capital of 20%. The company's Earnings before Interest and Taxes (EBIT) are expected to remain constant in future years. The company also has a policy of distributing its entire earnings as dividend.

Assuming the corporate tax rate as 30%, you are required to CALCULATE the impact on the following on account of the change in the capital structure as per Modigliani and Miller (MM) Approach:

- (i) Market value of the company
- (ii) Overall Cost of capital
- (iii) Cost of equity

SOLUTION

Workings:

$$\begin{aligned} \text{Market Value of Equity} &= \frac{\text{Net income (NI) for equity holders}}{K_e} \\ ₹ 1,750 \text{ lakhs} &= \frac{\text{Net income (NI) for equity holders}}{0.20} \\ \text{Net Income to equity holders/EAT} &= ₹ 350 \text{ lakhs} \\ \text{Therefore, EBIT} &= \frac{\text{EAT}}{(1-t)} = \frac{₹ 350 \text{ lakhs}}{(1-0.3)} = ₹ 500 \text{ lakhs} \end{aligned}$$

Income Statement

	All Equity (₹ In lakhs)	Equity & Debt (₹ In lakhs)
EBIT (as calculated above)	500	500.00
Interest on ₹ 275 lakhs @ 15%	-	41.25
EBT	500	458.75
Tax @ 30%	150	137.63
Income available to equity holders	350	321.12

(i) Market value of the company

$$\begin{aligned} \text{Market value of levered firm} &= \text{Value of unlevered firm} + \text{Tax Advantage} \\ &= ₹ 1,750 \text{ lakhs} + (₹ 275 \text{ lakhs} \times 0.3) \\ &= ₹ 1,832.5 \text{ lakhs} \end{aligned}$$

$$\begin{aligned} \text{Change in market value of the company} &= ₹ 1,832.5 \text{ lakhs} - ₹ 1,750 \text{ lakhs} \\ &= ₹ 82.50 \text{ lakhs} \end{aligned}$$

The impact is that the market value of the company has increased by ₹ 82.50 lakhs due to replacement of equity with debt.

(ii) Overall Cost of Capital

Market Value of Equity = Market value of levered firm - Equity repurchased

$$= ₹ 1,832.50 \text{ lakhs} - ₹ 275 \text{ lakhs} = ₹ 1,557.50 \text{ lakhs}$$

$$\text{Cost of Equity (K}_e\text{)} = \frac{\text{Net Income to equity holders}}{\text{Market value of equity}} \times 100$$

$$= \frac{₹ 321.12 \text{ lakhs}}{₹ 1,557.50 \text{ lakhs}} \times 100 = 20.62\%$$

$$\text{Cost of debt (K}_d\text{)} = I (1 - t) = 15 (1 - 0.3) = 10.50\%$$

Components	Amount (₹ In lakhs)	Cost of Capital %	Weight	WACC (K _o) %
Equity	1,557.50	20.62	0.85	17.53
Debt	275.00	10.50	0.15	1.58
	1,832.50		1	19.11

The impact is that the Overall Cost of Capital or K_o has fallen by 0.89% (20% - 19.11%) due to the benefit of tax relief on debt interest payment.

(iii) Cost of Equity

The impact is that cost of equity has risen by 0.62% (20.62% - 20%) due to the presence of financial risk i.e. introduction of debt in capital structure.

Note: Cost of Capital and Cost of equity can also be calculated with the help of following formulas, though there will be no change in the final answers.

$$\text{Cost of Capital (K}_o\text{)} = K_{eu} [1 - (t \times L)]$$

Where,

K_{eu} = Cost of equity in an unlevered company

t = Tax rate

$$L = \frac{\text{Debt}}{\text{Debt} + \text{Equity}}$$

$$\text{So, } K_o = 0.20 \left[1 - \left(0.3 \times \frac{\text{₹ } 275 \text{ lakhs}}{\text{₹ } 1,832.5 \text{ lakhs}} \right) \right] = 0.191 \text{ or } 19.10\% \text{ (approx.)}$$

$$\text{Cost of Equity } (K_e) = K_{eu} + (K_{eu} - K_d) \frac{\text{Debt } (1-t)}{\text{Equity}}$$

Where,

K_{eu} = Cost of equity in an unlevered company

K_d = Cost of debt

t = Tax rate

$$\text{So, } K_e = 0.20 + \left((0.20 - 0.15) \times \frac{\text{₹ } 275 \text{ lakhs } (1 - 0.3)}{\text{₹ } 1,557.5 \text{ lakhs}} \right) = 0.2062 \text{ or } 20.62\%$$

2.5 The Trade-off Theory

The trade-off theory of capital structure refers to the idea that a company chooses how much debt finance and how much equity finance to use by balancing the costs and benefits. Trade-off theory of capital structure basically entails offsetting the costs of debt against the benefits of debt.

Trade-off theory of capital structure primarily deals with two concepts - cost of financial distress and agency costs. An important purpose of the trade-off theory of capital structure is to explain the fact that corporations usually are financed partly with debt and partly with equity.

It states that there is an **advantage** to financing with debt, the **tax benefits** of debt and there is a **cost** of financing with debt, the costs of **financial distress** including bankruptcy costs of debt and non-bankruptcy costs (e.g. staff leaving, suppliers demanding disadvantageous payment terms, bondholder/ stockholder infighting, etc).

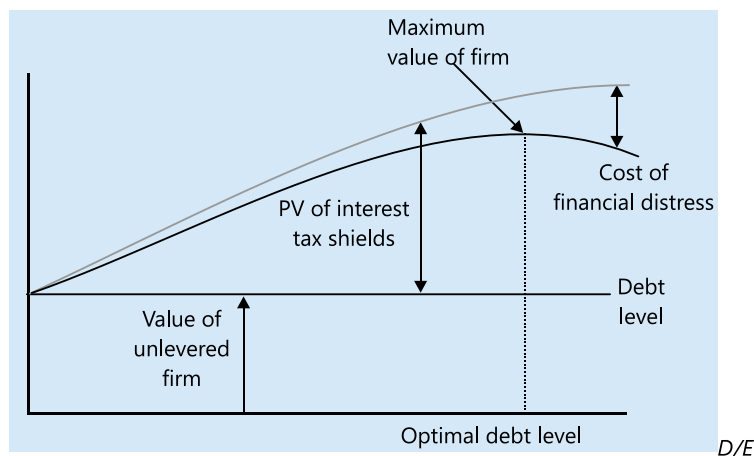
The marginal benefit of further increases in debt declines as debt increases, while the marginal cost increases, so that a firm that is optimizing its overall value will focus on this trade-off when choosing how much debt and equity to use for financing. Modigliani and Miller in 1963 introduced the tax benefit of debt. Later work led to an optimal capital structure which is given by the trade-off theory. According to Modigliani and Miller, the attractiveness of debt decreases with the personal tax on the interest income. A firm experiences financial distress when the

firm is unable to cope with the debt holders' obligations. If the firm continues to fail in making payments to the debt holders, the firm can even be insolvent.

The first element of Trade-off theory of capital structure, considered as the cost of debt is usually the financial distress costs or bankruptcy costs of debt. The **direct cost of financial distress** refers to the cost of insolvency of a company. Once the proceedings of insolvency start, the assets of the firm may be needed to be sold at **distress price**, which is generally much lower than the current values of the assets. A huge amount of administrative and **legal costs** is also associated with the insolvency. Even if the company is not insolvent, the financial distress of the company may include a number of **indirect costs** like - cost of employees, cost of customers, cost of suppliers, cost of investors, cost of managers and cost of shareholders.

The firms may often experience a dispute of interests among the management of the firm, debt holders and shareholders. These disputes generally give birth to agency problems that in turn give rise to the agency costs. The agency costs may affect the capital structure of a firm. There may be two types of conflicts - shareholders-managers conflict and shareholders-debt holders conflict. The introduction of a dynamic Trade-off theory of capital structure makes the predictions of this theory a lot more accurate and reflective of that in practice.

Value of Firm



As the Debt-equity ratio (i.e. leverage) increases, there is a trade-off between the interest tax shield and bankruptcy, causing an optimum capital structure.

2.6 Pecking Order Theory

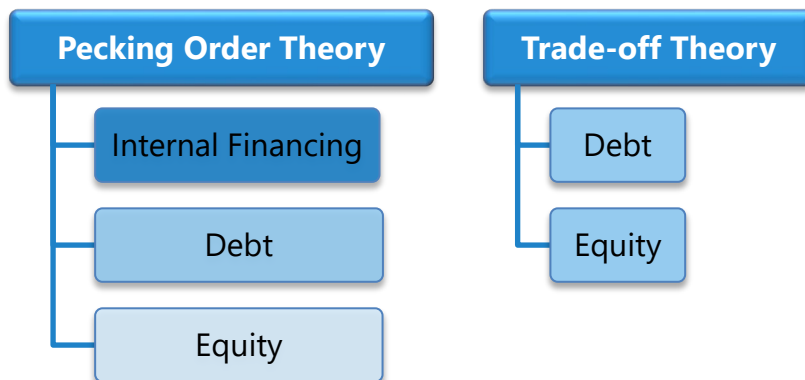
This theory is based on Asymmetric information, which refers to a situation in which different parties have different information. In a firm, managers will have better information than investors. This theory states that firms prefer to issue debt when they are positive about future earnings. Equity is issued when they are doubtful and internal finance is insufficient.

The pecking order theory argues that the capital structure decision is affected by manager's choice of a source of capital that gives higher priority to sources that reveal the least amount of information.

Myers has given the name 'PECKING ORDER' theory as here is no well-defined debt-equity target and there are two kind of equity internal and external. Now Debt is cheaper than both internal and external equity because of interest. Further internal equity is less than external equity particularly because of no transaction/issue cost, no tax etc.

Pecking order theory suggests that managers may use various sources for raising of fund in the following order:

1. Managers first choice is to use **internal finance**.
2. In absence of internal finance, they can use secured **debt**, unsecured debt, hybrid debt etc.
3. Managers may issue new **equity** shares as a last option.



Financial Hierarchy



3. FACTORS DETERMINING CAPITAL STRUCTURE

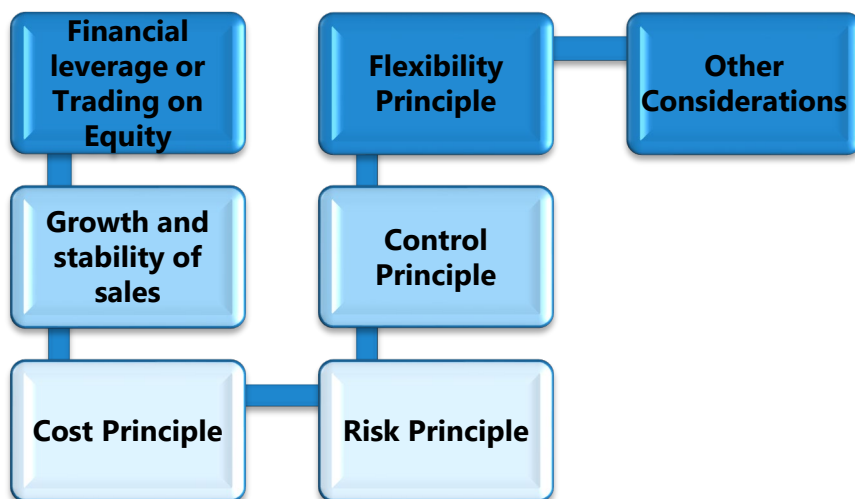
3.1 Choice of source of funds

A firm has the choice to raise funds for financing its investment proposals from different sources in different proportions. It can:

- (a) Exclusively use debt (in case of existing company), or
- (b) Exclusively use equity capital, or
- (c) Exclusively use preference share capital (in case of existing company), or
- (d) Use a combination of debt and equity in different proportions, or
- (e) Use a combination of debt, equity and preference capital in different proportions, or
- (f) Use a combination of debt and preference capital in different proportion (in case of existing company).

The choice of the combination of these sources is called capital structure mix. But the question is which of the pattern should the firm choose?

3.2 Factors affecting capital structure



While choosing a suitable financing pattern, certain fundamental principles should be kept in mind, to design capital structure, which are discussed below:

- (1) **Financial leverage or Trading on Equity:** The use of long-term fixed interest bearing debt and preference share capital along with equity share capital is called financial leverage or trading on equity. The use of long-term debt increases the earnings per share if the firm yields a return higher than the cost of debt. The earnings per share also increase with the use of preference share capital but due to the fact that interest is allowed to be deducted while computing tax, the leverage impact of debt is much more. However, leverage can operate adversely also if the rate of interest on long-term loan is more than the expected rate of earnings of the firm. Therefore, it needs caution to plan the capital structure of a firm.
- (2) **Growth and stability of sales:** The capital structure of a firm is highly influenced by the growth and stability of its sales. If the sales of a firm are expected to remain fairly stable, it can raise a higher level of debt. Stability of sales ensures that the firm will not face any difficulty in meeting its fixed commitments of interest repayments of debt. Similarly, the rate of the growth in sales also affects the capital structure decision. Usually, greater the rate of growth of sales, greater can be the use of debt in the financing of firm. On the other hand, if the sales of a firm are highly fluctuating or declining, it should not employ, as far as possible, debt financing in its capital structure.
- (3) **Cost Principle:** According to this principle, an ideal pattern or capital structure is one that minimizes cost of capital structure and maximizes earnings per share (EPS). For e.g. Debt capital is cheaper than equity capital from the point of its cost and interest being deductible for income tax purpose, whereas no such deduction is allowed for dividends.
- (4) **Risk Principle:** According to this principle, reliance is placed more on common equity for financing capital requirements than excessive use of debt. Use of more and more debt means higher commitment in form of interest payout. This would lead to erosion of shareholders' value in unfavorable business situation. With increase in amount of Debt, financial risk increase and vice versa.

- (5) **Control Principle:** While designing a capital structure, the finance manager may also keep in mind that existing management control and ownership remains undisturbed. Issue of new equity will dilute existing control pattern and it also involves higher cost. Issue of more debt causes no dilution in control but causes a higher degree of financial risk.
- (6) **Flexibility Principle:** By flexibility, it means that the management chooses such a combination of sources of financing which it finds easier to adjust according to changes in need of funds in future too. While debt could be interchanged (If the company is loaded with a debt of 18% and funds are available at 15%, it can return old debt with new debt, at a lesser interest rate), but the same option may not be available in case of equity investment.
- (7) **Other Considerations:** Besides above principles, other factors such as nature of industry, timing of issue and competition in the industry should also be considered. Industries facing severe competition also resort to more equity than debt.

Thus, a finance manager in designing a suitable pattern of capital structure must bring about satisfactory compromise between the above principles. The compromise can be reached by assigning weights to these principles in terms of various characteristics of the company.



4. OPTIMAL CAPITAL STRUCTURE

Objective of financial management is to **maximize wealth**. Therefore, one should choose a capital structure which maximizes wealth. For this purpose, following analysis should be done:

- (1) **EBIT-EPS-MPS analysis:** Chose a capital structure which maximizes market price per share. For that, start with same EBIT for all capital structures and calculate EPS. Thereafter, either multiply EPS by price earning ratio or divide it by cost of equity to arrive at MPS.
- (2) **Indifference Point analysis:** In above analysis, we have considered value at a given EBIT only. What will happen if EBIT changes? Will it change your

decision also? To answer this question, you can do indifference point analysis.

- (3) Financial Break-Even Point (BEP) analysis: With change in capital structure, financial risk also changes. Though this risk has already been considered in PE ratio or in cost of equity in point one above, but one may calculate and consider it separately also by calculating Financial BEP.

5. EBIT-EPS-MPS ANALYSIS

5.1 Relationship between EBIT-EPS-MPS

The basic objective of financial management is to design an appropriate capital structure which can provide the highest wealth, i.e., highest MPS, which in turn depends on EPS.

Given a level of EBIT, EPS will be different under different financing mix depending upon the extent of debt financing. The effect of leverage on the EPS emerges because of the existence of fixed financial charge i.e., interest on debt, financial fixed dividend on preference share capital. The effect of fixed financial charge on the EPS depends upon the relationship between the rate of return on assets and the rate of fixed charge. If the rate of return on assets is higher than the cost of financing, then the increasing use of fixed charge financing (i.e., debt and preference share capital) will result in increase in the EPS. This situation is also known as favourable financial leverage or Trading on Equity. On the other hand, if the rate of return on assets is less than the cost of financing, then the effect may be negative and, therefore, the increasing use of debt and preference share capital may reduce the EPS of the firm.

The fixed financial charge financing may further be analysed with reference to the choice between the debt financing and the issue of preference shares. Theoretically, the choice is tilted in favour of debt financing for two reasons: (i) the explicit cost of debt financing i.e., the rate of interest payable on debt instruments or loans is generally lower than the rate of fixed dividend payable on preference shares, and (ii) interest on debt financing is tax-deductible and therefore the real cost (after-tax) is lower than the cost of preference share capital.

Thus, the analysis of the different types of capital structure and the effect of leverage on the expected EPS and eventually MPS will provide a useful guide to selection of a particular level of debt financing. The EBIT-EPS analysis is of significant importance and if undertaken properly, can be an effective tool in the hands of a financial manager to get an insight into the planning and designing of the capital structure of the firm.

ILLUSTRATION 11

Suppose that a firm has an all equity capital structure consisting of 1,00,000 ordinary shares of ₹ 10 per share. The firm wants to raise ₹ 2,50,000 to finance its investments and is considering three alternative methods of financing – (i) to issue 25,000 ordinary shares at ₹ 10 each, (ii) to borrow ₹ 2,50,000 at 8 per cent rate of interest, (iii) to issue 2,500 preference shares of ₹ 100 each at an 8 per cent rate of dividend. If the firm's earnings before interest and taxes after additional investment are ₹ 3,12,500 and the tax rate is 50 per cent, FIND the effect on the earnings per share under the three financing alternatives.

SOLUTION

EPS under alternative financing plans:

Particulars	Equity Financing (₹)	Debt Financing (₹)	Preference Financing (₹)
EBIT	3,12,500	3,12,500	3,12,500
Less: Interest	0	20,000	0
PBT	3,12,500	2,92,500	3,12,500
Less: Taxes	1,56,250	1,46,250	1,56,250
PAT	1,56,250	1,46,250	1,56,250
Less: Preference dividend	0	0	20,000
Earnings available to ordinary shareholders	1,56,250	1,46,250	136,250
Shares outstanding	1,25,000	1,00,000	1,00,000
EPS	1.25	1.46	1.36

The firm is able to maximize the earnings per share when it uses debt financing. Though the rate of preference dividend is equal to the rate of interest, EPS is high in case of debt financing because interest charges are tax deductible while preference dividends are not. With increasing levels of EBIT, EPS will increase at a faster rate with a high degree of leverage.

We know that market price per share is equal to earning per share multiplied by price earning (PE) ratio. If PE ratio is same for all three plans, then the plan which has highest EPS will also have highest MPS and it will be selected. On the other hand, if PE ratio for equity plan is 10 times, for debt plan it is 8 times and for preference plan it is 7 times then:

EPS	1.25	1.46	1.36
PE ratio	x10	x8	x7
MPS	12.50	11.68	9.52

Now despite of lower EPS, equity plan will be selected because it has highest MPS.

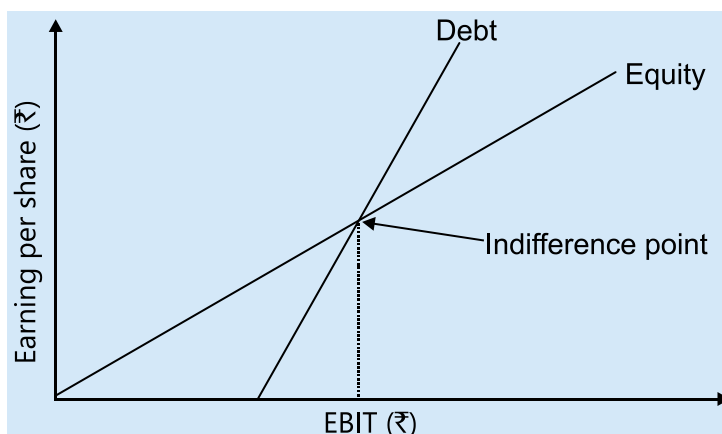
However, if a company is not able to earn a rate of return on its assets higher than the interest rate (or the preference dividend rate), debt (or preference financing) will have an adverse impact on EPS. Suppose the firm in illustration above has an EBIT of ₹75,000, then EPS under different methods will be as follows:

EPS under alternative financing methods: Unfavourable EBIT:

Particulars	Equity Financing (₹)	Debt Financing (₹)	Preference Financing (₹)
EBIT	75,000	75,000	75,000
Less: Interest	0	20,000	0
PBT	75,000	55,000	75,000
Less: Taxes	37,500	27,500	37,500
PAT	37,500	27,500	37,500
Less: Preference dividend	0	0	20,000
Earnings available to ordinary shareholders	37,500	27,500	17,500
Shares outstanding	1,25,000	1,00,000	1,00,000
EPS	0.30	0.275	0.175

It is obvious that under unfavourable conditions i.e.,] when the rate of return on the total assets is less than the cost of debt, the earnings per share will fall with the degree of leverage.

5.2 Financial Break-Even Point (BEP) and Indifference Point Analysis



Financial break-even point is the minimum level of EBIT needed to satisfy all the fixed financial charges i.e. interests and preference dividends. It denotes the level of EBIT for which the company's **EPS equals zero**.

Financial breakeven point (BEP) can be calculated as:

$$\text{Financial Break-even point} = \frac{\text{Interest} + \text{Preference dividend}}{(1 - \text{tax rate})}$$

If the EBIT is less than the financial break-even point, then the EPS will be negative but if the expected level of EBIT is more than the break-even point, then more fixed costs financing instruments can be taken in the capital structure, otherwise, equity would be preferred.

EBIT-EPS break-even analysis is used for determining the appropriate amount of debt a company might carry.

Another method of considering the impact of various financing alternatives on earnings per share is to prepare the EBIT chart or the range of Earnings chart. This chart shows the likely EPS at various probable EBIT levels. Thus, under one particular alternative, EPS may be ₹ 2 at a given EBIT level. However, the EPS may go down if another alternative of financing is chosen even though the EBIT remains at the same level. At a given EBIT, earnings per share under various

alternatives of financing may be plotted. A straight line representing the EPS at various levels of EBIT under the alternative may be drawn. Wherever this line intersects, it is known as **break-even point**. This point is a useful guide in formulating the capital structure. This is known as EPS equivalency point or indifference point since this shows that, between the two given alternatives of financing (i.e., regardless of leverage in the financial plans), EPS would be the same at the given level of EBIT.

