



**VENKATESHWARA
OPEN UNIVERSITY**
— www.vou.ac.in —

FINANCIAL MANAGEMENT

MBA

[MBA-202]



FINANCIAL MANAGEMENT

MBA

[MBA-202]



**VENKATESHWARA
OPEN UNIVERSITY**

www.vou.ac.in

BOARD OF STUDIES

Prof Lalit Kumar Sagar

Vice Chancellor

Dr. S. Raman Iyer

Director

Directorate of Distance Education

SUBJECT EXPERT

Dr. Richa Agarwal *Associate Professor*

Dr. Babar Ali Khan *Assistant Professor*

Dr. Adil Hakeem Khan *Assistant Professor*

COURSE CO-ORDINATOR

Mr. Tauha Khan

Registrar

Copyright © IM Pandey, 2019

All rights reserved. No part of this publication which is material protected by this copyright notice may be reproduced or transmitted or utilized or stored in any form or by any means now known or hereinafter invented, electronic, digital or mechanical, including photocopying, scanning, recording or by any information storage or retrieval system, without prior written permission from the Publisher.

Information contained in this book has been published by VIKAS® Publishing House Pvt. Ltd. and has been obtained by its Authors from sources believed to be reliable and are correct to the best of their knowledge. However, the Publisher and its Authors shall in no event be liable for any errors, omissions or damages arising out of use of this information and specifically disclaim any implied warranties or merchantability or fitness for any particular use.



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

VIKAS® PUBLISHING HOUSE PVT LTD

E-28, Sector-8, Noida - 201301 (UP)

Phone: 0120-4078900 • Fax: 0120-4078999

Regd. Office: A-27, 2nd Floor, Mohan Co-operative Industrial Estate, New Delhi 1100 44

Website: www.vikaspublishing.com • Email: helpline@vikaspublishing.com

SYLLABI-BOOK MAPPING TABLE

Financial Management

Syllabi	Mapping in Book
Unit 1: Introduction to Financial Functions Nature, Scope, Objectives, Importance and changing role of finance function, Maximization of Profit vs. Maximization of wealth.	Unit 1: Introduction to Financial Functions (Pages: 3-25)
Unit 2: Financial Forecasting Planning for funds requirement, Preparation of cash budget, Performance Income Statement and Balance sheet etc.	Unit 2: Financial Forecasting (Pages: 27-41)
Unit 3: Sources of Capital Preferred stock and Common stock, Long term debt, Retained earning & their Features, Choice for sources of funds, Capital structure planning.	Unit 3: Source of Capital (Pages: 43-72)
Unit 4: Cost of Capital Cost of Equity capital, preferred capital, Long term debt, Detained Charges, Computation and composite cost of capital	Unit 4: Cost of Capital (Pages: 73-112)
Unit 5: Capital Budgeting Concepts and steps in Capital Budgeting, Average rate of return, pay back period, Present value method, Internal rate of return.	Unit 5: Capital Budgeting (Pages: 113-137)
Unit 6: Analysis and Interpretation of Leverage Meaning, Types of Significance of leverages, Calculation and Interpretation of Financial, Operating and Composite leverages.	Unit 6: Analysis and Interpretation of leverage (Pages: 139-176)
Unit 7: Working Capital Management Definition, Financing current assets, Hedging approach, Level of current and Liquid assets, Factors affecting the requirement for working capital.	Unit 7: Working Capital Management (Pages: 177-210)
Unit 8: Management of Cash and Marketable Securities Motives for holding cash, Problems and ways of controlling the level of cash inflow and out-flow of cash.	Unit 8: Management of Cash and Marketable Securities (Pages: 211-215)
Unit 9: Management of Accounts Receivable Credit and Collection policies, Credit standards and Credit terms and their Evaluation, Controlling the level of accounts receivable.	Unit 9: Management of Accounts Receivable (Pages: 217-254)
Unit 10: Dividend Policy Classification of dividend, Factors governing dividend policies.	Unit 10: Dividend Policies (Pages: 255-282)