The equivalency or indifference point can also be calculated algebraically in the following manner:

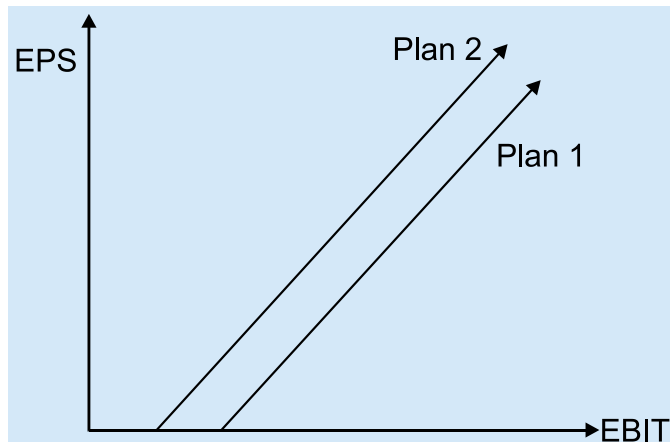
$$\frac{(EBIT - I_1)(1 - t)}{E_1} = \frac{(EBIT - I_2)(1 - t)}{E_2}$$

Where,

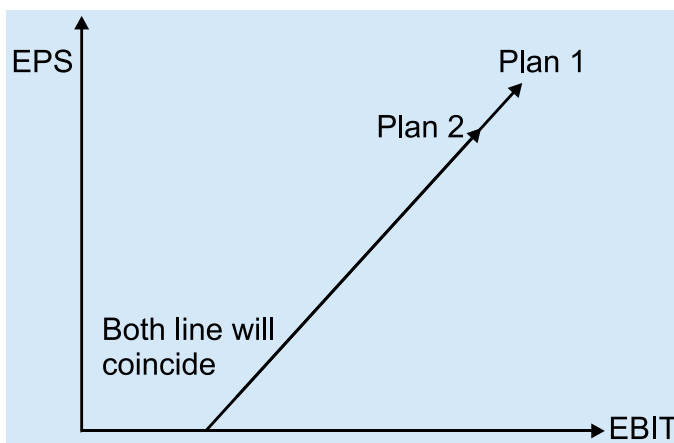
EBIT	=	Indifference point
E_1	=	Number of equity shares in Alternative 1
E_2	=	Number of equity shares in Alternative 2
I_1	=	Interest charges in Alternative 1
I_2	=	Interest charges in Alternative 2
t	=	Tax-rate

Just keep in mind that if amount of equity share capital is same under two financial plans, then one of the following two situations will arise:

1. **No indifference point:** If after tax cost of the source other than equity shares is **not same** under both plans then there will be no indifference point between the two. Because one plan will be better than other at all levels of EBIT. For example, if two plans have equity shares of ₹ 1,00,000 each. Plan 1 has 10% debentures of ₹ 50,000 while plan 2 has 8% Term loan of ₹ 50,000. Then plan 2 will be better than plan 1 at any level of EBIT and there will be no indifference point.



2. **Many indifference points:** If after tax cost of the source other than equity shares is **same** under both plans then each EBIT will be an indifference point.



Debt-Equity Indifference Point

ILLUSTRATION 12

Best of Luck Ltd., a profit making company, has a paid-up capital of ₹ 100 lakhs consisting of 10 lakhs ordinary shares of ₹ 10 each. Currently, it is earning an annual pre-tax profit of ₹ 60 lakhs. The company's shares are listed and are quoted in the range of ₹ 50 to ₹ 80. The management wants to diversify production and has approved a project which will cost ₹ 50 lakhs and which is expected to yield a pre-tax income of ₹ 40 lakhs per annum. To raise this additional capital, the following options are under consideration of the management:

- (a) To issue equity share capital for the entire additional amount. It is expected that the new shares (face value of ₹ 10) can be sold at a premium of ₹ 15.
- (b) To issue 16% non-convertible debentures of ₹ 100 each for the entire amount.
- (c) To issue equity capital for ₹ 25 lakhs (face value of ₹ 10) and 16% non-convertible debentures for the balance amount. In this case, the company can issue shares at a premium of ₹ 40 each.

ADVISE which option is the most suitable to raise the additional capital, keeping in mind that the management wants to maximize the earnings per share to maintain its goodwill. The company is paying income tax at 50%.

SOLUTION

Calculation of Earnings per share under the three options:

Particulars	Options		
	Option I: Issue Equity shares only	Option II: Issue 16% Debentures only	Option III: Issue Equity Shares and 16% Debentures of equal amount
Number of Equity Shares			
- Existing	10,00,000	10,00,000	10,00,000
- Newly issued	2,00,000 $\left(\frac{₹50,00,000}{₹(10+15)} \right)$	---	50,000 $\left(\frac{₹25,00,000}{₹(10+40)} \right)$
Total	12,00,000	10,00,000	10,50,000
16% Debentures (₹)	---	50,00,000	25,00,000

	₹	₹	₹
Profit Before Interest and Tax:			
- Existing pre-tax profit	60,00,000	60,00,000	60,00,000
- From new projects	40,00,000	40,00,000	40,00,000
	1,00,00,000	1,00,00,000	1,00,00,000
Less: Interest on 16% Debentures	---	8,00,000 (16% × ₹50,00,000)	4,00,000 (16% × ₹25,00,000)
Profit Before Tax	1,00,00,000	92,00,000	96,00,000
Less: Tax at 50%	50,00,000	46,00,000	48,00,000
Profit After Tax	50,00,000	46,00,000	48,00,000
Earnings Per Share (EPS)	4.17	4.60	4.57
$\left(\frac{\text{PAT}}{\text{No. of Shares}} \right)$	$\left(\frac{₹ 50,00,000}{12,00,000} \right)$	$\left(\frac{₹ 46,00,000}{10,00,000} \right)$	$\left(\frac{₹ 48,00,000}{10,50,000} \right)$

Advise: Option II i.e., issue of 16% Debentures is most suitable to maximize the earnings per share.

ILLUSTRATION 13

Shahji Steel Limited requires ₹ 25,00,000 for a new plant. This plant is expected to yield earnings before interest and taxes of ₹ 5,00,000. While deciding about the financial plan, the company considers the objective of maximizing earnings per share. It has three alternatives to finance the project - by raising debt of ₹ 2,50,000 or ₹ 10,00,000 or ₹ 15,00,000 and the balance, in each case, by issuing equity shares. The company's share is currently selling at ₹ 150 but is expected to decline to ₹ 125 in case the funds are borrowed in excess of ₹ 10,00,000. The funds can be borrowed at the rate of 10 percent upto ₹ 2,50,000, at 15 percent over ₹ 2,50,000 and upto ₹ 10,00,000 and at 20 percent over ₹ 10,00,000. The tax rate applicable to the company is 50 percent. ANALYSE which form of financing should the company choose?

SOLUTION

Plan I = Raising Debt of ₹ 2.5 lakh + Equity of ₹ 22.5 lakh

Plan II = Raising Debt of ₹ 10 lakh + Equity of ₹ 15 lakh

Plan III = Raising Debt of ₹ 15 lakh + Equity of ₹ 10 lakh

Calculation of Earnings per share (EPS):

Particulars	FINANCIAL PLANS		
	Plan I	Plan II	Plan III
	₹	₹	₹
Expected EBIT	5,00,000	5,00,000	5,00,000
Less: Interest ^(a)	(25,000)	(1,37,500)	(2,37,500)
Earnings before taxes	4,75,000	3,62,500	2,62,500
Less: Taxes @ 50%	(2,37,500)	(1,81,250)	(1,31,250)
Earnings after taxes (EAT)	2,37,500	1,81,250	1,31,250
Number of shares ^(b)	15,000	10,000	8,000
Earnings per share (EPS)	15.83	18.13	16.41

Financing Plan II (i.e. Raising debt of ₹ 10 lakh and issue of equity share capital of ₹ 15 lakh) is the option which maximises the earnings per share.

Working Notes:**(a) Calculation of interest on Debt**

Plan		₹	₹
I	(₹ 2,50,000 × 10%)		25,000
II	(₹ 2,50,000 × 10%)	25,000	
	(₹ 7,50,000 × 15%)	1,12,500	1,37,500
III	(₹ 2,50,000 × 10%)	25,000	
	(₹ 7,50,000 × 15%)	1,12,500	
	(₹ 5,00,000 × 20%)	1,00,000	2,37,500

(b) Number of equity shares to be issued

$$\text{Plan I} = \frac{\text{₹ } 22,50,000}{\text{₹ } 150 \text{ (Market price of share)}} = 15,000 \text{ shares}$$

$$\text{Plan II} = \frac{\text{₹ } 15,00,000}{\text{₹ } 150} = 10,000 \text{ shares}$$

$$\text{Plan III} = \frac{\text{₹ } 10,00,000}{\text{₹ } 125} = 8,000 \text{ shares}$$

ILLUSTRATION 14

The following data are presented in respect of Quality Automation Ltd.:

	(₹)
Profit before interest and tax	52,00,000
Less: Interest on debentures @ 12%	12,00,000
Profit before tax	40,00,000
Less: Income tax @ 50%	20,00,000
Profit After tax	20,00,000
No. of equity shares (of ₹ 10 each)	8,00,000
EPS	2.5
PE Ratio	10
Market price per share	25

The company is planning to start a new project requiring a total capital outlay of ₹ 40,00,000. You are informed that a debt equity ratio ($D/D+E$) higher than 35%, pushes the K_e up to 12.5%, means reducing the PE ratio to 8 and rises the interest rate on additional amount borrowed to 14%. FIND OUT the probable price of share if:

- the additional funds are raised as a loan.
- the amount is raised by issuing equity shares.

(Note: Retained earnings of the company is ₹ 1.2 crore)

SOLUTION

In this question, EBIT after proposed extension is not given. Therefore, we can assume that existing return on capital employed will be maintained.

Working notes:

$$1. \quad \text{Return on Capital Employed} = \frac{\text{EBIT}}{\text{Capital Employed}} = \frac{\text{₹ } 52,00,000}{\text{₹ } 3,00,00,000} = 17.33\%$$

$$\begin{aligned} \text{Capital Employed} &= \text{Debt} + \text{Equity} \\ &= \text{₹ } 1,00,00,000 + (\text{₹ } 80,00,000 + \text{₹ } 1,20,00,000) \\ &= \text{₹ } 3,00,00,000 \end{aligned}$$

$$\begin{aligned} 2. \quad \text{Proposed EBIT} &= \text{Proposed Capital Employed} \times \text{Return on capital employed} \\ &= (\text{₹ } 3,00,00,000 + \text{₹ } 40,00,000) \times 17.33\% \\ &= \text{₹ } 58,92,200 \end{aligned}$$

(If you take return on capital employed in full digits then accurate EBIT will be ₹ 58,93,333.)

$$3. \quad \text{Debt Equity Ratio} = \frac{\text{Debt}}{\text{Debt} + \text{Equity}}$$

Option1: Loan option

$$\text{Debt} = \text{₹ } 1,00,00,000 + \text{₹ } 40,00,000 = \text{₹ } 1,40,00,000$$

$$\text{Equity} = \text{₹ } 2,00,00,000$$

$$\text{Debt Equity ratio} = \frac{1.4 \text{ cr.}}{1.4 \text{ cr.} + 2 \text{ cr.}} = 41.18\%$$

Debt equity ratio has crossed the limit of 35%, hence, PE ratio in this case will be 8 times and additional borrowing will be at the rate of 14%.

Option2: Equity option

$$\text{Debt} = \text{₹ } 1,00,00,000$$

$$\text{Equity} = \text{₹ } 2,00,00,000 + \text{₹ } 40,00,000 = \text{₹ } 2,40,00,000$$

$$\text{Debt Equity ratio} = \frac{\text{₹ } 1 \text{ cr.}}{\text{₹ } 1 \text{ cr.} + \text{₹ } 2.4 \text{ cr.}} = 29.41\%$$

Debt equity ratio has not crossed the limit of 35% hence PE ratio in this case will remain at 10 times.

4. Number of equity shares to be issued in case of equity option @ ₹ 25 per share = ₹ 40,00,000 / ₹ 25 = 1,60,000

Calculation of EPS and MPS under two financial options

Particulars	Financial Options	
	Option I 14% additional loan of 40,00,000 (₹)	Option II 8,00,000 equity shares @ ₹ 10 i.e 1,60,000 equity shares @ ₹ 25 (₹)
Profit before interest and Tax (PBIT)	58,92,200	58,92,200
Less: Interest on old debentures @ 12%	12,00,000	12,00,000
Less: Interest on additional loan (new) @ 14% on ₹ 40,00,000	5,60,000	Nil
Profit before tax	41,32,200	46,92,000
Less: Taxes @ 50%	20,66,100	23,46,100
Earnings for equity shareholders (EAT/Profit after tax)	20,66,100	23,46,100
Number of Equity Shares	8,00,000	9,60,000
Earnings per Share (EPS)	2.58	2.44
Price/ Earnings ratio	8	10
Market price per share (MPS)	20.66	24.44

Decision: Though loan option has higher EPS but equity option has higher MPS therefore company should raise additional fund through equity option.



6. OVER-CAPITALISATION AND UNDER-CAPITALISATION

6.1 Over-Capitalisation

It is a situation where a firm has more capital than it needs or in other words assets are worth less than its issued share capital, and earnings are insufficient to pay dividend and interest. This situation mainly arises when the existing capital is not effectively utilized on account of fall in earning capacity of the company while company has raised funds more than its requirements. The chief sign of over-capitalisation is the fall in payment of dividend and interest leading to fall in value of the shares of the company.

Causes of Over-Capitalisation: Over-capitalisation arises due to following reasons:

- (i) Raising more money through issue of shares or debentures than company can employ profitably.
- (ii) Borrowing huge amount at higher rate than rate at which company can earn.
- (iii) Excessive payment for the acquisition of fictitious assets such as goodwill etc.
- (iv) Improper provision for depreciation, replacement of assets and distribution of dividends at a higher rate.
- (v) Wrong estimation of earnings and capitalisation.

Consequences of Over-Capitalisation: Over-capitalisation results in the following consequences:

- (i) Considerable reduction in the rate of dividend and interest payments.
- (ii) Reduction in the market price of shares.
- (iii) Resorting to “window dressing”.
- (iv) Some companies may opt for reorganization. However, sometimes the matter gets worse and the company may go into liquidation.

Remedies for Over-Capitalisation: Following steps may be adopted to avoid the negative consequences of over-capitalisation:

- (i) Company should go for thorough reorganization.
- (ii) Buyback of shares.
- (iii) Reduction in claims of debenture-holders and creditors.
- (iv) Value of shares may also be reduced. This will result in sufficient funds for the company to carry out replacement of assets.

6.2 Under-Capitalisation

It is just reverse of over-capitalisation. It is a state, when its actual capitalisation is lower than its proper capitalisation as warranted by its earning capacity. This situation normally happens with companies which have insufficient capital but large secret reserves in the form of considerable appreciation in the values of the fixed assets not brought into the books.

Consequences of Under-Capitalisation: Under-capitalisation results in the following consequences:

- (i) The dividend rate will be higher in comparison to similarly situated companies.
- (ii) Market value of shares will be higher than value of shares of other similar companies because their earning rate being considerably more than the prevailing rate on such securities.
- (iii) Real value of shares will be higher than their book value.

Effects of Under-Capitalisation: Under-capitalisation has the following effects:

- (i) It encourages acute competition. High profitability encourages new entrepreneurs to come into same type of business.
- (ii) High rate of dividend encourages the workers' union to demand high wages.
- (iii) Normally common people (consumers) start feeling that they are being exploited.
- (iv) Management may resort to manipulation of share values.

- (v) Invite more government control and regulation on the company and higher taxation also.

Remedies for Under-Capitalisation: Following steps may be adopted to avoid the negative consequences of under-capitalization:

- (i) The shares of the company should be split up. This will reduce dividend per share, though EPS shall remain unchanged.
- (ii) Issue of Bonus Shares is the most appropriate measure as this will reduce both dividend per share and the average rate of earning.
- (iii) By revising upward the par value of shares in exchange of the existing shares held by them.

6.3 Over-Capitalisation vis-à-vis Under-Capitalisation

From the above discussion it can be said that both over-capitalisation and under-capitalisation are not good. However, over-capitalisation is more dangerous to the company, shareholders and the society than under-capitalisation. The situation of under-capitalisation can be handled more easily than the situation of over-capitalisation. Moreover, under-capitalisation is not an economic problem but a problem of adjusting capital structure. Thus, under-capitalisation should be considered less dangerous but both situations are bad and every company should strive to have a proper capitalisation.

SUMMARY

- ♦ **Capital Structure:** Capital structure refers to the mix of a firm's capitalisation (mix of long term sources of funds such as debentures, preference share capital, equity share capital and retained earnings for meeting total capital requirement). While choosing a suitable financing pattern, certain factors like cost, risk, control, flexibility and other considerations like nature of industry, competition in the industry etc. should be considered.
- ♦ **Capital Structure Theories:** The following approaches explain the relationship between cost of capital, capital structure and value of the firm:
Net income (NI) approach

Net operating income (NOI) approach

Modigliani-Miller (MM) approach

Traditional approach

Trade-off Theory

Pecking Order Theory

- ◆ **Optimal Capital Structure (EBIT-EPS Analysis):** The basic objective of financial management is to design an appropriate capital structure which can provide the highest earnings per share (EPS) over the firm's expected range of earnings before interest and taxes (EBIT). EPS measures a firm's performance for the investors. The level of EBIT varies from year to year and represents the success of a firm's operations. EBIT-EPS analysis is a vital tool for designing the optimal capital structure of a firm. The objective of this analysis is to find the EBIT level that will equate EPS regardless of the financing plan chosen.
- ◆ **Over-capitalisation:** It is a situation where a firm has more capital than it needs or in other words assets are worth less than its issued share capital, and earnings are insufficient to pay dividend and interest.
- ◆ **Under-capitalisation:** It is just reverse of over-capitalisation. It is a state, when its actual capitalization is lower than its proper capitalization as warranted by its earning capacity.

TEST YOUR KNOWLEDGE

Multiple Choice Questions (MCQs)

1. *The assumptions of MM hypothesis of capital structure do not include the following:*
 - (a) *Capital markets are imperfect*
 - (b) *Investors have homogeneous expectations*
 - (c) *All firms can be classified into homogeneous risk classes*
 - (d) *The dividend-payout ratio is cent percent, and there is no corporate tax*

2. *Which of the following is irrelevant for optimal capital structure?*
 - (a) *Flexibility*
 - (b) *Solvency*
 - (c) *Liquidity*
 - (d) *Control*
3. *Financial Structure refers to:*
 - (a) *All financial resources*
 - (b) *Short-term funds*
 - (c) *Long-term funds*
 - (d) *None of these*
4. *An EBIT-EPS indifference analysis chart is used for:*
 - (a) *Evaluating the effects of business risk on EPS*
 - (b) *Examining EPS results for alternative financial plans at varying EBIT levels*
 - (c) *Determining the impact of a change in sales on EBIT*
 - (d) *Showing the changes in EPS quality over time*
5. *The term "capital structure" means:*
 - (a) *Long-term debt, preferred stock, and equity shares*
 - (b) *Current assets and current liabilities*
 - (c) *Net working capital*
 - (d) *Shareholder's equity*
6. *The cost of monitoring management is considered to be a (an):*
 - (a) *Bankruptcy cost*
 - (b) *Transaction cost*
 - (c) *Agency cost*
 - (d) *Institutional cost*

7. *The traditional approach towards the valuation of a firm assumes:*
 - (a) *That the overall capitalization rate changes in financial leverage.*
 - (b) *That there is an optimum capital structure.*
 - (c) *That the total risk is not changed with the changes in the capital structure.*
 - (d) *That the markets are perfect.*
8. *Market values are often used in computing the weighted average cost of capital because:*
 - (a) *This is the simplest way to do the calculation.*
 - (b) *This is consistent with the goal of maximizing shareholder value.*
 - (c) *This is required by SEBI.*
 - (d) *This is a very common mistake.*
9. *A firm's optimal capital structure:*
 - (a) *Is the debt-equity ratio that results in the minimum possible weighted average cost of capital*
 - (b) *40 percent debt and 60 percent equity*
 - (c) *When the debt-equity ratio is 0.50*
 - (d) *When Cost of equity is minimum*
10. *Capital structure of a firm influences the:*
 - (a) *Risk*
 - (b) *Return*
 - (c) *Both Risk and Return*
 - (d) *Return but not Risk*
11. *Consider the below mentioned statements:*
 1. *A company is considered to be over-capitalised when its actual capitalisation is lower than the proper capitalisation as warranted by the earning capacity.*

2. *Both over-capitalisation and under-capitalisation are detrimental to the interests of the society.*

State True or False:

- (a) *1-True, 2-True*
 - (b) *1-False, 2-True*
 - (c) *1-False, 2-False*
 - (d) *1-True, 2-False*
12. *A critical assumption of the Net Operating Income (NOI) approach to valuation is:*
- (a) *That debt and equity levels remain unchanged.*
 - (b) *That dividends increase at a constant rate.*
 - (c) *That k_0 remains constant regardless of changes in leverage.*
 - (d) *That interest expense and taxes are included in the calculation.*
13. *Which of the following steps may be adopted to avoid the negative consequences of over-capitalisation?*
- (a) *The shares of the company should be split up. This will reduce dividend per share, though EPS shall remain unchanged.*
 - (b) *Issue of Bonus Shares.*
 - (c) *Revising upward the par value of shares in exchange of the existing shares held by them.*
 - (d) *Reduction in claims of debenture-holders and creditors.*

Theoretical Questions

1. *DESCRIBE Capital Structure.*
2. *EXPLAIN in brief the assumptions of Modigliani-Miller theory.*
3. *DESCRIBE Net Operating Income (NOI) theory of capital structure? EXPLAIN the assumptions of Net Operating Income approach theory of capital structure.*

4. *EXPLAIN* the principles of "Trading on equity".
5. *DISCUSS* the concept of Debt-Equity or EBIT-EPS indifference point, while determining the capital structure of a company.
6. *DISCUSS* financial break-even and EBIT-EPS indifference analysis.

Practical Problems

1. Aaina Ltd. is considering a new project which requires a capital investment of ₹ 9 crores. Interest on term loan is 12% and Corporate Tax rate is 30%. *CALCULATE* the point of indifference for the project considering the Debt Equity ratio insisted by the financing agencies being 2 : 1.
2. Xylo Ltd. is considering two alternative financing plans as follows:

Particulars	Plan – A (₹)	Plan – B (₹)
Equity shares of ₹ 10 each	8,00,000	8,00,000
Preference Shares of ₹ 100 each	-	4,00,000
12% Debentures	4,00,000	-
	12,00,000	12,00,000

The indifference point between the plans is ₹ 4,80,000. Corporate tax rate is 30%. *CALCULATE* the rate of dividend on preference shares.

3. Ganesha Limited is setting up a project with a capital outlay of ₹ 60,00,000. It has two alternatives in financing the project cost.

Alternative-I: 100% equity finance by issuing equity shares of ₹ 10 each

Alternative-II: Debt-equity ratio 2:1 (issuing equity shares of ₹ 10 each)

The rate of interest payable on the debts is 18% p.a. The corporate tax rate is 40%. *CALCULATE* the indifference point between the two alternative methods of financing.

4. Ganapati Limited is considering three financing plans. The key information is as follows:

(a) Total investment to be raised is ₹ 2,00,000.

(b) *Plans of Financing Proportion:*

Plans	Equity	Debt	Preference Shares
A	100%	-	-
B	50%	50%	-
C	50%	-	50%

(c) *Cost of debt* 8%

Cost of preference shares 8%

(d) *Tax rate* 50%

(e) *Equity shares of the face value of ₹ 10 each will be issued at a premium of ₹ 10 per share.*

(f) *Expected EBIT is ₹ 80,000.*

You are required to DETERMINE for each plan:

(i) *Earnings per share (EPS)*

(ii) *The financial break-even point*

(iii) *Indicate if any of the plans dominate and compute the EBIT range among the plans for indifference.*

5. *Yoyo Limited presently has ₹ 36,00,000 in debt outstanding bearing an interest rate of 10 per cent. It wishes to finance a ₹ 40,00,000 expansion programme and is considering three alternatives: additional debt at 12 per cent interest, preference shares with an 11 per cent dividend, and the issue of equity shares at ₹ 16 per share. The company presently has 8,00,000 shares outstanding and is in a 40 per cent tax bracket.*

(a) *If earnings before interest and taxes are presently ₹ 15,00,000, DETERMINE earnings per share for the three alternatives, assuming no immediate increase in profitability.*

(b) *ANALYSE which alternative do you prefer. COMPUTE how much would EBIT need to increase before the next alternative would be best.*

6. Alpha Limited requires funds amounting to ₹ 80 lakh for its new project. To raise the funds, the company has following two alternatives:
- To issue Equity Shares of ₹ 100 each (at par) amounting to ₹ 60 lakh and borrow the balance amount at the interest of 12% p.a., or
 - To issue Equity Shares of ₹ 100 each (at par) and 12% Debentures in equal proportion.

The Income-tax rate is 30%.

IDENTIFY the point of indifference between the available two modes of financing and state which option will be beneficial in different situations.

7. One-third of the total market value of Sanghmani Limited consists of loan stock, which has a cost of 10 per cent. Another company, Samsui Limited, is identical in every respect to Sanghmani Limited, except that its capital structure is all-equity, and its cost of equity is 16 per cent. According to Modigliani and Miller, if we ignored taxation and tax relief on debt capital, COMPUTE the cost of equity of Sanghmani Limited?
8. The following data relates to two companies belonging to the same risk class:

Particulars	A Ltd.	B Ltd.
Expected Net Operating Income	₹ 18,00,000	₹ 18,00,000
12% Debt	₹ 54,00,000	-
Equity Capitalization Rate	-	18

REQUIRED:

- Determine the total market value, Equity capitalization rate and weighted average cost of capital for each company assuming no taxes as per M.M. Approach.
 - Determine the total market value, Equity capitalization rate and weighted average cost of capital for each company assuming 40% taxes as per M.M. Approach.
9. Leo Ltd. has a net operating income of ₹ 21,60,000 and the total capitalisation of ₹ 120 lakhs. The company is evaluating the options to introduce debt financing in the capital structure and the following information is available at various levels of debt value.

Debt value (₹)	Interest rate (%)	Equity Capitalisation rate (%)
0	N.A.	12.00
10,00,000	7.00	12.50
20,00,000	7.00	13.00
30,00,000	7.50	13.50
40,00,000	7.50	14.00
50,00,000	8.00	15.00
60,00,000	8.50	16.00
70,00,000	9.00	17.00
80,00,000	10.00	20.00

You are required to COMPUTE the equity capitalization rate if MM approach is followed. Assume that the firm operates in zero tax regime and calculations to be based on book values.

10. Axar Ltd. has a Sales of ₹ 68,00,000 with a Variable cost Ratio of 60%.

The company has fixed cost of ₹16,32,000. The capital of the company comprises of 12% long term debt, ₹ 1,00,000 Preference Shares of ₹ 10 each carrying dividend rate of 10% and 1,50,000 equity shares.

The tax rate applicable for the company is 30%.

At current sales level, DETERMINE the Interest, EPS and amount of debt for the firm if a 25% decline in Sales will wipe out all the EPS.

11. The financial advisor of Sun Ltd. is confronted with following two alternative financing plans for raising ₹ 10 lakhs that is needed for plant expansion and modernization

Alternative I: Issue 80% of funds with 14% Debenture [Face value (FV) ₹ 100] at par and redeem at a premium of 10% after 10 years and balance by issuing equity shares at $33\frac{1}{3}$ % premium.

Alternative II: Raise 10% of funds required by issuing 8% Irredeemable Debentures [Face value (FV) ₹ 100] at par and the remaining by issuing equity shares at current market price of ₹125.

Currently, the firm has an Earnings per share (EPS) of ₹ 21

The modernization and expansion programme is expected to increase the firm's Earnings before Interest and Taxation (EBIT) by ₹ 200,000 annually.

The firm's condensed Balance Sheet for the current year is given below:

Balance Sheet as on 31.3.2022

Liabilities	(₹)	Assets	(₹)
Current Liabilities	5,00,000	Current Assets	16,00,000
10% Long Term Loan	15,00,000	Plant & Equipment (Net)	34,00,000
Reserves & Surplus	10,00,000		
Equity Share Capital (FV: ₹ 100 each)	20,00,000		
TOTAL	50,00,000	TOTAL	50,00,000

However, the finance advisor is concerned about the effect that issuing of debt might have on the firm. The average debt ratio for firms in industry is 35%. He believes if this ratio is exceeded, the P/E ratio of the company will be 7 because of the potentially greater risk.

If the firm increases its equity capital by more than 10 %, he expects the P/E ratio of the company will increase to 8.5 irrespective of the debt ratio.

Assume Tax Rate of 25%. Assume target dividend pay-out under each alternative to be 60% and growth rate to be 10% for the purpose of calculating Cost of Equity.

SUGGEST with reason which alternative is better on the basis of each of the below given criteria:

- I. Earnings per share (EPS) & Market Price per share (MPS)
- II. Financial Leverage
- III. Weighted Average Cost of Capital & Marginal Cost of Capital (using Book Value weights)

Case Scenarios

1. *XYZ Industries Ltd., a renowned player in the manufacturing sector, has been contemplating an ambitious expansion program. To finance this growth, the company scrutinizes its current capital structure, which is a blend of equity, retained earnings, preference shares, and debentures.*

The equity base of XYZ Industries Ltd., is robust with 40,000 equity shares valued at ₹ 100 each, amounting to a substantial ₹ 40,00,000. This equity foundation is bolstered by retained earnings of ₹ 10,00,000, reflecting the company's prudent profit reinvestment strategy.

In addition to equity, XYZ Industries Ltd., has diversified its financing through 9% preference shares and 7% debentures, each contributing ₹ 25,00,000 to the capital pool. This strategic mix of debt and equity showcases the company's balanced approach to leveraging and risk management.

The company's capital yields a healthy return rate of 12% on capital employed, indicative of its operational efficiency and market competitiveness. However, it operates in a high-tax environment with an income-tax rate of 50%, which significantly impacts its net earnings and available reinvestment capital.

Faced with the need to raise an additional ₹ 25,00,000 for its expansion program, XYZ Industries Ltd., stands at a crossroads. The decision to fund this venture will require careful consideration of the cost of capital, tax implications, and the impact on shareholder value.

The management must evaluate whether to issue more equity shares, preference shares or debentures. Issuing equity could dilute current shareholders' value but would not increase the company's debt burden. Preference shares offer a fixed return to investors and have priority over equity in profit distribution but come at a higher cost than debt. Debentures are less expensive due to tax-deductible interest expenses but increase financial risk. XYZ Industries Ltd.'s journey towards expansion is not just about raising funds but also about maintaining a delicate balance between growth aspirations and financial stability. The company's choice will set a precedent for its future financial strategies and market reputation.

Faced with the challenge of capital structure decision making to finance the expansion programme the finance manager is considering the following alternatives:

- (i) Issue of 20,000 equity shares at a premium of ₹ 25 per share.
- (ii) Issue of 10% preference shares.
- (iii) Issue of 8% debentures

The manufacturing company has estimated that the PE ratios in the cases of equity preference and debenture financing would be 20, 17 and 16 respectively. You are required to evaluate the various financial alternatives considering three plans proposed i.e. Plan I (Equity), Plan II (Preference Shares) and Plan III (Debentures).

Based on the information provided above you are required to answer the following MCQ's:

- i. What will be the amount of PAT under the three plans i.e. Plan I (Equity), Plan II (Preference Shares) and Plan III (Debentures) respectively from the following?
 - (a) ₹ 13,25,000, ₹ 13,25,000 and ₹ 11,25,000
 - (b) ₹ 8,62,500, ₹ 9,62,500 and ₹ 10,62,500
 - (c) ₹ 15,00,000, ₹ 15,00,000 and ₹ 15,00,000
 - (d) ₹ 6,62,500, ₹ 6,62,500 and ₹ 5,62,500
- ii. What will be the amount of total preference dividend under the three plans i.e. Plan I (Equity), Plan II (Preference Shares) and Plan III (Debentures) respectively from the following?
 - (a) ₹ 3,25,000, ₹ 3,25,000 and ₹ 5,25,000
 - (b) ₹ 8,62,500, ₹ 9,62,500 and ₹ 10,62,500
 - (c) ₹ 2,25,000, ₹ 4,75,000 and ₹ 2,25,000
 - (d) ₹ 2,25,000, ₹ 2,25,000 and ₹ 2,25,000
- iii. What will be the amount of earnings available for equity shareholders under the three plans i.e. Plan I (Equity), Plan II (Preference Shares) and Plan III (Debentures) respectively from the following?
 - (a) ₹ 3,47,500, ₹ 5,77,500 and ₹ 3,98,000
 - (b) ₹ 9,37,500, ₹ 8,87,500 and ₹ 7,37,500
 - (c) ₹ 4,37,500, ₹ 1,87,500 and ₹ 3,37,500
 - (d) ₹ 5,37,500, ₹ 2,87,500 and ₹ 4,37,500

- iv. What will be the EPS under the three plans i.e. Plan I (Equity), Plan II (Preference Shares) and Plan III (Debentures) respectively from the following?
- (a) 4.44, 7.66 and 7.29
 (b) 7.00, 6.88 and 7.29
 (c) 7.29, 4.69 and 8.44
 (d) 8.44, 9.88 and 6.78
- v. What will be the market price per share under the three plans i.e. Plan I (Equity), Plan II (Preference Shares) and Plan III (Debentures) respectively from the following?
- (a) 134.50, 123.45 and 78.98
 (b) 145.80, 79.73 and 135.04
 (c) 148.8, 187.96 and 118.48
 (d) 168.8, 167.96 and 108.48

ANSWERS/SOLUTION

Answers to the MCQs

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

Answers to the Theoretical Questions

1. Please refer paragraph 1
2. Please refer paragraph 2.4
3. Please refer paragraph 2.3
4. Please refer paragraph 3.2
5. Please refer paragraph 5
6. Please refer paragraph 5.2

Answers to the Practical Problems

1. The capital investment can be financed in two ways i.e.

- (i) By issuing equity shares only worth ₹ 9 crore or
- (ii) By raising capital through taking a term loan of ₹ 6 crores and ₹ 3 crores through issuing equity shares (as the company has to comply with the 2 : 1 Debt Equity ratio insisted by financing agencies).

In first option interest will be Zero and in second option the interest will be ₹ 72,00,000

Point of Indifference between the above two alternatives =

$$\frac{\text{EBIT} \times (1-t)}{\text{No. of equity shares (N}_1\text{)}} = \frac{(\text{EBIT} - \text{Interest}) \times (1-t)}{\text{No. of equity shares (N}_2\text{)}}$$

$$\text{Or, } \frac{\text{EBIT} (1-0.30)}{90,00,000 \text{ shares}} = \frac{(\text{EBIT} - ₹ 72,00,000) \times (1-0.30)}{30,00,000 \text{ shares}}$$

$$\begin{aligned} \text{Or, } 0.7 \text{ EBIT} &= 2.1 \text{ EBIT} - ₹ 1,51,20,000 \\ \text{EBIT} &= ₹ 1,08,00,000 \end{aligned}$$

EBIT at point of Indifference will be ₹ 1.08 crore.

(The face value of the equity shares is assumed as ₹ 10 per share. However, indifference point will be same irrespective of face value per share).

2. Computation of Rate of Preference Dividend

$$\begin{aligned} \frac{(\text{EBIT} - \text{Interest}) (1-t)}{\text{No. of Equity Shares (N}_1\text{)}} &= \frac{\text{EBIT} (1-t) - \text{Preference Dividend}}{\text{No. of Equity Shares (N}_2\text{)}} \\ \frac{(₹ 4,80,000 - ₹ 48,000) \times (1-0.30)}{80,00,000 \text{ shares}} &= \frac{₹ 4,80,000 (1-0.30) - \text{Preference Dividend}}{80,00,000 \text{ shares}} \\ \frac{₹ 3,02,400}{80,00,000 \text{ shares}} &= \frac{₹ 3,36,000 - \text{Preference Dividend}}{80,00,000 \text{ shares}} \\ ₹ 3,02,400 &= ₹ 3,36,000 - \text{Preference Dividend} \\ \text{Preference Dividend} &= ₹ 3,36,000 - ₹ 3,02,400 = ₹ 33,600 \\ \text{Rate of Dividend} &= \frac{\text{Preference Dividend}}{\text{Preference share capital}} \times 100 \end{aligned}$$

$$= \frac{₹ 33,600}{4,00,000} \times 100 = 8.4\%$$

3. Calculation of Indifference point between the two alternatives of financing

Alternative-I By issue of 6,00,000 equity shares of ₹ 10 each amounting to ₹ 60 lakhs. No financial charges are involved.

Alternative-II By raising the funds in the following way:

Debt = ₹ 40 lakhs

Equity = ₹ 20 lakhs (2,00,000 equity shares of ₹ 10 each)

$$\text{Interest payable on debt} = 40,00,000 \times \frac{18}{100} = ₹ 7,20,000$$

The difference point between the two alternatives is calculated by:

$$\frac{(\text{EBIT} - I_1)(1 - T)}{E_1} = \frac{(\text{EBIT} - I_2)(1 - T)}{E_2}$$

Where,

EBIT = Earnings before interest and taxes

I_1 = Interest charges in Alternative-I

I_2 = Interest charges in Alternative-II

T = Tax rate

E_1 = Equity shares in Alternative-I

E_2 = Equity shares in Alternative-II

Putting the values, the break-even point would be as follows:

$$\frac{(\text{EBIT} - 0)(1 - 0.40)}{6,00,000} = \frac{(\text{EBIT} - 7,20,000)(1 - 0.40)}{2,00,000}$$

$$\frac{(\text{EBIT})(0.60)}{6,00,000} = \frac{(\text{EBIT} - 7,20,000)(0.60)}{2,00,000}$$

$$\frac{\text{EBIT}(0.60)}{3} = \frac{0.60(\text{EBIT} - 7,20,000)}{1}$$

$$\text{EBIT} = 3\text{EBIT} - 21,60,000$$

$$- 2 \text{ EBIT} = -21,60,000$$

$$\text{EBIT} = \frac{21,60,000}{2}$$

$$\text{EBIT} = ₹ 10,80,000$$

Therefore, at EBIT of ₹ 10,80,000 earnings per share for the two alternatives is equal.

4. (i) Computation of Earnings per share (EPS)

Plans	A (₹)	B (₹)	C (₹)
Earnings before interest and tax (EBIT)	80,000	80,000	80,000
Less: Interest charges	---	(8,000) (8% × ₹1 lakh)	---
Earnings before tax (EBT)	80,000	72,000	80,000
Less: Tax (@ 50%)	(40,000)	(36,000)	(40,000)
Earnings after tax (EAT)	40,000	36,000	40,000
Less: Preference dividend	---	---	(8,000) (8% × ₹1 lakh)
Earnings available for Equity shareholders (A)	40,000	36,000	32,000
No. of Equity shares (B)	10,000 (₹2 lakh ÷ ₹20)	5,000 (₹1 lakh ÷ ₹20)	5,000 (₹1 lakh ÷ ₹20)
EPS [(A) ÷ (B)]	4	7.20	6.40

(ii) Calculation of Financial Break-even point

$$\text{Financial break-even point} = \text{Interest} + \text{Preference Dividend}/(1-t)$$

Plan A: Under this plan there is no interest or preference dividend payment hence, the Financial Break-even point will be zero.

Plan B: Under this plan there is an interest payment of ₹ 8,000 and no preference dividend, hence, the Financial Break-even point will be ₹ 8,000 (Interest charges).

Plan C: Under this plan there is no interest payment but an after tax preference dividend of ₹ 8,000 is paid. Hence, the Financial Break- even point will be before tax earnings of ₹ 16,000 (i.e. ₹ 8,000 ÷ (1 - 0.5) = ₹ 16,000)

(iii) Computation of indifference point between the plans

The indifference between two alternative methods of financing is calculated by applying the following formula:

$$\frac{(EBIT - I_1)(1 - T)}{E_1} = \frac{(EBIT - I_2)(1 - T)}{E_2}$$

I. Indifference point where EBIT of Plan A and Plan B is equal.

$$\frac{(EBIT - 0)(1 - 0.5)}{10,000} = \frac{(EBIT - 8,000)(1 - 0.5)}{5,000}$$

$$0.5 \text{ EBIT (5,000)} = (0.5 \text{ EBIT} - 4,000) (10,000)$$

$$0.5 \text{ EBIT} = \text{EBIT} - 8,000$$

$$0.5 \text{ EBIT} = 8,000$$

$$\text{EBIT} = ₹ 16,000$$

II. Indifference point where EBIT of Plan A and Plan C is equal.

$$\frac{(EBIT - 0)(1 - 0.5)}{10,000} = \frac{(EBIT - 0)(1 - 0.5) - 8,000}{5,000}$$

$$\frac{0.5 \text{ EBIT}}{10,000} = \frac{0.5 \text{ EBIT} - 8,000}{5,000}$$

$$0.25 \text{ EBIT} = 0.5 \text{ EBIT} - 8,000$$

$$0.25 \text{ EBIT} = 8,000$$

$$\text{EBIT} = ₹ 32,000$$

III. Indifference point where EBIT of Plan B and Plan C are equal.

$$\frac{(\text{EBIT} - ₹8,000)(1 - 0.5)}{5,000} = \frac{(\text{EBIT} - 0)(1 - 0.5) - ₹8,000}{5,000}$$

$$0.5 \text{ EBIT} - 4,000 = 0.5 \text{ EBIT} - ₹ 8,000$$

There is no indifference point between the financial plan B and C.

It can be seen that Financial Plan B dominates Plan C. Since, the financial break-even point of the former is only ₹ 8,000 but in case of latter it is ₹ 16,000. Further EPS of plan B is the highest.

5. (a)

Particulars	Alternatives		
	Alternative-I: Take additional Debt	Alternative-II: Issue 11% Preference Shares	Alternative-III: Issue further Equity Shares
	₹	₹	₹
EBIT	15,00,000	15,00,000	15,00,000
Interest on Debts:			
- on existing debt @10%	(3,60,000)	(3,60,000)	(3,60,000)
- on new debt @ 12%	(4,80,000)	---	---
Profit before taxes	6,60,000	11,40,000	11,40,000
Taxes @ 40%	(2,64,000)	(4,56,000)	(4,56,000)
Profit after taxes	3,96,000	6,84,000	6,84,000
Preference shares dividend	---	(4,40,000)	---
Earnings available to equity Shareholders	3,96,000	2,44,000	6,84,000
Number of shares	8,00,000	8,00,000	10,50,000
Earnings per share	0.495	0.305	0.651

- (b) For the present EBIT level, equity shares are clearly preferable. EBIT would need to increase by ₹ 2,376 – ₹ 1,500 = ₹ 876 before an indifference point with debt is reached. One would want to be comfortably above this indifference point before a strong case for debt should be made. The lower the probability that actual EBIT will fall below the indifference point, the stronger the case that can be made for debt, all other things remain the same.

Working Note:

Calculation of indifference point between debt and equity shares (in thousands)-

$$\frac{\text{EBIT} - ₹ 840}{800} = \frac{\text{EBIT} - ₹ 360}{1,050}$$

$$\text{EBIT} (1,050) - ₹ 840(1,050) = \text{EBIT} (800) - ₹ 360 (800)$$

$$250\text{EBIT} = ₹ 5,94,000$$

$$\text{EBIT} = ₹ 2,376$$

6. (i) Amount = ₹ 80,00,000

Plan I = Equity of ₹ 60,00,000 + Debt of ₹ 20,00,000

Plan II = Equity of ₹ 40,00,000 + 12% Debentures of ₹ 40,00,000

Plan I: Interest Payable on Loan

$$= 12\% \times ₹ 20,00,000 = ₹ 2,40,000$$

Plan II: Interest Payable on Debentures

$$= 12\% \times ₹ 40,00,000 = ₹ 4,80,000$$

Computation of Point of Indifference

$$\frac{(\text{EBIT} - I_1)(1-t)}{E_1} = \frac{(\text{EBIT} - I_2)(1-t)}{E_2}$$

$$\frac{(\text{EBIT} - ₹ 2,40,000)(1-0.3)}{60,000} = \frac{(\text{EBIT} - ₹ 4,80,000)(1-0.3)}{40,000}$$

$$2 (\text{EBIT} - ₹ 2,40,000) = 3 (\text{EBIT} - ₹ 4,80,000)$$

$$\begin{aligned}
 2 \text{ EBIT} - ₹ 4,80,000 &= 3 \text{ EBIT} - ₹ 14,40,000 \\
 2 \text{ EBIT} - 3 \text{ EBIT} &= - ₹ 14,40,000 + ₹ 4,80,000 \\
 \text{EBIT} &= ₹ 9,60,000
 \end{aligned}$$

(ii) **Earnings per share (EPS) under Two Situations for both the Plans**

Situation A (EBIT is assumed to be ₹ 9,50,000)		
Particulars	Plan I ₹	Plan II ₹
EBIT	9,50,000	9,50,000
Less: Interest @ 12%	(2,40,000)	(4,80,000)
EBT	7,10,000	4,70,000
Less: Taxes @ 30%	(2,13,000)	(1,41,000)
EAT	4,97,000	3,29,000
No. of Equity Shares	60,000	40,000
EPS	8.28	8.23

Comment: In Situation A, when expected EBIT is less than the EBIT at indifference point then, Plan I is more viable as it has higher EPS. The advantage of EPS would be available from the use of equity capital and not debt capital.

Situation B (EBIT is assumed to be ₹ 9,70,000)		
Particulars	Plan I ₹	Plan II ₹
EBIT	9,70,000	9,70,000
Less: Interest @ 12%	(2,40,000)	(4,80,000)
EBT	7,30,000	4,90,000
Less: Taxes @ 30%	(2,19,000)	(1,47,000)
EAT	5,11,000	3,43,000
No. of Equity Shares	60,000	40,000
EPS	8.52	8.58

Comment: In Situation B, when expected EBIT is more than the EBIT at indifference point then, Plan II is more viable as it has higher EPS. The use of fixed-cost source of funds would be beneficial from the EPS viewpoint. In this case, financial leverage would be favourable.

(Note: The problem can also be worked out assuming any other figure of EBIT which is more than ₹ 9,60,000 and any other figure less than ₹ 9,60,000. Alternatively, the answer may also be based on the factors/governing the capital structure like the cost, risk, control, etc. Principles).

7. Here we are assuming that MM Approach 1958: Without tax, where capital structure has no relevance with the value of company and accordingly overall cost of capital of both levered as well as unlevered company is same. Therefore, the two companies should have similar WACCs. Because Samsui Limited is all-equity financed, its WACC is the same as its cost of equity finance, i.e. 16 per cent. It follows that Sanghmani Limited should have WACC equal to 16 per cent also.