CONTENTS

INTRODUCTION	1
UNIT 1 INTRODUCTION TO FINANCIAL FUNCTIONS	3-25
1.0 Introduction	
1.1 Unit Objectives	
1.2 Scope of Finance	
1.2.1 Real and Financial Assets	
1.2.2 Equity and Borrowed Funds	
1.2.3 Finance and Management Functions	
1.3 Financial Functions	
1.3.1 Investment Decision; 1.3.2 Financing Decision	
1.3.3 Dividend Decision; 1.3.4 Liquidity Decision	
1.3.5 Financial Procedures and Systems	
1.4 Financial Manager's Role	
1.4.1 Fund Raising	
1.4.2 Fund Allocation	
1.4.3 Profit Planning	
1.4.4 Understanding Capital Markets	
1.5 Financial Goal: Profit Maximization versus Wealth Maximization	
1.5.1 Profit Maximization	
1.5.2 Objections to Profit Maximization	
1.5.3 Maximizing Profit after Taxes	
1.5.4 Maximizing EPS	
1.5.5 Shareholders' Wealth Maximization (SWM)	
1.5.6 Need for a Valuation Approach	
1.5.7 Risk-return Trade-off	
1.6 Agency Problems: Manager's versus Shareholders' Goals	
1.7 Financial Goal and Firm's Mission and Objectives	
1.8 Organization of the Finance Functions	
1.8.1 Status and Duties of Finance Executives	
1.8.2 Controller's and Treasurer's Functions in the Indian Context	
1.9 Summary	
1.10 Key Terms	
1.11 Answers to 'Check Your Progress'	
1.12 Questions and Exercises	
1.13 Further Reading	
Endnotes/References	
UNIT 2 FINANCIAL FORECASTING	27-41
2.0 Introduction	
2.1 Unit Objectives	
2.2 Planning for Funds Requirement	
2.3 Preparation of Cash Budget	
2.4 Pro Forma Income Statement	
2.5 Balance Sheet	
2.6 Summary	
2.7 Key Terms	
2.8 Answers to 'Check Your Progress'	
2.9 Questions and Exercises	
2.10 Further Reading	
Endnotes/References	

UNIT 3 SOURCE OF CAPITAL

43-72

- 3.0 Introduction
- 3.1 Unit Objectives
- 3.2 Preferred Stock and Common Stock
 - 3.2.1 Default Risk and Credit Rating
- 3.3 Long-Term Debt and Retained Earnings
- 3.4 Choice of Sources of Funds
 - 3.4.1 Debentures and Bonds
- 3.5 Capital Structure Planning
 - 3.5.1 Capital Structure Practices in India
- 3.6 Summary
- 3.7 Key Terms
- 3.8 Answers to 'Check Your Progress'
- 3.9 Questions and Exercises
- 3.10 Further Reading
- Endnotes/References

UNIT 4 COST OF CAPITAL

73-112

- 4.0 Introduction
- 4.1 Unit Objectives
- 4.2 Significance of the Cost of Capital
- 4.3 The Concept of the Opportunity Cost of Capital
- 4.4 Cost of Debt
- 4.5 Cost of Preference Capital
- 4.6 Cost of Equity Capital
- 4.7 Cost of Equity and the Capital Asset Pricing Model (CAPM)
- 4.8 Cost of Equity: CAPM vs Dividend-Growth Model
- 4.9 The Weighted Average Cost of Capital
- 4.10 Flotation Costs, Cost of Capital and Investment Analysis
- 4.11 Calculation of the Cost of Capital in Practice: Case of Larsen and Toubro Limited
- 4.12 Divisional and Project Cost of Capital
- 4.13 Summary
- 4.14 Key Terms
- 4.15 Answers to 'Check Your Progress'
- 4.16 Questions and Exercises
- 4.17 Further Reading
- Endnotes/References

UNIT 5 CAPITAL BUDGETING

113-137

- 5.0 Introduction
- 5.1 Unit Objectives
- 5.2 Concepts and Steps
- 5.3 Average Rate of Return
- 5.4 Payback Period
- 5.5 Present Value Method
- 5.6 Internal Rate of Return
- 5.7 Summary
- 5.8 Key Terms
- 5.9 Answers to 'Check Your Progress'
- 5.10 Questions and Exercises
- 5.11 Further Reading
- Endnotes/References

UNIT 6 ANALYSIS AND INTERPRETATION OF LEVERAGE

139-176

- 6.0 Introduction
- 6.1 Unit Objectives
- 6.2 Financial Leverage
 - 6.2.1 Meaning of Financial Leverage
 - 6.2.2 Measures of Financial Leverage
- 6.3 Financial Leverage and the Shareholders' Return
- 6.4 Combining Financial and Operating Leverages
 - 6.4.1 Composite Leverage: Combined Effect of Operating and Financial Leverages
- 6.5 Financial Leverage and the Shareholders' Risk
- 6.6 Summary
- 6.7 Key Terms
- 6.8 Answers to 'Check your Progress'
- 6.9 Questions and Exercises
- 6.10 Further Reading