Therefore, Cost of equity in Sanghmani Ltd. (levered company) will be calculated as follows:

$$K_o = \frac{2}{3} \times K_e + \frac{1}{3} \times K_d = 16\% \text{ (i.e. equal to WACC of Samsui Ltd.)}$$

$$\text{Or, } 16\% = \frac{2}{3} \times K_e + \frac{1}{3} \times 10\% \quad \text{Or, } K_e = 19$$

8. (a) Assuming no tax as per MM Approach.

Calculation of Value of Firms 'A Ltd.' and 'B Ltd' according to MM Hypothesis

Market Value of 'B Ltd' [Unlevered(u)]

Total Value of Unlevered Firm (V_u) = $[NOI/k_e] = 18,00,000/0.18 = ₹ 1,00,00,000$

K_e of Unlevered Firm (given) = 0.18

K_o of Unlevered Firm (Same as above = k_e as there is no debt) = 0.18

Market Value of 'A Ltd' [Levered Firm (l)]

Total Value of Levered Firm (V_L) = $V_u + (\text{Debt} \times \text{Nil})$

$$= ₹ 1,00,00,000 + (54,00,000 \times \text{nil})$$

$$= ₹ 1,00,00,000$$

**Computation of Equity Capitalization Rate and
Weighted Average Cost of Capital (WACC)**

	Particulars	A Ltd.	B Ltd.
A.	Net Operating Income (NOI)	₹ 18,00,000	₹ 18,00,000
B.	Less: Interest on Debt (I)	₹ 6,48,000	-
C.	Earnings of Equity Shareholders (NI)	₹ 11,52,000	₹ 18,00,000
D.	Overall Capitalization Rate (k_o)	0.18	0.18
E.	Total Value of Firm ($V = \text{NOI}/k_o$)	₹ 1,00,00,000	₹ 1,00,00,000
F.	Less: Market Value of Debt	₹ 54,00,000	-
G.	Market Value of Equity (S)	₹ 46,00,000	₹ 1,00,00,000
H.	Equity Capitalization Rate [$k_e = \text{NI} / S$]	0.2504	0.18
I.	Weighted Average Cost of Capital [WACC (k_o)] $k_o = (k_e \times S/V) + (k_d \times D/V)$	0.18	0.18

*Computation of WACC A Ltd

Component of Capital	Amount	Weight	Cost of Capital	WACC
Equity	₹ 46,00,000	0.46	0.2504	0.1152
Debt	₹ 54,00,000	0.54	0.12*	0.0648
Total	₹ 1,00,00,000			0.18

* $K_d = 12\%$ (since there is no tax)

WACC = 18%

(b) Assuming 40% taxes as per MM Approach

Calculation of Value of Firms 'A Ltd.' and 'B Ltd' according to MM Hypothesis

Market Value of 'B Ltd' [Unlevered(u)]

$$\begin{aligned}\text{Total Value of unlevered Firm } (V_u) &= [\text{NOI} (1 - t)/k_e] = 18,00,000 (1 - 0.40) / 0.18 \\ &= ₹ 60,00,000\end{aligned}$$

K_e of unlevered Firm (given) = 0.18

K_o of unlevered Firm (Same as above = k_e as there is no debt) = 0.18

Market Value of 'A Ltd' [Levered Firm (I)]

$$\begin{aligned}\text{Total Value of Levered Firm } (V_L) &= V_u + (\text{Debt} \times \text{Tax}) \\ &= ₹ 60,00,000 + (₹ 54,00,000 \times 0.4) \\ &= ₹ 81,60,000\end{aligned}$$

Computation of Weighted Average Cost of Capital (WACC) of 'B Ltd.'

$$= 18\% \text{ (i.e. } K_e = K_o \text{)}$$

Computation of Equity Capitalization Rate and Weighted Average Cost of Capital (WACC) of A Ltd

Particulars	A Ltd. (₹)
Net Operating Income (NOI)	18,00,000
Less: Interest on Debt (I)	6,48,000
Earnings Before Tax (EBT)	11,52,000
Less: Tax @ 40%	4,60,800
Earnings for equity shareholders (NI)	6,91,200
Total Value of Firm (V) as calculated above	81,60,000
Less: Market Value of Debt	54,00,000
Market Value of Equity (S)	27,60,000
Equity Capitalization Rate [$k_e = \text{NI}/S$]	0.2504
Weighted Average Cost of Capital (k_o)* $k_o = (k_e \times S/V) + (k_d \times D/V)$	13.23

*Computation of WACC A Ltd

Component of Capital	₹	Weight	Cost of Capital	WACC
Equity	27,60,000	0.338	0.2504	0.0846
Debt	54,00,000	0.662	0.072*	0.0477
Total	81,60,000			0.1323

$$*K_d = 12\% (1 - 0.4) = 12\% \times 0.6 = 7.2\%$$

$$WACC = 13.23\%$$

9. As per MM approach, cost of the capital (K_0) remains constant, and cost of equity increases linearly with debt.

$$\text{Value of a Firm} = \frac{\text{NOI}}{K_0}$$

$$\therefore 1,20,00,000 = \frac{21,60,000}{K_0}$$

$$\therefore K_0 = \frac{21,60,000}{1,20,00,000} = 18\%$$

$$\text{Under MM approach, } k_e = k_0 + \frac{D}{E}(k_0 - k_d)$$

Statement of equity capitalization under MM approach

Debt Value (₹)	Equity Value (₹)	Debt/Equity	K_d (%)	K_0 (%)	$K_0 - k_d$ (%)	$K_e = K_0 + (K_0 - K_d)(D/E)$ (%)
-	1,20,00,000	0.0000	NA	18.00	18.00	18.00
10,00,000	1,10,00,000	0.0909	7.00	18.00	11.00	19.00
20,00,000	1,00,00,000	0.2000	7.00	18.00	11.00	20.20
30,00,000	90,00,000	0.3333	7.50	18.00	10.50	21.50
40,00,000	80,00,000	0.5000	7.50	18.00	10.50	23.25
50,00,000	70,00,000	0.7143	8.00	18.00	10.00	25.14
60,00,000	60,00,000	1.0000	8.50	18.00	9.50	27.50
70,00,000	50,00,000	1.4000	9.00	18.00	9.00	30.60
80,00,000	40,00,000	2.0000	10.00	18.00	8.00	34.00

10. Break Even Sales = ₹ 68,00,000 × 0.75 = ₹ 51,00,000

Income Statement

	Original ₹	Calculation of Interest at BEP (backward calculation) ₹	Now at present level ₹
Sales	68,00,000	51,00,000	68,00,000
Less: Variable Cost	40,80,000	30,60,000	40,80,000
Contribution	27,20,000	20,40,000	27,20,000
Less: Fixed Cost	16,32,000	16,32,000	16,32,000
EBIT	10,88,000	4,08,000	10,88,000
Less: Interest (EBIT-PBT)	?	3,93,714	3,93,714
PBT	?	14,286(10,000/70%)	6,94,286
Less: Tax @ 30% (or PBT-PAT)	?	4,286	2,08,286
PAT	?	10,000(Nil+10,000)	4,86,000
Less: Preference Dividend	10,000	10,000	10,000
Earnings for Equity share holders	?	Nil (at BEP)	4,76,000
Number of Equity Shares	1,50,000	1,50,000	1,50,000
EPS	?	-	3.1733

So Interest = ₹ 3,93,714, EPS = ₹ 3.1733, Amount of debt = 3,93,714/12% = ₹ 32,80,950

11. Calculation of Equity Share capital and Reserves and surplus:

Alternative 1:

$$\text{Equity Share capital} = ₹ 20,00,000 + \frac{₹ 2,00,000 \times 100}{133.3333} = ₹ 21,50,000$$

$$\text{Reserves} = ₹ 10,00,000 + \frac{₹ 2,00,000 \times 33.3333}{133.3333} = ₹ 10,50,000$$

Alternative 2:

$$\text{Equity Share capital} = ₹ 20,00,000 + \frac{₹ 9,00,000 \times 100}{125} = ₹ 27,20,000$$

$$\text{Reserves} = ₹ 10,00,000 + \frac{₹ 9,00,000 \times 25}{125} = ₹ 11,80,000$$

Capital Structure Plans

(Amount in ₹)

Capital	Alternative 1 ₹	Alternative 2 ₹
Equity Share capital	21,50,000	27,20,000
Reserves and surplus	10,50,000	11,80,000
10% long term debt	15,00,000	15,00,000
14% Debentures	8,00,000	-
8% Irredeemable Debentures	-	1,00,000
Total Capital Employed	55,00,000	55,00,000

Computation of Present Earnings before interest and tax (EBIT)

EPS (₹)	21
No. of equity shares	20,000
Earnings for equity shareholders (I x II) (₹)	4,20,000
Profit Before Tax (III/75%) (₹)	5,60,000
Interest on long term loan (1500000 x 10%) (₹)	1,50,000
EBIT (IV + V) (₹)	7,10,000

$$\text{EBIT after expansion} = ₹ 7,10,000 + ₹ 2,00,000 = ₹ 9,10,000$$

Evaluation of Financial Plans on the basis of EPS, MPS and Financial Leverage

(Amount in ₹)

Particulars	Alternative I	Alternate II
EBIT	9,10,000	9,10,000
Less: Interest: 10% on long term loan	(1,50,000)	(1,50,000)

14% on Debentures	(1,12,000)	Nil
8% on Irredeemable Debentures	Nil.	(8000)
PBT	6,48,000	7,52,000
Less: Tax @25%	(1,62,000)	(1,88,000)
PAT	4,86,000	5,64,000
No. of equity shares	21,500	27,200
EPS	22.60	20.74
Applicable P/E ratio (Working Note 1)	7	8.5
MPS (EPS X P/E ratio)	158.2	176.29
Financial Leverage EBIT/PBT	1.40	1.21

Working Note 1

	Alternative I	Alternative II
Debt:		
₹15,00,000 + ₹8,00,000	23,00,000	-
₹15,00,000 + ₹1,00,000	-	16,00,000
Total capital Employed (₹)	55,00,000	55,00,000
Debt Ratio (Debt/Capital employed)	=0.4182	=0.2909
	=41.82%	=29.09%
Change in Equity: ₹21,50,000-₹20,00,000 ₹27,20,000-₹20,00,000	1,50,000	7,20,000
Percentage change in equity	7.5%	36%
Applicable P/E ratio	7	8.5

Calculation of Cost of equity and various type of debt

	Alternative I	Alternative II
A) Cost of equity		
EPS ₹	22.60	20.74
DPS (EPS X 60%) ₹	13.56	12.44
Growth (g)	10%	10%

Po (MPS)	158.2	176.29
$K_e = \frac{D_o(1+g)}{P_o} + g$	$\frac{13.56(1.1)}{158.2} + 10\%$	$\frac{12.44(1.1)}{176.29} + 10\%$
	=19.43%	=17.76%
B) Cost of Debt:		
10% long term debt	10% + (1-0.25)	10% + (1-0.25)
	= 7.5%	= 7.5%
14% redeemable debentures	$\frac{14(1-0.25) + (110-100/10)}{110+100/2}$	nil
	= 10.5 + 1 / 10.5	
	= 10.95%	
8% irredeemable debenture	NA	8000 (1-0.25)/1,00,00 = 6%

Calculation of Weighted Average cost of capital (WACC)

Capital	Alternative 1			Alternative 2		
	Weights	Cost (%)	WACC	Weights	Cost (%)	WACC
Equity Share Capital	0.3909	19.43	7.60%	0.4945	17.76	8.78%
Reserves and Surplus	0.1909	19.43	3.71%	0.2145	17.76	3.81%
10% Long term Debt	0.2727	7.50	2.05%	0.2727	7.50	2.05%
14% Debenture	0.1455	10.95	1.59%			
8% Irredeemable Debentures	-			0.0182	6	0.11%
			14.94%			14.75%

Calculation Marginal Cost of Capital (MACC)

Capital	Alternative 1			Alternative 2		
	(weight)	Cost (%)	MACC	(weight)	Cost (%)	MACC
Equity Share Capital	₹ 1,50,000 (0.15)	19.43	2.91%	₹ 7,20,000 (0.72)	17.76	12.79%
Reserves and Surplus	₹ 50,000 (0.05)	19.43	0.97%	₹ 1,80,000 (0.18)	17.76	3.20%
14% Debenture	₹ 8,00,000 (0.80)	10.95	8.76%	-		0.00%
8% Irredeemable Debentures	-			₹ 1,00,000 (0.10)	6	0.60%
Total Capital Employed	₹ 10,00,000		12.64%	₹ 10,00,000		16.59%

Summary of solution:

	Alternate I	Alternate II
Earning per share (EPS) ₹	22.60	20.74
Market price per share (MPS) ₹	158.20	176.29
Financial leverage	1.4043	1.2101
Weighted Average cost of capital (WACC)	14.94%	14.75%
Marginal cost of capital (MACC)	12.64%	16.59%

Alternative 1 of financing will be preferred under the criteria of EPS and marginal cost of capital, whereas Alternative II of financing will be preferred under the criteria of MPS, Financial leverage and WACC.

Answers to the Case Scenarios

1.

i.	(d)	ii.	(c)	iii.	(c)	iv.	(c)	v.	(b)
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Evaluation of various financial alternatives	Plan I (Equity) (₹)	Plan II (Preference Shares) (₹)	Plan III (Debentures) (₹)
1. EBIT**	15,00,000	15,00,000	15,00,000
2. Interest:			
Existing	1,75,000	1,75,000	1,75,000
Additional	-	-	2,00,000
Total Interest	1,75,000	1,75,000	3,75,000
3. PBT (1-2)	13,25,000	13,25,000	11,25,000
4. TAX 50%	6,62,500	6,62,500	5,62,500
5. PAT (3-4)	6,62,500	6,62,500	5,62,500
6. Preference dividend			
Existing	2,25,000	2,25,000	2,25,000
Additional	-	2,50,000	-
Total Preference Dividend	2,25,000	4,75,000	2,25,000
7. Equity earnings (5-6)	4,37,500	1,87,500	3,37,500
8. No. of equity shares	*60,000	40,000	40,000
9. EPS [7/8]	7.29	4.69	8.44
10. P/E Ratio (Given)	20	17	16
11. Market Price per share	145.80	79.73	135.04

*40,000 + 20,000 new shares = 60,000 shares

**EBIT = 12% of (100 lakhs existing + new 25 lakhs) = ₹ 15,00,000

FINANCING DECISIONS- LEVERAGES

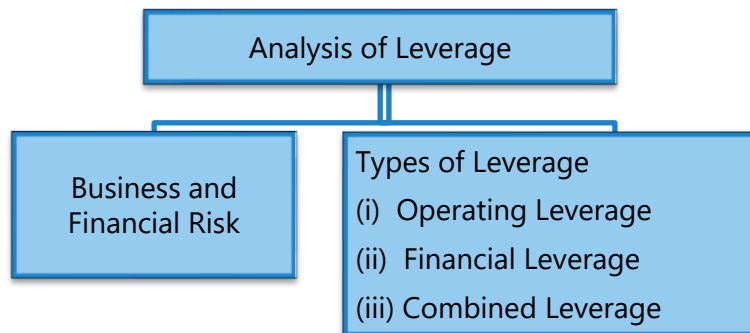


LEARNING OUTCOMES

After studying this chapter, you would be able to -

- ◆ Understand the concept of business risk and financial risk.
- ◆ Discuss and interpret the types of leverages.
- ◆ Discuss the relationship between operating leverage, Break - even analysis & Margin of Safety.
- ◆ Discuss positive and negative Leverage.
- ◆ Discuss Financial leverage as 'Trading on equity'.
- ◆ Discuss Financial Leverage as 'Double Edged Sword'.

CHAPTER OVERVIEW



1. INTRODUCTION

Objective of financial management is to **maximize wealth**. Here, wealth means market value. Value is directly related to performance of company and inversely related to expectation of investors. In turn, expectation of investor is dependent on risk of the company. Therefore, to maximize value, company should try to manage its risk. This risk may be business risk, financial risk or both as defined below:

Business Risk: It refers to the risk associated with the firm's operations. It is the uncertainty about the future operating income (EBIT) i.e., how well can the operating income be predicted?

Financial Risk: It refers to the additional risk placed on the firm's shareholders because of use of debt i.e., the additional risk, a shareholder bears when a company uses debt in addition to equity financing. Companies that issue more debt instruments would have higher financial risk than companies financed mostly or entirely by equity.

In this chapter we will discuss factors that influence business and financial risks.



2. MEANING AND TYPES OF LEVERAGE

2.1 Meaning of Leverage

The term leverage represents **influence or power**. In financial analysis, leverage represents the influence of one financial variable over some other related financial variable. These financial variables may be costs, output, sales revenue, Earnings Before Interest and Tax (EBIT), Earning Per Share (EPS) etc.

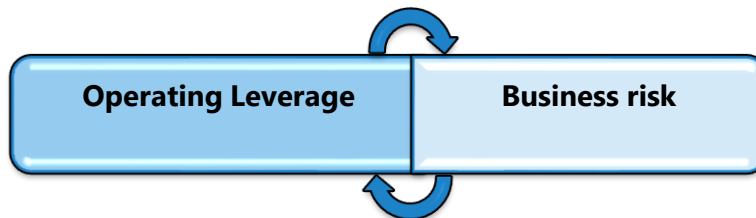
Generally, if we want to calculate the impact of change in variable X on variable Y, it is termed as Leverage of Y with X, and it is calculated as follows:

$$\text{Measurement of Leverage} = \frac{\text{Change in Y} \div \text{Y}}{\text{Change in X} \div \text{X}}$$

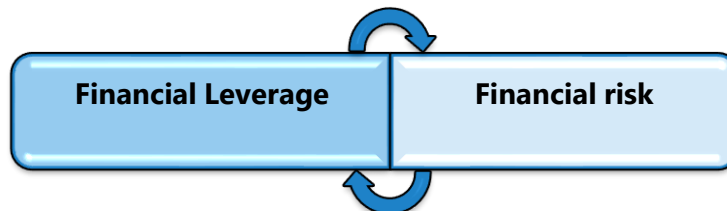
2.2 Types of Leverage

There are three commonly used measures of leverage in financial analysis. These are:

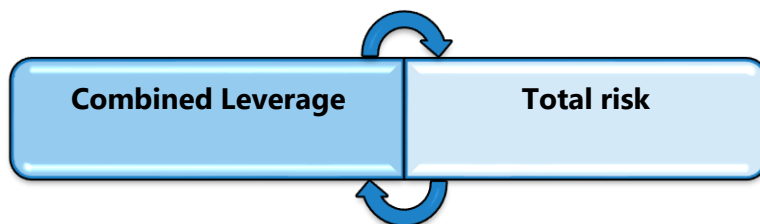
- (i) **Operating Leverage:** It is the relationship between Sales and EBIT and indicates **business risk**.



- (ii) **Financial Leverage:** It is the relationship between EBIT and EPS and indicates **financial risk**.



- (iii) **Combined Leverage:** It is the relationship between Sales and EPS and indicates **total risk** i.e., both business risk and financial risk.



2.3 Chart Showing Degree of Operating Leverage, Financial Leverage and Combined leverage

Profitability Statement			
Sales	xxx	Degree of Operating Leverage	Degree of Combined Leverage
Less: Variable Cost	(xxx)		
Contribution	xxx		
Less: Fixed Cost	(xxx)		
Operating Profit/ EBIT	xxx	Degree of Financial Leverage	
Less: Interest	(xxx)		
Earnings Before Tax (EBT)	xxx		
Less: Tax	(xxx)		
Profit After Tax (PAT)	xxx		
Less: Pref. Dividend (if any)	(xxx)		
Net Earnings available to equity shareholders/ PAT	xxx		
No. Equity shares (N)	xxx		
Earnings per Share (EPS) (PAT ÷ N)	xxx		

3. OPERATING LEVERAGE

Operating Leverage (OL) means tendency of operating income (EBIT) to change disproportionately with change in sale volume. This disproportionate change is caused by operating fixed cost, which does not change with change in sales volume.

In other words, Operating Leverage maybe defined **as the employment of an asset with a fixed cost** so that enough revenue can be generated to cover all the fixed and variable costs.

The use of assets for which a company pays a fixed cost is called operating leverage.

Operating leverage is a function of three factors:

- (i) Amount of fixed cost,
- (ii) Variable contribution margin, and
- (iii) Volume of sales.

3.1 Degree of Operating Leverage (DOL)

When we measure magnitude of disproportionate change, it is termed as degree of leverage. **Degree of Operating Leverage (DOL)** may be defined as percentage change in EBIT with respect to percentage change in sales quantity.

$$\text{Degree of Operating Leverage (DOL)} = \frac{\text{Percentage Change in EBIT}}{\text{Percentage Change in Sales}}$$

Mathematically:

$$\text{DOL} = \frac{\frac{\Delta \text{EBIT}}{\text{EBIT}}}{\frac{\Delta Q}{Q}}$$

Here,

$$\text{EBIT} = Q (S - V) - F$$

Q = Sales quantity

S = Selling price per unit

V = Variable cost per unit

Δ Denotes change

$$\text{DOL} = \frac{\Delta [Q (S - V) - F] / [Q (S - V) - F]}{\Delta Q / Q}$$

Now ΔF is nil because change in fixed cost is nil. Therefore:

$$\text{DOL} = \frac{\Delta Q (S - V) / [Q (S - V) - F]}{\Delta Q / Q} = \frac{\Delta Q (S - V)}{Q (S - V) - F} \times \frac{Q}{\Delta Q} = \frac{Q (S - V)}{Q (S - V) - F}$$

$$\text{DOL} = \frac{\text{Contribution}}{\text{Contribution} - \text{Fixed Cost}} = \frac{\text{Contribution}}{\text{EBIT}}$$

3.2 Break-Even Analysis and Operating Leverage

Break-even analysis is a generally used to study the Cost Volume Profit analysis. It is concerned with computing the break-even point. At break-even point (BEP) of production level and sales, there will be no profit and loss i.e. total cost is equal to total sales revenue.

$$\text{Break-even point in units} = \frac{\text{Fixed Cost}}{\text{Contribution per unit}}$$

Let us understand through the following example:

Example - 1:

Particulars	Product X	Product Y
	(₹)	(₹)
Selling Price p.u.	40	20
Variable Cost p.u.	20	12
Contribution p.u.	20	8
Total Contribution of 1,000 units	20,000	8,000
Fixed Cost	15,000	5,000
Profit (EBIT)	5,000	3,000
Break- even point (Fixed Cost / Contribution)	$\frac{15,000}{20} = 750 \text{ units}$	$\frac{5,000}{8} = 625 \text{ units}$
Operating Leverage $\left(\frac{\text{Contribution}}{\text{EBIT}} \right)$	$\frac{20,000}{5,000} = 4$	$\frac{8,000}{3,000} = 2.67$

There is a relationship between leverage and Break-even point. Both are used for profit planning.

In brief, the relationship between leverage, break-even point and fixed cost is as under:

Leverage	Break-even point
1. Firm with high leverage	1. Higher Break-even point
2. Firm with low leverage	2. Lower Break-even point
Fixed cost	Operating Leverage
1. High fixed cost	1. High degree of operating leverage
2. Lower fixed cost	2. Lower degree of operating leverage

3.3 Margin of Safety (MOS) and Operating Leverage (OL)

In cost accounting, margin of safety (MOS) may be calculated as follows:

$$\text{MOS} = \frac{\text{Sales} - \text{BEP Sales}}{\text{Sales}} \times 100$$

Higher margin of safety indicates lower business risk and higher profit and vice versa. MOS is inversely related to OL.

If we both multiply and divide above formula with profit volume (PV) ratio then:

$$\text{MOS} = \frac{\text{Sales} - \text{BEP Sales}}{\text{Sales}} \times \frac{\text{PV Ratio}}{\text{PV Ratio}} = \frac{(\text{Sales} \times \text{PV Ratio}) - (\text{BEP} \times \text{PV Ratio})}{\text{Sales} \times \text{PV Ratio}}$$

We know that:

$$\text{PV ratio} = \frac{\text{Contribution}}{\text{Sales}} \quad \text{or} \quad \text{Sales} \times \text{PV ratio} = \text{Contribution}$$

And,

$$\text{BEP} = \frac{\text{Fixed Cost}}{\text{PV ratio}} \quad \text{or} \quad \text{BEP} \times \text{PV ratio} = \text{Fixed Cost}$$

So,

$$\text{MOS} = \frac{\text{Contribution} - \text{Fixed Cost}}{\text{Contribution}} = \frac{\text{EBIT}}{\text{Contribution}}$$

Further,

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

hence:

$$\text{Degree of Operating leverage} = \frac{1}{\text{Margin of Safety}}$$

Let us understand this through the following example:

Example – 2:

Particulars	Product X
	(₹)
Sales (50 x 1000 units)	50,000
Variable Cost (30 x 1000 units)	30,000
Contribution	20,000
Fixed Cost	15,000
Profit (EBIT)	5,000
Break- even Sales (Fixed Cost / PV ratio)	$15,000/0.40 = 37,500$
Margin of Safety = $(50,000 - 37,500)/50,000$	0.25
Operating Leverage = $\text{Contribution}/\text{EBIT} = 20,000/5,000$	4
Operating Leverage = $1/\text{MOS} = 1/0.25$	4

If Margin of safety	Business Risk	DOL (1/MOS)
Rises	Falls	Falls
Falls	Rises	Rises

When DOL is more than one (1), operating leverage exists. More is the DOL, higher is operating leverage.

A positive DOL/ OL means that the firm is operating at higher level than the break- even level and both sales and EBIT moves in the same direction. In case of negative DOL/ OL, firm operates at lower than the break-even sales and EBIT is negative.

Situation 1: No Fixed Cost

Particulars	20,000 units	30,000 units
	(₹)	(₹)
Sales @ ₹ 10	2,00,000	3,00,000
Variable cost @ ₹ 5	1,00,000	1,50,000
EBIT	1,00,000	1,50,000

$$\text{Degree of Operative leverage (DOL)} = \frac{\text{Percentage change in EBIT}}{\text{Percentage change in Sales}} = \frac{50\%}{50\%} = 1$$

Situation 2: Positive Leverage

Particulars	20,000 units	30,000 units
	(₹)	(₹)
Sales @ ₹ 10	2,00,000	3,00,000
Variable Cost @ ₹ 5	1,00,000	1,50,000
Contribution	1,00,000	1,50,000
Fixed Cost	50,000	50,000
EBIT	50,000	1,00,000

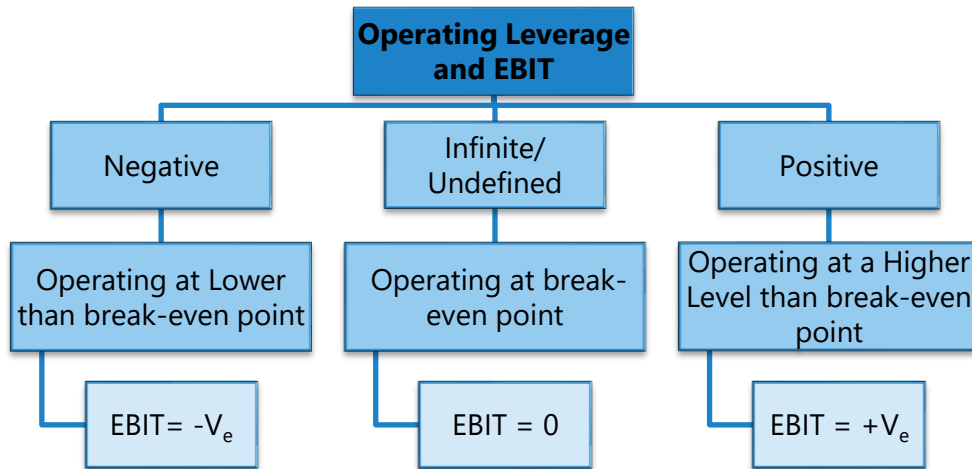
$$\text{Degree of Operative leverage (DOL)} = \frac{\text{Percentage change in EBIT}}{\text{Percentage change in sales}} = \frac{100\%}{50\%} = 2$$

Situation 3: When EBIT is Nil (Contribution = Fixed cost)

$$\text{Degree of Operating Leverage (DOL)} = \frac{\text{Contribution}}{0} = \text{Undefined}$$

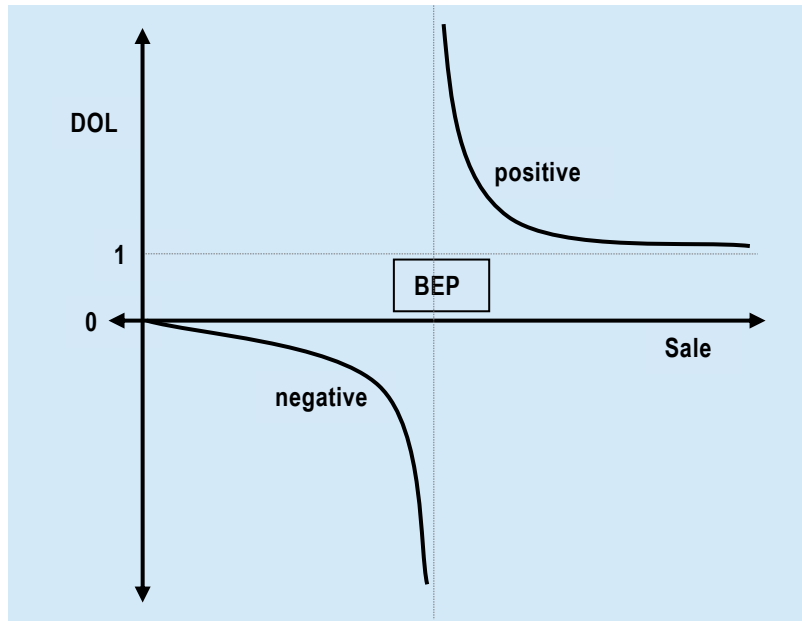
Analysis and Interpretation of operating leverage

S. No.	Situation	Result
1	No Fixed Cost	No operating leverage
2.	Higher Fixed cost	Higher Break-even point
3.	Higher than Break-even level	Positive operating leverage
4.	Lower than Break-even level	Negative operating leverage



Positive and Negative Operating Leverage

Note: DOL can never be between zero and one. It can be zero or less or it can be one or more.



When Sales is much higher than BEP sales, DOL will be slightly more than one. With decrease in sales, DOL will increase. At BEP, DOL will be infinite. When sales is slightly less than BEP, DOL will be negative infinite. With further reduction in sale, DOL will move towards zero. At zero sales, DOL will also be zero.

ILLUSTRATION 1

A Company produces and sells 10,000 shirts. The selling price per shirt is ₹ 500. Variable cost is ₹ 200 per shirt and fixed operating cost is ₹ 25,00,000.

- (a) CALCULATE operating leverage.
 (b) If sales are up by 10%, then COMPUTE the impact on EBIT?

SOLUTION

- (a) Statement of Profitability

	₹
Sales Revenue (10,000 × 500)	50,00,000
Less: Variable Cost (10,000 × 200)	20,00,000
Contribution	30,00,000
Less: Fixed Cost	25,00,000
EBIT	5,00,000

$$\text{Operating Leverage} = \frac{\text{Contribution}}{\text{EBIT}} = \frac{\text{₹ 30 lakhs}}{\text{₹ 5 lakhs}} = 6 \text{ times}$$

$$(b) \text{ Operating Leverage (OL)} = \frac{\% \text{Change in EBIT}}{\% \text{Change in Sales}}$$

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

$$X = ₹ 3,00,000$$

$$\therefore \Delta \text{EBIT} = ₹ 3,00,000 / ₹ 5,00,000 = 60\%$$

ILLUSTRATION 2

CALCULATE the operating leverage for each of the four firms A, B, C and D from the following price and cost data:

	Firms			
	A (₹)	B (₹)	C (₹)	D (₹)
Sale price per unit	20	32	50	70
Variable cost per unit	6	16	20	50
Fixed operating cost	60,000	40,000	1,00,000	Nil

What calculations can you draw with respect to levels of fixed cost and the degree of operating leverage result? EXPLAIN. Assume number of units sold is 5,000.

SOLUTION

	Firms			
	A (₹)	B (₹)	C (₹)	D (₹)
Sales (units)	5,000	5,000	5,000	5,000
Sales revenue (Units × sale price per unit)	1,00,000	1,60,000	2,50,000	3,50,000
Less: Variable cost (Units × variable cost per unit)	(30,000)	(80,000)	(1,00,000)	(2,50,000)
Less: Fixed operating costs	(60,000)	(40,000)	(1,00,000)	Nil
EBIT	10,000	40,000	50,000	1,00,000

$$DOL = \frac{\text{Current sales (S) - Variable costs (VC)}}{\text{Current EBIT}}$$

$$DOL_{(A)} = \frac{₹ 1,00,000 - ₹ 30,000}{₹ 10,000} = 7$$

$$DOL_{(B)} = \frac{₹ 1,60,000 - ₹ 80,000}{₹ 40,000} = 2$$

$$DOL_{(C)} = \frac{₹ 2,50,000 - ₹ 1,00,000}{₹ 50,000} = 3$$

$$DOL_{(D)} = \frac{₹ 3,50,000 - ₹ 2,50,000}{₹ 1,00,000} = 1$$

The operating leverage exists only when there are fixed costs. In the case of firm D, there is no magnified effect on the EBIT due to change in sales. A 20 per cent increase in sales has resulted in a 20 per cent increase in EBIT. In the case of other firms, operating leverage exists. It is maximum in firm A, followed by firm C and minimum in firm B. The interception of DOL of 7 is that 1 per cent change in sales results in 7 per cent change in EBIT level in the direction of the change of sales level of firm A.



4. FINANCIAL LEVERAGE

Financial leverage (FL) maybe defined as '**the use of funds with a fixed cost in order to increase earnings per share**'. In other words, it is the use of company funds on which it pays a limited return. Financial leverage involves the use of funds obtained at a fixed cost in the hope of increasing the return to common stockholders.

$$\text{Financial Leverage (FL)} = \frac{\text{Earnings before interest and tax (EBIT)}}{\text{Earnings before tax (EBT)}}$$

Where, $\text{EBIT} = \text{Sales} - (\text{Variable cost} + \text{Fixed cost})$

$\text{EBT} = \text{EBIT} - \text{Interest}$

4.1 Degree of Financial Leverage (DFL)

Degree of financial leverage is the ratio of the percentage increase in Earnings Per Share (EPS) to the percentage increase in Earnings Before Interest and Taxes (EBIT). Financial Leverage (FL) is also defined as "**the ability of a firm to use fixed financial charges to magnify the effect of changes in EBIT on EPS**".

$$\begin{aligned} \text{Degree of Financial Leverage (DFL)} \\ = \frac{\text{Percentage change in earnings per share (EPS)}}{\text{Percentage change in earnings before interest and tax (EBIT)}} \end{aligned}$$

$$\text{DFL} = \frac{\Delta \text{EPS}}{\text{EPS}} \div \frac{\Delta \text{EBIT}}{\text{EBIT}}$$

ΔEPS means change in EPS and ΔEBIT means change in EBIT.

Now, $EPS = [(EBIT - I)(1 - t)] - D / \text{No. of Shares}$

Here,

$T = \text{Tax Rate}$

$D = \text{Dividend on Preference Shares (inclusive of dividend tax if any)}$

On simplifying the above we get,

$$DFL = \frac{EBIT(1-t)}{(EBIT-Int.)(1-t) - D_p}$$

$$DFL = \frac{EBIT}{(EBIT-Int.) - \frac{D_p}{1-t}}$$

If the company has not issued preference shares, then:

$$DFL = \frac{EBIT}{EBIT-Int.} = \frac{EBIT}{PBT}$$

When DFL is more than one (1), financial leverage exists. More is DFL, higher is financial leverage.

A positive DFL/ FL means firm is operating at a level higher than break-even point and EBIT and EPS moves in the same direction. Negative DFL/ FL indicates the firm is operating at lower than break-even point and EPS is negative.

Let us understand through the following analysis:

Situation 1: No Fixed Interest charges

Particulars	X	Y
	(₹)	(₹)
EBIT	1,00,000	1,50,000
Tax @ 50%	50,000	75,000
PAT	50,000	75,000
No. of shares	10,000	10,000
EPS	5	7.5

$$\text{Degree of Finance Leverage (DFL)} = \frac{\text{Change in EP}}{\text{Change in EBIT}} = \frac{50\%}{50\%} = 1$$

Situation 2: Positive Financial Leverage

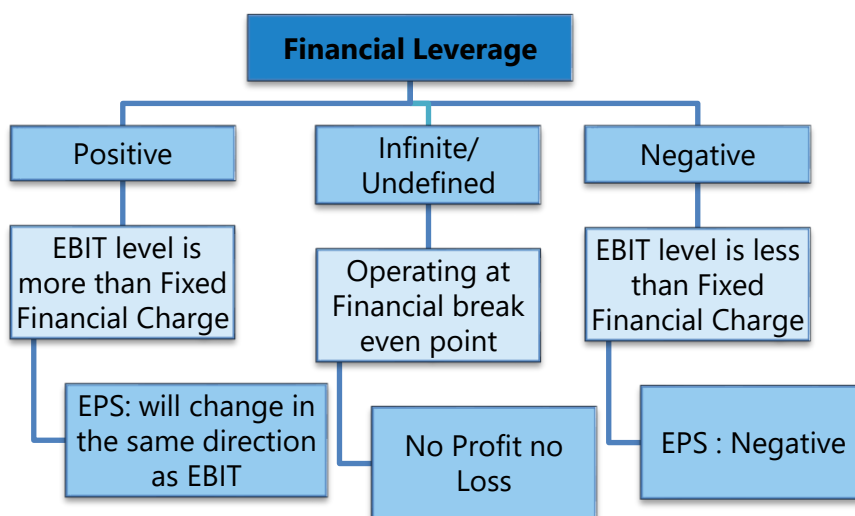
Particulars	X	Y
	(₹)	(₹)
EBIT	1,00,000	1,50,000
Interest	20,000	20,000
EBT	80,000	1,30,000
Tax @ 50%	40,000	65,000
PAT	40,000	65,000
No of Shares	10,000	10,000
EPS	4	6.5

$$\text{Degree of Finance Leverage (DFL)} = \frac{\text{Change in EPS}}{\text{Change in EBIT}} = \frac{62.5\%}{50\%} = 1.25$$

$$*\text{Change in EPS} = \frac{\left(\frac{2.5}{4} \times 100\right)}{50\%} = 62.5\%$$

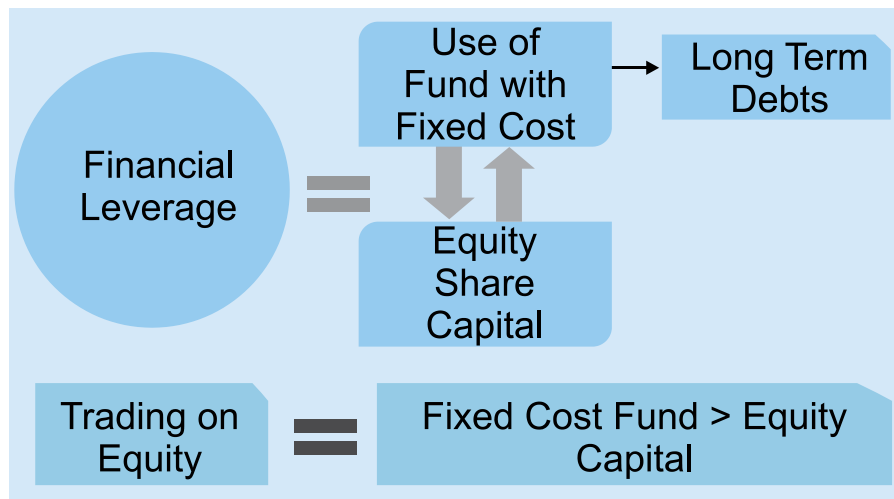
Situation 3. When EBT is nil (EBIT = Fixed Interest)

$$\text{Degree of Finance Leverage (DFL)} = \frac{\text{EBIT}}{\text{Nil}} = \text{Undefined}$$

**Positive and Negative Financial Leverage**

Analysis and Interpretation of Financial leverage

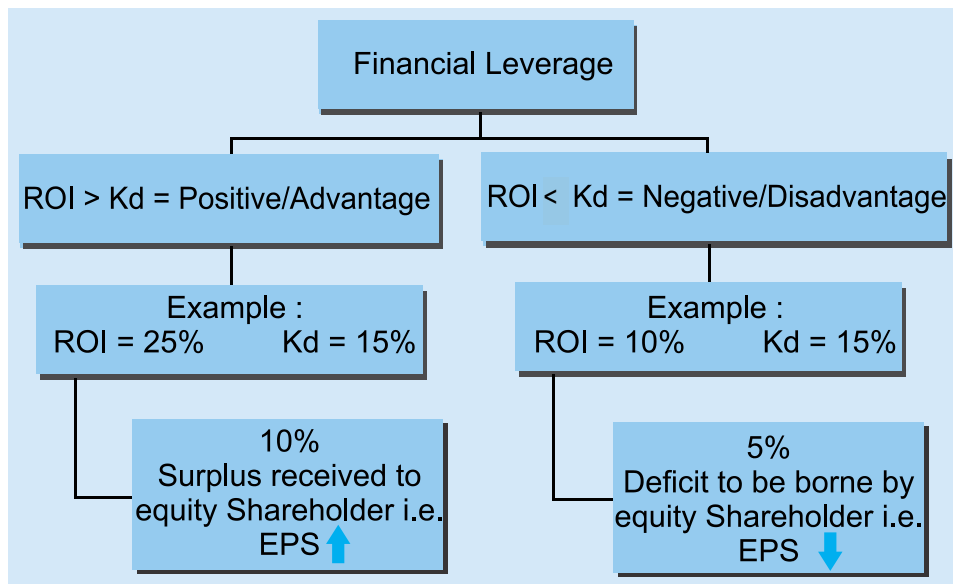
Sl. No.	Situation	Result
1	No Fixed Financial Cost	No Financial leverage
2.	Higher Fixed Financial cost	Higher Financial Leverage
3.	When EBIT is higher than Financial Break-even point	Positive Financial leverage
4.	When EBIT is less then Finance Break-even point	Negative Financial leverage

4.2 Financial Leverage as ‘Trading on Equity’

Financial leverage indicates the use of funds with fixed cost like long term debts and preference share capital along with equity share capital which is known as trading on equity. The basic aim of financial leverage is to increase the earnings available to equity shareholders using fixed cost fund.

A firm is known to have a positive/favourable leverage when its earnings are more than the cost of debt. If earnings are equal to or less than cost of debt, it will be an negative/unfavourable leverage. When the quantity of fixed cost fund is relatively high in comparison to equity capital it is said that the firm is **“trading on equity”**.

4.3 Financial Leverage as a 'Double edged Sword'



When the cost of 'fixed cost fund' is less than the return on investment, financial leverage will help to increase return on equity and EPS. The firm will also benefit from the saving of tax on interest on debts etc. However, when cost of debt will be more than the return it will affect return of equity and EPS unfavourably and as a result firm can be under financial distress. Therefore, financial leverage is also known as "**double edged sword**".

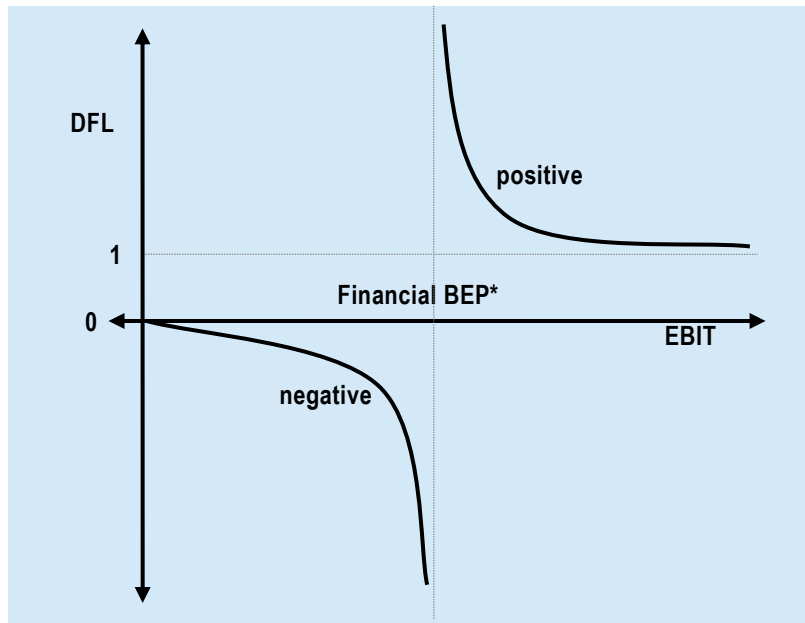
Effect on EPS and ROE:

When, $ROI > \text{Interest}$ – Favourable – Advantage

When, $ROI < \text{Interest}$ – Unfavourable – Disadvantage

When, $ROI = \text{Interest}$ – Neutral – Neither advantage nor disadvantage

Note: DFL can never be between zero and one. It can be zero or less or it can be one or more.



*Financial BEP is the level of EBIT at which earning per share is zero. If a company has not issued preference shares, then Financial BEP is simply equal to amount of Interest.

When EBIT is much higher than Financial BEP, DFL will be slightly more than one. With decrease in EBIT, DFL will increase. At Financial BEP, DFL will be infinite. When EBIT is slightly less than Financial BEP, DFL will be negative infinite. With further reduction in EBIT, DFL will move towards zero. At zero EBIT, DFL will also be zero.

5. COMBINED LEVERAGE

Combined leverage may be defined as the potential use of fixed costs, both operating and financial, **which magnifies the effect of sales volume change on the earning per share of the firm.**

Combined Leverage (CL) = Operating Leverage (OL) × Financial Leverage (FL)

$$= \frac{C}{EBIT} \times \frac{EBIT}{EBT}$$

$$= \frac{C}{EBT}$$

5.1 Degree of Combined Leverage (DCL)

Degree of combined leverage (DCL) is the ratio of percentage change in earning per share to the percentage change in sales. **It indicates the effect the changes in sales will have on EPS.**

$$\begin{aligned}
 \text{DCL} &= \text{DOL} \times \text{DFL} \\
 &= \frac{\% \text{Change in EBIT}}{\% \text{Change in Sales}} \times \frac{\% \text{Change in EPS}}{\% \text{Change in EBIT}} \\
 &= \frac{\% \text{Change in EPS}}{\% \text{Change in Sales}}
 \end{aligned}$$

Like operating leverage and financial leverage, combined leverage can also be positive and negative combined leverage.

5.2 Analysis of Combined Leverage

Combine leverage measures total risk. It depends on combination of operating and financial risk.

DOL	DFL	Comments
Low	Low	Lower total risk. Cannot take advantage of trading on equity.
High	High	Higher total risk. Very risky combination.
High	Low	Moderate total risk. Not a good combination. Lower EBIT due to higher DOL and lower advantage of trading on equity due to low DFL.
Low	High	Moderate total risk. Best combination. Higher financial risk is balanced by lower total business risk.

ILLUSTRATION 3

A firm's details are as under:

Sales (@100 per unit) ₹ 24,00,000

Variable Cost 50%

Fixed Cost ₹ 10,00,000

It has borrowed ₹ 10,00,000 @ 10% p.a. and its equity share capital is ₹ 10,00,000 (₹ 100 each).

Consider tax @ 50 %.

CALCULATE:

- (a) Operating Leverage
- (b) Financial Leverage
- (c) Combined Leverage
- (d) Return on Investment
- (e) If the sales increases by ₹ 6,00,000; what will the new EBIT?

SOLUTION

	(₹)
Sales	24,00,000
Less: Variable cost	12,00,000
Contribution	12,00,000
Less: Fixed cost	10,00,000
EBIT	2,00,000
Less: Interest	1,00,000
EBT	1,00,000
Less: Tax (50%)	50,000
EAT	50,000
No. of equity shares	10,000
EPS	5

- (a) Operating Leverage = $\frac{₹12,00,000}{₹2,00,000} = 6 \text{ times}$
- (b) Financial Leverage = $\frac{₹2,00,000}{₹1,00,000} = 2 \text{ times}$
- (c) Combined Leverage = $OL \times FL = 6 \times 2 = 12 \text{ times.}$
- (d) $ROI = \frac{₹50,000}{₹10,00,000} \times 100 = 5\%$

Here ROI is calculated as ROE i.e. $\frac{\text{EAT - Pref.Dividend}}{\text{Equity shareholders' fund}}$

- (e) Operating Leverage = 6

$$6 = \frac{\Delta \text{ EBIT}}{0.25}$$

$$\Delta \text{ EBIT} = \frac{6 \times 1}{4} = 1.5$$

$$\begin{aligned} \text{Increase in EBIT} &= ₹ 2,00,000 \times 1.5 \\ &= ₹ 3,00,000 \end{aligned}$$

$$\text{New EBIT} = ₹ 5,00,000$$

ILLUSTRATION 4

The following information is related to Yizi Company Ltd. for the current Financial Year:

Equity share capital (of ₹ 10 each)	₹ 50 lakhs
12% Bonds of ₹ 1,000 each	₹ 37 lakhs
Sales	₹ 84 lakhs
Fixed cost (excluding interest)	₹ 6.96 lakhs
Financial leverage	1.49
Profit-volume Ratio	27.55%
Income Tax Applicable	40%

You are required to CALCULATE:

- (i) Operating Leverage;
- (ii) Combined leverage; and
- (iii) Earnings per share.

Show calculations up-to two decimal points.

SOLUTION

Computation of Profits after Tax (PAT)

Particulars	(₹)
Sales	84,00,000
Contribution (Sales × P/V ratio)	23,14,200
Less: Fixed cost (excluding Interest)	(6,96,000)
EBIT (Earnings before interest and tax)	16,18,200
Less: Interest on debentures (12% × ₹37 lakhs)	(4,44,000)
Less: Other fixed Interest (balancing figure)	(88,160)*
EBT (Earnings before tax)	10,86,040
Less: Tax @ 40%	4,34,416
PAT (Profit after tax)	6,51,624

(i) Operating Leverage:

$$= \frac{\text{Contribution}}{\text{EBIT}} = \frac{\text{₹}23,14,200}{\text{₹}16,18,200} = 1.43$$

(ii) Combined Leverage:

$$= \text{Operating Leverage} \times \text{Financial Leverage}$$

$$= 1.43 \times 1.49 = 2.13$$

Or,

$$\text{Combined Leverage} = \frac{\text{Contribution}}{\text{EBIT}} \times \frac{\text{EBIT}}{\text{EBT}}$$

$$\text{Combined Leverage} = \frac{\text{Contribution}}{\text{EBT}} = \frac{\text{₹}23,14,200}{\text{₹}10,86,040} = 2.13$$

$$\text{*Financial Leverage} = \frac{\text{EBIT}}{\text{EBT}} = \frac{\text{₹ 16,18,200}}{\text{EBT}} = 1.49$$

$$\text{So, EBT} = \frac{\text{₹ 16,18,200}}{1.49} = \text{₹ 10,86,040}$$

$$\begin{aligned} \text{Accordingly, other fixed interest} &= \text{₹ 16,18,200} - \text{₹ 10,86,040} - \text{₹ 4,44,000} \\ &= \text{₹ 88,160} \end{aligned}$$

(iii) Earnings per share (EPS):

$$= \frac{\text{PAT}}{\text{No. of shares outstanding}} = \frac{\text{₹ 6,51,624}}{5,00,000 \text{ equity shares}} = \text{₹ 1.30}$$

ILLUSTRATION 5

Following are the selected financial information of A Ltd. and B Ltd. for the current Financial Year:

	A Ltd.	B Ltd.
Variable Cost Ratio	60%	50%
Interest	₹ 20,000	₹ 1,00,000
Operating Leverage	5	2
Financial Leverage	3	2
Tax Rate	30%	30%

You are required to FIND out:

- (i) EBIT
- (ii) Sales
- (iii) Fixed Cost
- (iv) Identify the company which is better placed with reasons based on leverages.

SOLUTION**Company A**

$$(i) \text{ Financial Leverage} = \frac{\text{EBIT}}{\text{EBT i.e EBIT} - \text{Interest}}$$

$$\text{So, } 3 = \frac{\text{EBIT}}{\text{EBIT} - ₹ 20,000}$$

$$\text{Or, } 3 (\text{EBIT} - 20,000) = \text{EBIT}$$

$$\text{Or, } 2 \text{ EBIT} = 60,000$$

$$\text{Or, } \text{EBIT} = 30,000$$

$$(ii) \text{ Operating Leverage} = \frac{\text{Contribution}}{\text{EBIT}} \quad \text{Or, } 5 = \frac{\text{Contribution}}{₹ 30,000}$$

$$\text{Or, Contribution} = ₹ 1, 50,000$$

$$\text{Sales} = \frac{\text{contribution}}{\text{P/V Ratio}(1 - \text{variable cost ratio})} = \frac{₹ 1,50,000}{40\%} = ₹ 3,75,000$$

$$(iii) \text{ Fixed Cost} = \text{Contribution} - \text{EBIT}$$

$$= ₹ 1, 50,000 - 30,000$$

$$\text{Or, Fixed cost} = ₹ 1,20,000$$

Company B

$$(i) \text{ Financial Leverage} = \frac{\text{EBIT}}{\text{EBT i.e EBIT} - \text{Interest}}$$

$$\text{So, } 2 = \frac{\text{EBIT}}{\text{EBIT} - ₹ 1,00,000}$$

$$\text{Or, } 2 (\text{EBIT} - ₹ 1,00,000) = \text{EBIT}$$

$$\text{Or, } 2 \text{ EBIT} - ₹ 2,00,000 = \text{EBIT}$$

$$\text{Or, } \text{EBIT} = ₹ 2,00,000$$

$$(ii) \text{ Operating Leverage} = \frac{\text{Contribution}}{\text{EBIT}}$$

$$\text{Or, } 2 = \frac{\text{Contribution}}{₹ 2,00,000}$$

Or, Contribution = ₹ 4,00,000

$$\text{Sales} = \frac{\text{Contribution}}{\text{P/V Ratio (1 - variable cost ratio)}} = \frac{\text{₹ 4,00,000}}{50\%} = \text{₹ 8,00,000}$$

$$\begin{aligned} \text{(iii) Fixed Cost} &= \text{Contribution} - \text{EBIT} \\ &= \text{₹ 4,00,000} - \text{₹ 2,00,000} \end{aligned}$$

Or, Fixed cost = ₹ 2,00,000

Income Statements of Company A and Company B

	Company A (₹)	Company B (₹)
Sales	3,75,000	8,00,000
Less: Variable cost	2,25,000	4,00,000
Contribution	1,50,000	4,00,000
Less: Fixed Cost	1,20,000	2,00,000
Earnings before interest and tax (EBIT)	30,000	2,00,000
Less: Interest	20,000	1,00,000
Earnings before tax (EBT)	10,000	1,00,000
Less: Tax @ 30%	3,000	30,000
Earnings after tax (EAT)	7,000	70,000

Comment based on Leverage

Comment based on leverage – Company B is better than company A of the following reasons:

- Capacity of Company B to meet interest liability is better than that of companies A (from EBIT/Interest ratio)

$$[A = \frac{\text{₹}30,000}{\text{₹}20,000} = 1.5, B = \frac{\text{₹}2,00,000}{\text{₹}1,00,000} = 2]$$

- Company B has the least financial risk as the total risk (business and financial) of company B is lower (combined leverage of Company A – 15 and Company B- 4)

SUMMARY

DOL	DFL	DCL
Shows level of business risk.	Shows level of financial risk.	Shows level of total or combined risk.
It is dependent upon fixed cost.	It is dependent upon interest and preference dividend	It is dependent upon fixed cost, interest & preference dividend.
Measures % change in EBIT which results from a 1% change in Sales.	Measures % change in EPS which results from a 1% change in EBIT.	Measures % change in EPS which results from a 1% change in Sales.
For example, if DOL is 3 and there is 8% increase in output then EBIT will increase by 24% & if there is a 8% decrease in output then EBIT will decrease by 24%.	For example, if DFL is 2 and there is 5% increase in EBIT then EPS will increase by 10% and if there is a 5% decrease in EBIT then EPS will decrease by 10%.	For example, if DCL is 6 and there is a 8% increase in sales then EPS will increase by 48% and if there is a 8% decrease in sales then EPS will decrease by 48%.
There is a unique DOL for each level of output.	There is a unique DFL for each level of EBIT.	There is a unique DCL for each level of sales.
It is undefined at Operating B.E.P.	It is undefined at Financial B.E.P.	It is undefined at Financial B.E.P.

TEST YOUR KNOWLEDGE

Multiple Choice Questions (MCQs)

1. Given

Operating fixed costs

₹ 20,000

Sales

₹ 1,00,000

P/ V ratio

40%

The operating leverage is:

- (a) 2.00
 - (b) 2.50
 - (c) 2.67
 - (d) 2.47
2. *If EBIT is ₹ 15,00,000, interest is ₹ 2,50,000, corporate tax is 40%, degree of financial leverage is;*
- (a) 1.11
 - (b) 1.20
 - (c) 1.31
 - (d) 1.41
3. *If DOL is 1.24 and DFL is 1.99, DCL would be:*
- (a) 2.14
 - (b) 2.18
 - (c) 2.31
 - (d) 2.47
4. *Operating Leverage is calculated as:*
- (a) $\text{Contribution} \div \text{EBIT}$
 - (b) $\text{EBIT} \div \text{PBT}$
 - (c) $\text{EBIT} \div \text{Interest}$
 - (d) $\text{EBIT} \div \text{Tax}$
5. *Financial Leverage is calculated as:*
- (a) $\text{EBIT} \div \text{Contribution}$
 - (b) $\text{EBIT} \div \text{PBT}$
 - (c) $\text{EBIT} \div \text{Sales}$
 - (d) $\text{EBIT} \div \text{Variables Cost}$

6. Which of the following is correct?
- (a) $CL = OL + FL$
 - (b) $CL = OL - FL$
 - (c) $CL = OL \times FL$
 - (d) $OL = OL \div FL$
7. Which of the following indicates business risk?
- (a) Operating leverage
 - (b) Financial leverage
 - (c) Combined leverage
 - (d) Total leverage
8. Degree of combined leverage is the fraction of:
- (a) Percentage change in EBIT on Percentage change in Sales.
 - (b) Percentage change in EPS on Percentage change in Sales.
 - (c) Percentage change in Sales on Percentage change in EPS.
 - (d) Percentage change in EPS on Percentage change in EBIT.
9. From the following information, calculate combined leverage:
- | | |
|---------------|-----------------------|
| Sales | ₹ 20,00,000 |
| Variable Cost | 40% |
| Fixed Cost | ₹ 10,00,000 |
| Borrowings | ₹ 10,00,000 @ 8% p.a. |
- (a) 10 times
 - (b) 6 times
 - (c) 1.667 times
 - (d) 0.10 times

10. Operating leverage is a function of which of the following factors?
- (a) Amount of variable cost.
 - (b) Variable contribution margin.
 - (c) Volume of purchases.
 - (d) Amount of semi-variable cost.
11. Financial leverage may be defined as:
- (a) Use of funds with a product cost in order to increase earnings per share.
 - (b) Use of funds with a contribution cost in order to increase earnings before interest and taxes.
 - (c) Use of funds with a fixed cost in order to increase earnings per share.
 - (d) Use of funds with a fixed cost in order to increase earnings before interest and taxes.
12. If Margin of Safety is 0.25 and there is 8% increase in output, then EBIT will be:
- (a) Decrease by 2%
 - (b) Increase by 32%
 - (c) Increase by 2%
 - (d) Decrease by 32%
13. If degree of financial leverage is 3 and there is 15% increase in Earning per share (EPS), then EBIT will be:
- (a) Decrease by 15%
 - (b) Increase by 45%
 - (c) Decrease by 45%
 - (d) Increase by 5%

14. When EBIT is much higher than Financial break-even point, then degree of financial leverage will be slightly:
- (a) Less than 1
 - (b) Equals to 1
 - (c) More than 1
 - (d) Equals to 0
15. Firm with high operating leverage will have:
- (a) Higher breakeven point
 - (b) Lower business risk
 - (c) Higher margin of safety
 - (d) All of above
16. When sales are at breakeven point, the degree of operating leverage will be:
- (a) Zero
 - (b) Infinite
 - (c) One
 - (d) None of above
17. If degree of combined leverage is 3 and margin of safety is 0.50, then degree of financial leverage is:
- (a) 6.00
 - (b) 3.00
 - (c) 0.50
 - (d) 1.50

Theoretical Questions

1. DIFFERENTIATE between Business risk and Financial risk.
2. "Operating risk is associated with cost structure, whereas financial risk is associated with capital structure of a business concern." Critically EXAMINE this statement.
3. EXPLAIN the concept of "Double edged sword" in Financial leverage analysis.

Practical Problems

- From the following information extracted from the books of accounts of Imax Ltd., CALCULATE percentage change in earnings per share, if sales increase by 10% and Fixed Operating cost is ₹ 1,57,500.

Particulars	(₹)
EBIT (Earnings before Interest and Tax)	31,50,000
Earnings before Tax (EBT)	14,00,000

- Consider the following information for Mega Ltd.:

Production level	2,500 units
Contribution per unit	₹ 150
Operating leverage	6
Combined leverage	24
Tax rate	30%

Required:

COMPUTE its earnings after tax.

- From the following information, prepare Income Statement of Company A & B:

Particulars	Company A	Company B
Margin of safety	0.20	0.25
Interest	₹ 3,000	₹ 2,000
Profit volume ratio	25%	33.33%
Financial Leverage	4	3
Tax rate	45%	45%

4. The capital structure of PS Ltd. at the end of the current Financial Year consisted as follows:

Particulars	(₹)
Equity share capital (face value ₹ 100 each)	10,00,000
10% debentures (₹ 100 each)	10,00,000

During the year, sales decreased to 1,00,000 units as compared to 1,20,000 units in the previous year. However, the selling price stood at ₹ 12 per unit and variable cost at ₹ 8 per unit for both the years. The fixed expenses were at ₹ 2,00,000 p.a. and the income tax rate is 30%.

You are required to CALCULATE the following:

- The degree of financial leverage at 1,20,000 units and 1,00,000 units.
 - The degree of operating leverage at 1,20,000 units and 1,00,000 units.
 - The percentage change in EPS.
5. The Sale revenue of TM excellence Ltd. @ ₹ 20 Per unit of output is ₹ 20 lakhs and Contribution is ₹ 10 lakhs. At the present level of output, the DOL of the company is 2.5. The company does not have any Preference Shares. The number of Equity Shares are 1 lakh. Applicable corporate Income Tax rate is 50% and the rate of interest on Debt Capital is 16% p.a. CALCULATE the EPS (at sales revenue of ₹ 20 lakhs) and amount of Debt Capital of the company if a 25% decline in Sales will wipe out EPS.
6. Betatronics Ltd. has the following balance sheet and income statement information:

Balance Sheet

Liabilities	(₹)	Assets	(₹)
Equity capital (₹ 10 per share)	8,00,000	Net fixed assets	10,00,000
10% Debt	6,00,000	Current assets	9,00,000
Retained earnings	3,50,000		
Current liabilities	1,50,000		
	19,00,000		19,00,000

Income Statement for the year

Particulars	(₹)
Sales	3,40,000
Operating expenses (including ₹ 60,000 depreciation)	1,20,000
EBIT	2,20,000
Less: Interest	60,000
Earnings before tax	1,60,000
Less: Taxes	56,000
Net Earnings (EAT)	1,04,000

- (a) DETERMINE the degree of operating, financial and combined leverages at the current sales level, if all operating expenses, other than depreciation, are variable costs.
- (b) If total assets remain at the same level, but sales (i) increase by 20 percent and (ii) decrease by 20 percent, COMPUTE the earnings per share at the new sales level?
7. A company had the following Balance Sheet at the end of the current Financial Year:

Liabilities	(₹) in crores	Assets	(₹) in crores
Equity Share Capital (50 lakhs shares of ₹ 10 each)	5	Fixed Assets (Net)	12.5
Reserves and Surplus	1	Current Assets	7.5
15% Debentures	10		
Current Liabilities	4		
	20		20

The additional information given is as under:

Fixed cost per annum (excluding interest)	₹ 4 crores
Variable operating cost ratio	65%
Total assets turnover ratio	2.5
Income Tax rate	30%

Required :

CALCULATE the following and comment:

- (i) Earnings Per Share
- (ii) Operating Leverage
- (iii) Financial Leverage
- (iv) Combined Leverage

8. CALCULATE the operating leverage, financial leverage and combined leverage from the following data under Situation I and II and Financial Plan A and B :

Installed Capacity	4,000 units
Actual Production and Sales	75% of the Capacity
Selling Price	₹ 30 Per Unit
Variable Cost	₹ 15 Per Unit

Fixed Cost:

Under Situation-I	₹ 15,000
Under Situation-II	₹ 20,000

Capital Structure:

	Financial Plan	
	A (₹)	B (₹)
Equity	10,000	15,000
Debt (Rate of Interest at 20%)	10,000	5,000
	20,000	20,000

9. The following particulars relating to Navya Ltd. for the year ended 31st March is given:

Output	1,00,000 units at normal capacity
Selling price per unit	₹ 40
Variable cost per unit	₹ 20
Fixed cost	₹ 10,00,000

The capital structure of the company as on 31st March is as follows:

Particulars	₹
Equity share capital (1,00,000 shares of ₹ 10 each)	10,00,000
Reserves and surplus	5,00,000
7% debentures	10,00,000
Current liabilities	5,00,000
Total	30,00,000

Navya Ltd. has decided to undertake an expansion project to use the market potential, that will involve ₹ 10 lakhs. The company expects an increase in output by 50%. Fixed cost will be increased by ₹ 5,00,000 and variable cost per unit will be decreased by 10%. The additional output can be sold at the existing selling price without any adverse impact on the market.

The following alternative schemes for financing the proposed expansion programme are planned:

- Entirely by equity shares of ₹ 10 each at par.
- ₹ 5 lakh by issue of equity shares of ₹ 10 each and the balance by issue of 6% debentures of ₹ 100 each at par.
- Entirely by 6% debentures of ₹ 100 each at par.

FIND out which of the above-mentioned alternatives would you recommend for Navya Ltd. with reference to the risk and return involved, assuming a corporate tax of 40%.

10. The following details of a company for the year ended 31st March are given below:

Operating leverage	2:1
Combined leverage	2.5:1
Fixed Cost excluding interest	₹ 3.4 lakhs
Sales	₹ 50 lakhs
8% Debentures of ₹ 100 each	₹ 30.25 lakhs
Equity Share Capital of ₹ 10 each	34 lakhs
Income Tax Rate	30%

CALCULATE:

- (i) Financial Leverage
 - (ii) P/V ratio and Earning per Share (EPS)
 - (iii) If the company belongs to an industry, whose assets turnover is 1.5, does it have a high or low assets turnover?
 - (iv) At what level of sales, the Earning before Tax (EBT) of the company will be equal to zero?
11. You are given the following information of 5 firms of the same industry:

Name of the Firm	Change in Revenue	Change in Operating Income	Change in Earning per share
M	28%	26%	32%
N	27%	34%	26%
P	25%	38%	23%
Q	23%	43%	27%
R	25%	40%	28%

You are required to CALCULATE for all firms:

- (i) Degree of operating leverage and

(ii) Degree of combined leverage.

12. The following data have been extracted from the books of LM Ltd:

Sales - ₹ 100 lakhs

Interest Payable per annum - ₹ 10 lakhs

Operating leverage - 1.2

Combined leverage - 2.16

You are required to calculate:

(i) The financial leverage,

(ii) Fixed cost and

(iii) P/V ratio

Case Scenarios

1. BEST Limited, a prominent company in semi-conductors' industry, aims to understand the impact of operating and combined leverage on its financial performance for the year ended 31st March 2024. By examining the provided financial details, the company seeks to make informed decisions regarding its cost structure and financing mix.

BEST Limited is a well-established firm known for its products in the market. With a focus on innovation and customer satisfaction, the company has achieved significant growth and success over the years.

Financial Analysis: For the financial year ending 31st March 2024, BEST Limited provides the following financial details:

- ◆ Fixed Cost (Excluding interest): ₹2,040 Lakhs
- ◆ Sales: ₹30,000 Lakhs
- ◆ 12% Debentures of ₹100 each: ₹21,250 Lakhs
- ◆ Equity Share Capital of ₹10 each: ₹17,000 Lakhs
- ◆ Income tax rate: 30%

Mr. Pallav Kumar, an Executive Director from engineering background discussed following analysis with CA Nagarjuna, Additional Director - Finance of the company:

1. *Operating Leverage: Operating leverage, which is currently at 1.4, measures the impact of fixed costs on the company's operating income.*
2. *Combined Leverage: Combined leverage considers both operating and financial leverage. It is calculated as the product of operating leverage and financial leverage. And company's combined leverage is 2.8.*

CA Nagarjuna explained to Mr. Pallav that the Finance department is already analysing the various leverages like Operating Leverage, Financial Leverage and Combined Leverage. Due to these, BEST Limited gains insights into its cost structure and financial risk. These information enables the company to make strategic decisions regarding its operating expenses, financing options, and overall business strategy. Continuous monitoring and evaluation of leverage ratios will be essential for BEST Limited to maintain financial stability and drive sustainable growth in the competitive market landscape.

Calculate the ratios to understand the financial health of BEST Ltd and CA Nagarjuna can submit his report to Mr. Pallav Kumar.

- (i) *Calculate the Financial Leverage.*
 - (a) 0.5
 - (b) 2
 - (c) 3.92
 - (d) 4
- (ii) *Calculate the Profit Volume Ratio.*
 - (a) 47.60%
 - (b) 15.86%
 - (c) 23.8%
 - (d) 17.43%
- (iii) *Calculate the Earnings Per Share.*
 - (a) ₹ 1.5
 - (b) ₹ 1.05
 - (c) ₹ 4.2
 - (d) ₹ 2.1

- (iv) Calculate the Asset Turnover ratio of BEST Ltd.
- 1
 - 0.5
 - 0.784
 - 1.41
- (v) Calculate the minimum level of Sales which must be attained to at least pay finance cost of BEST Ltd.
- ₹19,286 Lakhs
 - ₹8,574 Lakhs
 - ₹24,000 Lakhs
 - ₹27,000 Lakhs

ANSWERS\SOLUTION

Answers to the MCQs

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

Answers to the Theoretical Questions

- Please refer paragraph 1
- Please refer paragraph 1
- Please refer paragraph 4.3

Answers to the Practical Problems

1. Operating Leverage (OL)

$$= \frac{\text{Contribution}}{\text{EBIT}} = \frac{\text{EBIT} + \text{Fixed Cost}}{\text{EBIT}} = \frac{₹ 31,50,000 + ₹ 1,57,500}{₹ 31,50,000} = 1.05$$

Financial Leverage (FL)

$$= \frac{\text{EBIT}}{\text{EBT}} = \frac{\text{₹ } 31,50,000}{\text{₹ } 14,00,000} = 2.25$$

Combined Leverage (CL)

$$= 1.05 \times 2.25 = 2.3625$$

Percentage Change in Earnings per share

$$\text{DCL} = \frac{\% \text{ change in EPS}}{\% \text{ change in Sales}} = 2.3625 = \frac{\% \text{ change in EPS}}{10\%}$$

$$\therefore \% \text{ change in EPS} = 23.625\%$$

Hence, if sales increases by 10%, EPS will be increased by 23.625%.

2. Workings:

$$\begin{aligned} 1. \quad \text{Operating Leverage} &= \frac{\text{Contribution}}{\text{EBIT}} \\ &= \frac{\text{₹ } 150 \times 2,500}{\text{EBIT}} = \frac{\text{₹ } 3,75,000}{\text{EBIT}} = 6 \end{aligned}$$

$$\therefore \text{EBIT} = \frac{\text{₹ } 3,75,000}{6} = \text{₹ } 62,500$$

$$2. \quad \text{Operating Leverage (OL)} \times \text{Financial Leverage (FL)} = \text{Combined Leverage (CL)}$$

$$6 \times \text{Financial Leverage} = 24$$

$$\therefore \text{Financial Leverage} = 4$$

$$\text{Also, Financial Leverage} = \frac{\text{EBIT}}{\text{EBT}} = 4$$

$$\therefore \text{EBT} = \frac{\text{EBIT}}{4} = \frac{\text{₹ } 62,500}{4} = \text{₹ } 15,625$$

Computation of Earnings after tax

$$\text{Earnings after Tax (EAT)} = \text{EBT} (1 - t)$$

$$= \text{₹ } 15,625 (1 - 0.30) = \text{₹ } 15,625 \times 0.70$$

$$\therefore \text{Earnings after Tax (EAT)} = \text{₹ } 10,938$$

3. Income Statement

Particulars	Company A (₹)	Company B (₹)
Sales	80,000	36,000
Less: Variable Cost	60,000	24,000
Contribution	20,000	12,000
Less: Fixed Cost	16,000	9,000
EBIT	4,000	3,000
Less: Interest	3,000	2,000
EBT	1,000	1,000
Tax (45%)	450	450
EAT	550	550

Workings:

(i) Company A

$$\text{Financial Leverage} = \text{EBIT}/(\text{EBIT} - \text{Interest})$$

$$4 = \text{EBIT}/(\text{EBIT} - ₹ 3,000)$$

$$4\text{EBIT} - ₹ 12,000 = \text{EBIT}$$

$$3\text{EBIT} = ₹ 12,000$$

$$\text{EBIT} = ₹ 4,000$$

Company B

$$\text{Financial Leverage} = \text{EBIT}/(\text{EBIT} - \text{Interest})$$

$$3 = \text{EBIT}/(\text{EBIT} - ₹ 2,000)$$

$$3\text{EBIT} - ₹ 6,000 = \text{EBIT}$$

$$2\text{EBIT} = ₹ 6,000$$

$$\text{EBIT} = ₹ 3,000$$

(ii) Company A

$$\text{Operating Leverage} = 1/\text{Margin of Safety}$$

$$= 1/0.20 = 5$$

$$\begin{aligned}\text{Operating Leverage} &= \text{Contribution/EBIT} \\ 5 &= \text{Contribution}/₹ 4,000 \\ \text{Contribution} &= ₹ 20,000\end{aligned}$$

Company B

$$\begin{aligned}\text{Operating Leverage} &= 1/\text{Margin of Safety} \\ &= 1/0.25 = 4 \\ \text{Operating Leverage} &= \text{Contribution/EBIT} \\ 4 &= \text{Contribution}/₹ 3,000 \\ \text{Contribution} &= ₹ 12,000\end{aligned}$$

(iii) Company A

$$\begin{aligned}\text{Profit Volume Ratio} &= 25\%(\text{Given}) \\ \text{Profit Volume Ratio} &= \text{Contribution/Sales} \times 100 \\ 25\% &= ₹ 20,000/\text{Sales} \\ \text{Sales} &= ₹ 20,000/25\% \\ \text{Sales} &= ₹ 80,000\end{aligned}$$

Company B

$$\begin{aligned}\text{Profit Volume Ratio} &= 33.33\% \\ \text{Therefore, Sales} &= ₹ 12,000/33.33\% \\ \text{Sales} &= ₹ 36,000\end{aligned}$$

4. Income Statement with required calculations

Particulars	(₹)	(₹)
Sales in units	1,20,000	1,00,000
Sales Value	14,40,000	12,00,000
Variable Cost	(9,60,000)	(8,00,000)
Contribution	4,80,000	4,00,000
Fixed expenses	(2,00,000)	(2,00,000)

EBIT	2,80,000	2,00,000
Debenture Interest	(1,00,000)	(1,00,000)
EBT	1,80,000	1,00,000
Tax @ 30%	(54,000)	(30,000)
Profit after tax (PAT)	1,26,000	70,000
No. of shares	10,000	10,000
(i) Financial Leverage $= \frac{\text{EBIT}}{\text{EBT}}$	$= \frac{₹ 2,80,000}{₹ 1,80,000}$ $= 1.56$	$= \frac{₹ 2,00,000}{₹ 1,00,000}$ $= 2$
(ii) Operating leverage $= \frac{\text{Contribution}}{\text{EBIT}}$	$= \frac{₹ 4,80,000}{₹ 2,80,000}$ $= 1.71$	$= \frac{₹ 4,00,000}{₹ 2,00,000}$ $= 2$
(iii) Earnings per share (EPS) $= \frac{\text{PAT}}{\text{No. of shares}}$	$= \frac{₹ 1,26,000}{10,000}$ $= ₹ 12.6$	$= \frac{₹ 70,000}{10,000}$ $= ₹ 7$
Decrease in EPS	$= ₹ 12.6 - ₹ 7 = ₹ 5.6$	
	$\% \text{ decrease in EPS} = \frac{5.6}{12.6} \times 100$ $= 44.44\%$	

5. (i) Calculation of Fixed Cost

$$\text{DOL} = \frac{\text{Contribution}}{\text{Contribution-Fixed Cost}} \text{ or } 2.5 = \frac{₹ 10,00,000}{\text{EBIT}} \text{ or EBIT} = ₹ 4,00,000$$

$$\text{EBIT} = \text{Contribution} - \text{Fixed Cost}$$

$$₹ 4,00,000 = ₹ 10,00,000 - \text{Fixed Cost}$$

$$\text{Fixed Cost} = ₹ 10,00,000 - ₹ 4,00,000 = ₹ 6,00,000$$

(ii) Calculation of Degree of Combined Leverage (DCL)

Question says that 25% change in sales will wipe out EPS. Here, wipe out means it will reduce EPS by 100%.

$$DCL = \frac{\text{Percentage Change in EPS}}{\text{Percentage Change in Sales}} = \frac{100\%}{25\%} = 4$$

(iii) Calculation of Degree of Financial Leverage (DFL)

$$DCL = DOL \times DFL$$

$$4 = 2.5 \times DFL$$

$$\text{So, DFL} = 1.6$$

(iv) Calculation of Interest and amount of Debt

$$DFL = \frac{EBIT}{EBIT - \text{Int}} \text{ Or, } 1.6 = \frac{₹ 4,00,000}{₹ 4,00,000 - \text{Int}} \text{ Or, Int} = ₹ 1,50,000$$

$$\text{Debt} \times \text{Interest rate} = \text{Amount of Interest}$$

$$\text{Debt} \times 16\% = ₹ 1,50,000$$

$$\text{Debt} = ₹ 9,37,500$$

(v) Calculation of Earnings per share (EPS)

$$EPS = \frac{(EBIT - \text{Int})(1 - t)}{N} = \frac{(₹ 4,00,000 - ₹ 1,50,000)0.5}{1,00,000} = ₹ 1.25$$

6. (a) Calculation of Degree of Operating (DOL), Financial (DFL) and Combined leverages (DCL).

$$DOL = \frac{₹ 3,40,000 - ₹ 60,000}{₹ 2,20,000} = 1.27$$

$$DFL = \frac{₹ 2,20,000}{₹ 1,60,000} = 1.38$$

$$DCL = DOL \times DFL = 1.27 \times 1.38 = 1.75$$

(b) Earnings per share at the new sales level

	(i) Increase by 20%	(ii) Decrease by 20%
	(₹)	(₹)
Sales level	4,08,000	2,72,000
Less: Variable expenses	72,000	48,000
Less: Fixed cost	60,000	60,000
Earnings before interest and taxes	2,76,000	1,64,000
Less: Interest	60,000	60,000
Earnings before taxes	2,16,000	1,04,000
Less: Taxes	75,600	36,400
Earnings after taxes (EAT)	1,40,400	67,600
Number of equity shares	80,000	80,000
EPS	1.76	0.85

Working Notes:

- (i) Variable Costs = ₹ 60,000 (total cost – depreciation)
- (ii) Variable Costs at:
- (a) Sales level of ₹ 4,08,000 = ₹ 72,000 (increase by 20%)
- (b) Sales level of ₹ 2,72,000 = ₹ 48,000 (decrease by 20%)

7. Workings:

Total Assets = ₹ 20 crores

Total Asset Turnover Ratio = 2.5

Hence, Total Sales = $20 \times 2.5 = ₹ 50$ crores

Computation of Profit after Tax (PAT)

	(₹) in crores
Sales	50.00

Less: Variable Operating Cost @ 65%	32.50
Contribution	17.50
Less: Fixed Cost (other than Interest)	4.00
EBIT	13.50
Less: Interest on Debentures (15% × ₹ 10 crores)	1.50
PBT	12.00
Less: Tax @ 30%	3.60
PAT	8.40

(i) Earnings per Share

$$\text{EPS} = \frac{\text{PAT}}{\text{Number of Equity Shares}} = \frac{\text{₹ 8.40 crores}}{50,00,000} = \text{₹ 16.80}$$

It indicates the amount, the company earns per share. Investors use this as a guide while valuing the share and making investment decisions. It is also an indicator used in comparing firms within an industry or industry segment.

(ii) Operating Leverage

$$\text{Operating Leverage} = \frac{\text{Contribution}}{\text{EBIT}} = \frac{\text{₹ 17.50 crores}}{\text{₹ 13.50 crores}} = 1.296$$

It indicates the choice of technology and fixed cost in cost structure. It is level specific. When firm operates beyond operating break-even level, then operating leverage is low. It indicates sensitivity of earnings before interest and tax (EBIT) to change in sales at a particular level.

(iii) Financial Leverage

$$\text{Financial Leverage} = \frac{\text{EBIT}}{\text{PBT}} = \frac{\text{₹ 13.50 crores}}{\text{₹ 12.00 crores}} = 1.125$$

The financial leverage is very comfortable since the debt service obligation is small vis-à-vis EBIT.

(iv) Combined Leverage

$$\text{Combined Leverage} = \frac{\text{Contribution}}{\text{EBIT}} \times \frac{\text{EBIT}}{\text{PBT}}$$

Or,

$$= \text{Operating Leverage} \times \text{Financial Leverage}$$

$$= 1.296 \times 1.125 = 1.458$$

The combined leverage studies the choice of fixed cost in cost structure and choice of debt in capital structure. It studies how sensitive the change in EPS is vis-à-vis change in sales. The leverages, operating, financial and combined are used as measurement of risk.

8. (i) Operating Leverage (OL)

	Situation-I	Situation-II
	(₹)	(₹)
Sales (3000 units @ ₹ 30 per unit)	90,000	90,000
Less: Variable Cost (@ ₹ 15 per unit)	45,000	45,000
Contribution (C)	45,000	45,000
Less: Fixed Cost	15,000	20,000
EBIT	30,000	25,000
Operating Leverage (OL) = $\frac{C}{\text{EBIT}}$	$= \frac{₹ 45,000}{₹ 30,000}$ = 1.5	$= \frac{₹ 45,000}{₹ 25,000}$ = 1.8

(ii) Financial Leverage (FL)

	A (₹)	B (₹)
Situation I		
EBIT	30,000	30,000
Less: Interest on debt	2,000	1,000
EBT	28,000	29,000
Financial Leverage (FL) = $\frac{\text{EBIT}}{\text{EBT}}$	$= \frac{₹ 30,000}{₹ 28,000}$ = 1.07	$= \frac{₹ 30,000}{₹ 29,000}$ = 1.034

	A (₹)	B (₹)
Situation-II		
EBIT	25,000	25,000
Less: Interest on debt	2,000	1,000
EBT	23,000	24,000
Financial Leverage (FL) = $\frac{\text{EBIT}}{\text{EBT}}$	$= \frac{₹ 25,000}{₹ 23,000}$ = 1.09	$= \frac{₹ 25,000}{₹ 24,000}$ = 1.04

(iii) Combined Leverage (CL)

	A	B
Situation-I		
CL = FL x OL	1.5 × 1.07 = 1.61	1.5 × 1.034 = 1.55
Situation-II		
CL = FL x OL	1.8 × 1.09 = 1.96	1.8 × 1.04 = 1.872

9. Statement showing Profitability of Alternative Schemes for Financing

(₹ in '00,000)

Particulars	Existing	Alternative Schemes		
		(i)	(ii)	(iii)
Equity Share capital (existing)	10	10	10	10
New issues	-	10	5	-
	10	20	15	10
7% debentures	10	10	10	10
6% debentures	-	-	5	10
	20	30	30	30
Debenture interest (7%)	0.7	0.7	0.7	0.7

Debenture interest (6%)	-	-	0.3	0.6
	0.7	0.7	1.0	1.3
Output (units in lakh)	1	1.5	1.5	1.5
Contribution per. unit (₹) (Selling price - Variable Cost)	20	22	22	22
Contribution (₹ lakh)	20	33	33	33
Less: Fixed cost	10	15	15	15
EBIT	10	18	18	18
Less: Interest (as calculated above)	0.7	0.7	1.0	1.3
EBT	9.3	17.3	17	16.7
Less: Tax (40%)	3.72	6.92	6.8	6.68
EAT	5.58	10.38	10.20	10.02
Operating Leverage (Contribution /EBIT)	2.00	1.83	1.83	1.83
Financial Leverage (EBIT/EBT)	1.08	1.04	1.06	1.08
Combined Leverage (Contribution/EBT)	2.15	1.91	1.94	1.98
EPS (EAT/No. of shares) (₹)	5.58	5.19	6.80	10.02
Risk	-	Lowest	Lower than option (3)	Highest
Return	-	Lowest	Lower than option (3)	Highest

From the above figures, we can see that the Operating Leverage is same in all alternatives though Financial Leverage differs. Alternative (iii) uses the maximum amount of debt and result into the highest degree of financial leverage, followed by alternative (ii). Accordingly, risk of the company will be maximum in these options. Corresponding to this scheme, however, maximum EPS (i.e., ₹ 10.02 per share) will be also in option (iii).

So, if Navya Ltd. is ready to take a high degree of risk, then alternative (iii) is strongly recommended. In case of opting for less risk, alternative (ii) is the next best option with a reduced EPS of ₹ 6.80 per share. In case of alternative (i), EPS is even lower than the existing option, hence not recommended.

10. (i) Financial leverage

$$\text{Combined Leverage} = \text{Operating Leverage (OL)} \times \text{Financial Leverage (FL)}$$

$$2.5 = 2 \times \text{FL}$$

$$\text{Or, FL} = 1.25$$

$$\text{Financial Leverage} = 1.25$$

(ii) P/V Ratio and Earning per share (EPS)

$$\text{Operating leverage} = \frac{\text{Contribution (C)}}{\text{Contribution - Fixed Cost (FC)}}$$

$$2 = \frac{C}{C - 3,40,000}$$

$$\text{Or, C} = 2 (C - 3,40,000)$$

$$\text{Or, C} = 2C - 6,80,000$$

$$\text{Or, Contribution} = ₹ 6,80,000$$

$$\text{Now, P/V ratio} = \frac{\text{Contribution (C)}}{\text{Sales (S)}} \times 100$$

$$= \frac{6,80,000}{50,00,000} \times 100 = 13.6\%$$

Therefore, P/V Ratio = 13.6%

$$\begin{aligned}
 \text{EBT} &= \text{Sales} - \text{Variable Cost} - \text{Fixed Cost} - \text{Interest} \\
 &= ₹50,00,000 - ₹50,00,000 (1-0.136) - ₹3,40,000 - (8\% \times ₹30,25,000) \\
 &= ₹50,00,000 - ₹43,20,000 - ₹3,40,000 - ₹2,42,000 \\
 &= ₹98,000 \\
 \text{PAT} &= \text{EBT}(1-T) = ₹98,000(1-0.3) = ₹68,600 \\
 \text{EPS} &= \frac{\text{Profit after tax}}{\text{No. of equity shares}} \\
 \text{EPS} &= \frac{₹68,600}{3,40,000 \text{ shares}} = ₹0.202
 \end{aligned}$$

(iii) Assets turnover

$$\begin{aligned}
 \text{Assets turnover} &= \frac{\text{Sales}}{\text{Total Assets}^*} \\
 &= \frac{₹50,00,000}{₹34,00,000 + ₹30,25,000} = 0.78
 \end{aligned}$$

0.78 < 1.5 means lower than industry turnover.

*Total Asset = Equity share capital + 8% Debentures

- (iv)** EBT zero means 100% reduction in EBT. Since combined leverage is 2.5, sales have to be dropped by $100/2.5 = 40\%$. Hence new sales will be $₹50,00,000 \times (100 - 40)\% = ₹30,00,000$.

Therefore, at ₹30,00,000 level of sales, the Earnings before Tax (EBT) of the company will be zero.

Alternatively

$$\begin{aligned}
 \text{Required sales when EBT is zero} &= \frac{\text{Fixed Cost} + \text{Interest} + \text{desired Profit}}{\text{P/V Ratio}} \\
 &= \frac{₹3,40,000 + ₹2,42,000 + \text{zero}}{13.60\%} \\
 &= \frac{₹5,82,000}{13.60\%} \\
 &= ₹42,79,412
 \end{aligned}$$

[Note: The question can also be solved by first calculating EBIT with the help of Financial Leverage. Accordingly, answer to the requirement (ii) and (iv) will also vary.

11. Calculation of Degree of Operating leverage and Degree of Combined leverage

Firm	Degree of Operating Leverage (DOL)	Degree of Combined Leverage (DCL)
	$= \frac{\% \text{ change in Operating Income}}{\% \text{ change in Revenue}}$	$= \frac{\% \text{ change in EPS}}{\% \text{ change in Revenue}}$
M	$\frac{26\%}{28\%} = 0.929$	$\frac{32\%}{28\%} = 1.143$
N	$\frac{34\%}{27\%} = 1.259$	$\frac{26\%}{27\%} = 0.963$
P	$\frac{38\%}{25\%} = 1.520$	$\frac{23\%}{25\%} = 0.920$
Q	$\frac{43\%}{23\%} = 1.870$	$\frac{27\%}{23\%} = 1.174$
R	$\frac{40\%}{25\%} = 1.60$	$\frac{28\%}{25\%} = 1.120$

12. (i) Calculation of Financial Leverage:

Combined Leverage (CL) = Operating Leverage (OL) × Financial Leverage (FL)

$$2.16 = 1.2 \times \text{FL}$$

$$\text{FL} = 1.8$$

(ii) Calculation of Fixed cost:

$$\text{Financial Leverage} = \frac{\text{EBIT}}{\text{EBT i.e EBIT} - \text{Interest}}$$

$$1.8 = \frac{\text{EBIT}}{\text{EBIT} - 10,00,000}$$

$$1.8 (\text{EBIT} - 10,00,000) = \text{EBIT}$$

$$1.8 \text{ EBIT} - 18,00,000 = \text{EBIT}$$

$$\text{EBIT} = \frac{18,00,000}{0.8} = ₹ 22,50,000$$

$$\text{Further, Operating Leverage} = \frac{\text{Contribution}}{\text{EBIT}}$$

$$1.2 = \frac{\text{Contribution}}{₹ 22,50,000}$$

$$\text{Contribution} = ₹ 27,00,000$$

$$\text{Fixed Cost} = \text{Contribution} - \text{EBIT}$$

$$= ₹ 27,00,000 - ₹ 22,50,000$$

$$\text{Fixed cost} = ₹ 4,50,000$$

(iii) Calculation of P/V ratio:

$$\text{P/V ratio} = \frac{\text{Contribution (C)}}{\text{Sales (S)}} \times 100 = \frac{27,00,000}{100,00,000} \times 100 = 27\%$$

Answers to the Case Scenarios

1.

i.	(b)	ii.	(c)	iii.	(b)	iv.	(c)	v.	(a)
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(i) Financial leverage

$$\text{Combined Leverage} = \text{Operating Leverage (OL)} \times \text{Financial Leverage (FL)}$$

$$2.8 = 1.4 \times \text{FL}$$

$$\text{FL} = 2$$

$$\text{Financial Leverage} = 2$$

(ii) P/V Ratio

$$\text{P/V ratio} = \frac{\text{Contribution (c)}}{\text{Sales (S)}} \times 100$$

$$\text{Operating leverage} = \frac{C}{C - \text{Fixed Cost (FC)}}$$

$$1.4 = \frac{C}{C - 2040}$$

$$1.4 (C - 2,040) = C$$

$$1.4 C - 2,856 = C$$

$$C = \frac{2,856}{0.4}$$

$$C = ₹ 7,140 \text{ Lakhs}$$

$$P/V = \frac{7,140}{30,000} \times 100 = 23.8\%$$

Therefore, P/V Ratio = **23.8%**

(iii) EPS

$$\text{EPS} = \frac{\text{Profit after tax}}{\text{No. of equity shares}}$$

$$\begin{aligned} \text{EBT} &= C - \text{FC} - \text{Interest} \\ &= 7140 - 2,040 - 2,550 \\ &= ₹ 2,550 \text{ Lakhs} \end{aligned}$$

$$\begin{aligned} \text{PAT} &= \text{EBT} - \text{Tax} \\ &= 2,550 - 765 = ₹ 1,785 \text{ Lakhs} \end{aligned}$$

$$\text{EPS} = \frac{1,785}{1,700} = 1.05$$

(iv) Assets turnover

$$\text{Assets turnover} = \frac{\text{Sales}}{\text{Total Assets}} = \frac{30,000}{38,250} = 0.784$$

$$\begin{aligned} \text{Total Assets} &= \text{Debt} + \text{Equity} = ₹ 21,250 \text{ Lakhs} + ₹ 17,000 \text{ Lakhs} \\ &= ₹ 38,250 \text{ Lakhs} \end{aligned}$$

- (v) The minimum level of Sales which must be attained to at least pay finance cost of BEST Ltd. EBT zero means 100% reduction in EBT. Since the combined leverage is 2.8, sales will be dropped by $100/2.8=35.714\%$. Hence new sales will be;

$$₹ 30,000 \text{ Lakhs} \times (100 - 35.714) = ₹19,286 \text{ Lakhs.}$$

Therefore, at ₹ 19,286 Lakhs level of sales, the Earnings before Tax of the company will be equal to zero.

APPENDIX

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

(The Compound Sum of One Rupee)

Period	1%	2%	3%	4%	5%	6%	7%	8%	9%	10%
1	1.010	1.020	1.030	1.040	1.050	1.060	1.070	1.080	1.090	1.100
2	1.020	1.040	1.061	1.082	1.103	1.124	1.145	1.166	1.188	1.210
3	1.030	1.061	1.093	1.125	1.158	1.191	1.225	1.260	1.295	1.331
4	1.041	1.082	1.126	1.170	1.216	1.262	1.311	1.360	1.412	1.464
5	1.051	1.104	1.159	1.217	1.276	1.338	1.403	1.469	1.539	1.611
6	1.062	1.126	1.194	1.265	1.340	1.419	1.501	1.587	1.677	1.772
7	1.072	1.149	1.230	1.316	1.407	1.504	1.606	1.714	1.828	1.949
8	1.083	1.172	1.267	1.369	1.477	1.594	1.718	1.851	1.993	2.144
9	1.094	1.195	1.305	1.423	1.551	1.689	1.838	1.999	2.172	2.358
10	1.105	1.219	1.344	1.480	1.629	1.791	1.967	2.159	2.367	2.594
11	1.116	1.243	1.384	1.539	1.710	1.898	2.105	2.332	2.580	2.853
12	1.127	1.268	1.426	1.601	1.796	2.012	2.252	2.518	2.813	3.138
13	1.138	1.294	1.469	1.665	1.886	2.133	2.410	2.720	3.066	3.452
14	1.149	1.319	1.513	1.732	1.980	2.261	2.579	2.937	3.342	3.797
15	1.161	1.346	1.558	1.801	2.079	2.397	2.759	3.172	3.642	4.177
16	1.173	1.373	1.605	1.873	2.183	2.540	2.952	3.426	3.970	4.595
17	1.184	1.400	1.653	1.948	2.292	2.693	3.159	3.700	4.328	5.054
18	1.196	1.428	1.702	2.026	2.407	2.854	3.380	3.996	4.717	5.560
19	1.208	1.457	1.754	2.107	2.527	3.026	3.617	4.316	5.142	6.116
20	1.220	1.486	1.806	2.191	2.653	3.207	3.870	4.661	5.604	6.727
25	1.282	1.641	2.094	2.666	3.386	4.292	5.427	6.848	8.623	10.835
30	1.348	1.811	2.427	3.243	4.322	5.743	7.612	10.063	13.268	17.449
35	1.417	2.000	2.814	3.946	5.516	7.686	10.677	14.785	20.414	28.102
40	1.489	2.208	3.262	4.801	7.040	10.286	14.974	21.725	31.409	45.259
50	1.645	2.692	4.384	7.107	11.467	18.420	29.457	46.902	74.358	117.391

Contd.....

Period	11%	12%	13%	14%	15%	16%	17%	18%	19%	20%
1	1.110	1.120	1.130	1.140	1.150	1.160	1.170	1.180	1.190	1.200
2	1.232	1.254	1.277	1.300	1.323	1.346	1.369	1.392	1.416	1.440
3	1.368	1.405	1.443	1.482	1.521	1.561	1.602	1.643	1.685	1.728
4	1.518	1.574	1.630	1.689	1.749	1.811	1.874	1.939	2.005	2.074
5	1.685	1.762	1.842	1.925	2.011	2.100	2.192	2.288	2.386	2.488
6	1.870	1.974	2.082	2.195	2.313	2.436	2.565	2.700	2.840	2.986
7	2.076	2.211	2.353	2.502	2.660	2.826	3.001	3.185	3.379	3.583
8	2.305	2.476	2.658	2.853	3.059	3.278	3.511	3.759	4.021	4.300
9	2.558	2.773	3.004	3.252	3.518	3.803	4.108	4.435	4.785	5.160
10	2.839	3.106	3.395	3.707	4.046	4.411	4.807	5.234	5.695	6.192
11	3.152	3.479	3.836	4.226	4.652	5.117	5.624	6.176	6.777	7.430
12	3.498	3.896	4.335	4.818	5.350	5.936	6.580	7.288	8.064	8.916
13	3.883	4.363	4.898	5.492	6.153	6.886	7.699	8.599	9.596	10.699
14	4.310	4.887	5.535	6.261	7.076	7.988	9.007	10.147	11.420	12.839
15	4.785	5.474	6.254	7.138	8.137	9.266	10.539	11.974	13.590	15.407
16	5.311	6.130	7.067	8.137	9.358	10.748	12.330	14.129	16.172	18.488
17	5.895	6.866	7.986	9.276	10.761	12.468	14.426	16.672	19.244	22.186
18	6.544	7.690	9.024	10.575	12.375	14.463	16.879	19.673	22.901	26.623
19	7.263	8.613	10.197	12.056	14.232	16.777	19.748	23.214	27.252	31.948
20	8.062	9.646	11.523	13.743	16.367	19.461	23.106	27.393	32.429	38.338
25	13.585	17.000	21.231	26.462	32.919	40.874	50.658	62.669	77.388	95.396
30	22.892	29.960	39.116	50.950	66.212	85.850	111.065	143.371	184.675	237.376
35	38.575	52.800	72.069	98.100	133.176	180.314	243.503	327.997	440.701	590.668
40	65.001	93.051	132.782	188.884	267.864	378.721	533.869	750.378	1,051.668	1,469.772
50	184.565	289.002	450.736	700.233	1,083.657	1,670.704	2,566.215	3,927.357	5,988.914	9,100.438

Present value interest factor of Re 1 per period at i% for n periods, PVIF(i,n).

Period	1%	2%	3%	4%	5%	6%	7%	8%	9%	10%
1	0.990	0.980	0.971	0.962	0.952	0.943	0.935	0.926	0.917	0.909
2	0.980	0.961	0.943	0.925	0.907	0.890	0.873	0.857	0.842	0.826
3	0.971	0.942	0.915	0.889	0.864	0.840	0.816	0.794	0.772	0.751
4	0.961	0.924	0.888	0.855	0.823	0.792	0.763	0.735	0.708	0.683
5	0.951	0.906	0.863	0.822	0.784	0.747	0.713	0.681	0.650	0.621
6	0.942	0.888	0.837	0.790	0.746	0.705	0.666	0.630	0.596	0.564
7	0.933	0.871	0.813	0.760	0.711	0.665	0.623	0.583	0.547	0.513
8	0.923	0.853	0.789	0.731	0.677	0.627	0.582	0.540	0.502	0.467
9	0.914	0.837	0.766	0.703	0.645	0.592	0.544	0.500	0.460	0.424
10	0.905	0.820	0.744	0.676	0.614	0.558	0.508	0.463	0.422	0.386
11	0.896	0.804	0.722	0.650	0.585	0.527	0.475	0.429	0.388	0.350
12	0.887	0.788	0.701	0.625	0.557	0.497	0.444	0.397	0.356	0.319
13	0.879	0.773	0.681	0.601	0.530	0.469	0.415	0.368	0.326	0.290
14	0.870	0.758	0.661	0.577	0.505	0.442	0.388	0.340	0.299	0.263
15	0.861	0.743	0.642	0.555	0.481	0.417	0.362	0.315	0.275	0.239
16	0.853	0.728	0.623	0.534	0.458	0.394	0.339	0.292	0.252	0.218
17	0.844	0.714	0.605	0.513	0.436	0.371	0.317	0.270	0.231	0.198
18	0.836	0.700	0.587	0.494	0.416	0.350	0.296	0.250	0.212	0.180
19	0.828	0.686	0.570	0.475	0.396	0.331	0.277	0.232	0.194	0.164
20	0.820	0.673	0.554	0.456	0.377	0.312	0.258	0.215	0.178	0.149
25	0.780	0.610	0.478	0.375	0.295	0.233	0.184	0.146	0.116	0.092
30	0.742	0.552	0.412	0.308	0.231	0.174	0.131	0.099	0.075	0.057
35	0.706	0.500	0.355	0.253	0.181	0.130	0.094	0.068	0.049	0.036
40	0.672	0.453	0.307	0.208	0.142	0.097	0.067	0.046	0.032	0.022
50	0.608	0.372	0.228	0.141	0.087	0.054	0.034	0.021	0.013	0.009

Contd....

Period	11%	12%	13%	14%	15%	16%	17%	18%	19%	20%
1	0.901	0.893	0.885	0.877	0.870	0.862	0.855	0.847	0.840	0.833
2	0.812	0.797	0.783	0.769	0.756	0.743	0.731	0.718	0.706	0.694
3	0.731	0.712	0.693	0.675	0.658	0.641	0.624	0.609	0.593	0.579
4	0.659	0.636	0.613	0.592	0.572	0.552	0.534	0.516	0.499	0.482
5	0.593	0.567	0.543	0.519	0.497	0.476	0.456	0.437	0.419	0.402
6	0.535	0.507	0.480	0.456	0.432	0.410	0.390	0.370	0.352	0.335
7	0.482	0.452	0.425	0.400	0.376	0.354	0.333	0.314	0.296	0.279
8	0.434	0.404	0.376	0.351	0.327	0.305	0.285	0.266	0.249	0.233
9	0.391	0.361	0.333	0.308	0.284	0.263	0.243	0.225	0.209	0.194
10	0.352	0.322	0.295	0.270	0.247	0.227	0.208	0.191	0.176	0.162
11	0.317	0.287	0.261	0.237	0.215	0.195	0.178	0.162	0.148	0.135
12	0.286	0.257	0.231	0.208	0.187	0.168	0.152	0.137	0.124	0.112
13	0.258	0.229	0.204	0.182	0.163	0.145	0.130	0.116	0.104	0.093
14	0.232	0.205	0.181	0.160	0.141	0.125	0.111	0.099	0.088	0.078
15	0.209	0.183	0.160	0.140	0.123	0.108	0.095	0.084	0.074	0.065
16	0.188	0.163	0.141	0.123	0.107	0.093	0.081	0.071	0.062	0.054
17	0.170	0.146	0.125	0.108	0.093	0.080	0.069	0.060	0.052	0.045
18	0.153	0.130	0.111	0.095	0.081	0.069	0.059	0.051	0.044	0.038
19	0.138	0.116	0.098	0.083	0.070	0.060	0.051	0.043	0.037	0.031
20	0.124	0.104	0.087	0.073	0.061	0.051	0.043	0.037	0.031	0.026
25	0.074	0.059	0.047	0.038	0.030	0.024	0.020	0.016	0.013	0.010
30	0.044	0.033	0.026	0.020	0.015	0.012	0.009	0.007	0.005	0.004
35	0.026	0.019	0.014	0.010	0.008	0.006	0.004	0.003	0.002	0.002
40	0.015	0.011	0.008	0.005	0.004	0.003	0.002	0.001	0.001	0.001
50	0.005	0.003	0.002	0.001	0.001	0.001	0.000	0.000	0.000	0.000

**Future value interest factor of an ordinary annuity of Re 1 per period at i% for n periods,
FVIFA(i,n). (The Compound Value of an Annuity of One Rupee)**

Period	1%	2%	3%	4%	5%	6%	7%	8%	9%	10%
1	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
2	2.010	2.020	2.030	2.040	2.050	2.060	2.070	2.080	2.090	2.100
3	3.030	3.060	3.091	3.122	3.153	3.184	3.215	3.246	3.278	3.310
4	4.060	4.122	4.184	4.246	4.310	4.375	4.440	4.506	4.573	4.641
5	5.101	5.204	5.309	5.416	5.526	5.637	5.751	5.867	5.985	6.105
6	6.152	6.308	6.468	6.633	6.802	6.975	7.153	7.336	7.523	7.716
7	7.214	7.434	7.662	7.898	8.142	8.394	8.654	8.923	9.200	9.487
8	8.286	8.583	8.892	9.214	9.549	9.897	10.260	10.637	11.028	11.436
9	9.369	9.755	10.159	10.583	11.027	11.491	11.978	12.488	13.021	13.579
10	10.462	10.950	11.464	12.006	12.578	13.181	13.816	14.487	15.193	15.937
11	11.567	12.169	12.808	13.486	14.207	14.972	15.784	16.645	17.560	18.531
12	12.683	13.412	14.192	15.026	15.917	16.870	17.888	18.977	20.141	21.384
13	13.809	14.680	15.618	16.627	17.713	18.882	20.141	21.495	22.953	24.523
14	14.947	15.974	17.086	18.292	19.599	21.015	22.550	24.215	26.019	27.975
15	16.097	17.293	18.599	20.024	21.579	23.276	25.129	27.152	29.361	31.772
16	17.258	18.639	20.157	21.825	23.657	25.673	27.888	30.324	33.003	35.950
17	18.430	20.012	21.762	23.698	25.840	28.213	30.840	33.750	36.974	40.545
18	19.615	21.412	23.414	25.645	28.132	30.906	33.999	37.450	41.301	45.599
19	20.811	22.841	25.117	27.671	30.539	33.760	37.379	41.446	46.018	51.159
20	22.019	24.297	26.870	29.778	33.066	36.786	40.995	45.762	51.160	57.275
25	28.243	32.030	36.459	41.646	47.727	54.865	63.249	73.106	84.701	98.347
30	34.785	40.568	47.575	56.085	66.439	79.058	94.461	113.28	136.31	164.49
35	41.660	49.994	60.462	73.652	90.320	111.43	138.24	172.32	215.71	271.02
40	48.886	60.402	75.401	95.026	120.80	154.76	199.64	259.06	337.88	442.59
50	64.463	84.579	112.80	152.67	209.35	290.34	406.53	573.77	815.08	1,163.9

Contd....

Period	11%	12%	13%	14%	15%	16%	17%	18%	19%	20%
1	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
2	2.110	2.120	2.130	2.140	2.150	2.160	2.170	2.180	2.190	2.200
3	3.342	3.374	3.407	3.440	3.473	3.506	3.539	3.572	3.606	3.640
4	4.710	4.779	4.850	4.921	4.993	5.066	5.141	5.215	5.291	5.368
5	6.228	6.353	6.480	6.610	6.742	6.877	7.014	7.154	7.297	7.442
6	7.913	8.115	8.323	8.536	8.754	8.977	9.207	9.442	9.683	9.930
7	9.783	10.089	10.405	10.730	11.067	11.414	11.772	12.142	12.523	12.916
8	11.859	12.300	12.757	13.233	13.727	14.240	14.773	15.327	15.902	16.499
9	14.164	14.776	15.416	16.085	16.786	17.519	18.285	19.086	19.923	20.799
10	16.722	17.549	18.420	19.337	20.304	21.321	22.393	23.521	24.709	25.959
11	19.561	20.655	21.814	23.045	24.349	25.733	27.200	28.755	30.404	32.150
12	22.713	24.133	25.650	27.271	29.002	30.850	32.824	34.931	37.180	39.581
13	26.212	28.029	29.985	32.089	34.352	36.786	39.404	42.219	45.244	48.497
14	30.095	32.393	34.883	37.581	40.505	43.672	47.103	50.818	54.841	59.196
15	34.405	37.280	40.417	43.842	47.580	51.660	56.110	60.965	66.261	72.035
16	39.190	42.753	46.672	50.980	55.717	60.925	66.649	72.939	79.850	87.442
17	44.501	48.884	53.739	59.118	65.075	71.673	78.979	87.068	96.022	105.93
18	50.396	55.750	61.725	68.394	75.836	84.141	93.406	103.74	115.27	128.12
19	56.939	63.440	70.749	78.969	88.212	98.603	110.28	123.41	138.17	154.74
20	64.203	72.052	80.947	91.025	102.44	115.38	130.03	146.63	165.42	186.69
25	114.41	133.33	155.62	181.87	212.79	249.21	292.10	342.60	402.04	471.98
30	199.02	241.33	293.20	356.79	434.75	530.31	647.44	790.95	966.71	1,181.9
35	341.59	431.66	546.68	693.57	881.17	1,120.7	1,426.5	1,816.7	2,314.2	2,948.3
40	581.83	767.09	1,013.7	1,342.0	1,779.1	2,360.8	3,134.5	4,163.2	5,529.8	7,343.9
50	1,668.8	2,400.0	3,459.5	4,994.5	7,217.7	10,436	15,090	21,813	31,515	45,497

**Present value interest factor of an (ordinary) annuity of Re 1 per period at i% for n periods,
PVIFA(i,n).**

Period	1%	2%	3%	4%	5%	6%	7%	8%	9%	10%
1	0.990	0.980	0.971	0.962	0.952	0.943	0.935	0.926	0.917	0.909
2	1.970	1.942	1.913	1.886	1.859	1.833	1.808	1.783	1.759	1.736
3	2.941	2.884	2.829	2.775	2.723	2.673	2.624	2.577	2.531	2.487
4	3.902	3.808	3.717	3.630	3.546	3.465	3.387	3.312	3.240	3.170
5	4.853	4.713	4.580	4.452	4.329	4.212	4.100	3.993	3.890	3.791
6	5.795	5.601	5.417	5.242	5.076	4.917	4.767	4.623	4.486	4.355
7	6.728	6.472	6.230	6.002	5.786	5.582	5.389	5.206	5.033	4.868
8	7.652	7.325	7.020	6.733	6.463	6.210	5.971	5.747	5.535	5.335
9	8.566	8.162	7.786	7.435	7.108	6.802	6.515	6.247	5.995	5.759
10	9.471	8.983	8.530	8.111	7.722	7.360	7.024	6.710	6.418	6.145
11	10.368	9.787	9.253	8.760	8.306	7.887	7.499	7.139	6.805	6.495
12	11.255	10.575	9.954	9.385	8.863	8.384	7.943	7.536	7.161	6.814
13	12.134	11.348	10.635	9.986	9.394	8.853	8.358	7.904	7.487	7.103
14	13.004	12.106	11.296	10.563	9.899	9.295	8.745	8.244	7.786	7.367
15	13.865	12.849	11.938	11.118	10.380	9.712	9.108	8.559	8.061	7.606
16	14.718	13.578	12.561	11.652	10.838	10.106	9.447	8.851	8.313	7.824
17	15.562	14.292	13.166	12.166	11.274	10.477	9.763	9.122	8.544	8.022
18	16.398	14.992	13.754	12.659	11.690	10.828	10.059	9.372	8.756	8.201
19	17.226	15.678	14.324	13.134	12.085	11.158	10.336	9.604	8.950	8.365
20	18.046	16.351	14.877	13.590	12.462	11.470	10.594	9.818	9.129	8.514
25	22.023	19.523	17.413	15.622	14.094	12.783	11.654	10.675	9.823	9.077
30	25.808	22.396	19.600	17.292	15.372	13.765	12.409	11.258	10.274	9.427
35	29.409	24.999	21.487	18.665	16.374	14.498	12.948	11.655	10.567	9.644
40	32.835	27.355	23.115	19.793	17.159	15.046	13.332	11.925	10.757	9.779
50	39.196	31.424	25.730	21.482	18.256	15.762	13.801	12.233	10.962	9.915

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Period	11%	12%	13%	14%	15%	16%	17%	18%	19%	20%
1	0.901	0.893	0.885	0.877	0.870	0.862	0.855	0.847	0.840	0.833
2	1.713	1.690	1.668	1.647	1.626	1.605	1.585	1.566	1.547	1.528
3	2.444	2.402	2.361	2.322	2.283	2.246	2.210	2.174	2.140	2.106
4	3.102	3.037	2.974	2.914	2.855	2.798	2.743	2.690	2.639	2.589
5	3.696	3.605	3.517	3.433	3.352	3.274	3.199	3.127	3.058	2.991
6	4.231	4.111	3.998	3.889	3.784	3.685	3.589	3.498	3.410	3.326
7	4.712	4.564	4.423	4.288	4.160	4.039	3.922	3.812	3.706	3.605
8	5.146	4.968	4.799	4.639	4.487	4.344	4.207	4.078	3.954	3.837
9	5.537	5.328	5.132	4.946	4.772	4.607	4.451	4.303	4.163	4.031
10	5.889	5.650	5.426	5.216	5.019	4.833	4.659	4.494	4.339	4.192
11	6.207	5.938	5.687	5.453	5.234	5.029	4.836	4.656	4.486	4.327
12	6.492	6.194	5.918	5.660	5.421	5.197	4.988	4.793	4.611	4.439
13	6.750	6.424	6.122	5.842	5.583	5.342	5.118	4.910	4.715	4.533
14	6.982	6.628	6.302	6.002	5.724	5.468	5.229	5.008	4.802	4.611
15	7.191	6.811	6.462	6.142	5.847	5.575	5.324	5.092	4.876	4.675
16	7.379	6.974	6.604	6.265	5.954	5.668	5.405	5.162	4.938	4.730
17	7.549	7.120	6.729	6.373	6.047	5.749	5.475	5.222	4.990	4.775
18	7.702	7.250	6.840	6.467	6.128	5.818	5.534	5.273	5.033	4.812
19	7.839	7.366	6.938	6.550	6.198	5.877	5.584	5.316	5.070	4.843
20	7.963	7.469	7.025	6.623	6.259	5.929	5.628	5.353	5.101	4.870
25	8.422	7.843	7.330	6.873	6.464	6.097	5.766	5.467	5.195	4.948
30	8.694	8.055	7.496	7.003	6.566	6.177	5.829	5.517	5.235	4.979
35	8.855	8.176	7.586	7.070	6.617	6.215	5.858	5.539	5.251	4.992
40	8.951	8.244	7.634	7.105	6.642	6.233	5.871	5.548	5.258	4.997
50	9.042	8.304	7.675	7.133	6.661	6.246	5.880	5.554	5.262	4.999