UNIT 7 WORKING CAPITAL MANAGEMENT

177-210

- 7.0 Introduction
- 7.1 Unit Objectives
- 7.2 Concepts and Definition
 - 7.2.1 Focusing on Management of Current Assets
 - 7.2.2 Focusing on Liquidity Management
- 7.3 Financing Current Assets
 - 7.3.1 Matching Approach; 7.3.2 Conservative Approach
 - 7.3.3 Aggressive Approach
 - 7.3.4 Short-term vs. Long-term Financing: A Risk-Return Trade-off
- 7.4 Hedging Approach
 - 7.4.1 Risk Hedging with Options
- 7.5 Level of Current and Liquid Assets
- 7.6 Factors Affecting the Requirement of Working Capital
 - 7.6.1 Determinants of Working Capital
 - 7.6.2 Issues in Working Capital Management
- 7.7 Summary
- 7.8 Key Terms
- 7.9 Answers to 'Check Your Progress'
- 7.10 Questions and Exercises
- 7.11 Further Reading

UNIT 8 MANAGEMENT OF CASH AND MARKETABLE SECURITIES

211-215

- 8.0 Introduction
- 8.1 Unit Objectives
- 8.2 Motives for Holding Cash
- 8.3 Ways of Controlling Cash In-flow and Outflow
- 8.4 Summary
- 8.5 Key Terms
- 8.6 Answers to 'Check Your Progress'
- 8.7 Questions and Exercises
- 8.8 Further Reading

UNIT 9 MANAGEMENT OF ACCOUNTS RECEIVABLE

217-254

- 9.0 Introduction
- 9.1 Unit Objectives
- 9.2 Credit Policy: Nature and Goals
 - 9.2.1 Goals of Credit Policy
- 9.3 Optimum Credit Policy: A Marginal Cost–Benefit Analysis
- 9.4 Credit Policy Variables
 - 9.4.1 Credit Standards; 9.4.2 Credit-Granting Decision
 - 9.4.3 Collection Policy and Procedures
- 9.5 Credit Evaluation of Individual Accounts
 - 9.5.1 Credit Information; 9.5.2 Credit Investigation and Analysis
 - 9.5.3 Credit Limit; 9.5.4 Collection Efforts
- 9.6 Monitoring Receivables
- 9.7 Factoring
 - 9.7.1 Nature of Factoring; 9.7.2 Factoring Services
 - 9.7.3 Types of Factoring; 9.7.4 Costs and Benefits of Factoring
- 9.8 Summary
- 9.9 Key Terms
- 9.10 Answers to ‘Check Your Progress’
- 9.11 Questions and Exercises
- 9.12 Further Reading

UNIT 10 DIVIDEND POLICIES

255-282

- 10.0 Introduction
- 10.1 Unit Objectives
- 10.2 Objectives of Dividend Policy
 - 10.2.1 Firm’s Need for Funds
 - 10.2.2 Shareholders’ Need for Income
- 10.3 Practical Considerations in Dividend Policy
 - 10.3.1 Firm’s Investment Opportunities and Financial Needs
 - 10.3.2 Shareholders’ Expectations
 - 10.3.3 Constraints on Paying Dividends
- 10.4 Stability of Dividends
 - 10.4.1 Constant Dividend Per Share or Dividend Rate
 - 10.4.2 Constant Payout
 - 10.4.3 Constant Dividend Per Share Plus Extra Dividend
 - 10.4.4 Merits of Stability of Dividends
 - 10.4.5 Danger of Stability of Dividends
- 10.5 Target Payout and Dividend Smoothing: Lintner’s Model of Corporate Dividend Behaviour
- 10.6 Forms of Dividends
 - 10.6.1 Cash Dividend
 - 10.6.2 Bonus Shares
 - 10.6.3 Advantages of Bonus Shares
 - 10.6.4 Limitations of Bonus Shares
 - 10.6.5 Conditions for the Issue of Bonus Shares
- 10.7 Share Split
 - 10.7.1 Bonus Share versus Share Split
 - 10.7.2 Reasons for Share Split
 - 10.7.3 Reverse Split
- 10.8 Dividend Policy Analysis: Case of (L&T) Limited
- 10.9 Summary
- 10.10 Key Terms
- 10.11 Answers to ‘Check Your Progress’
- 10.12 Questions and Exercises
- 10.13 Further Reading

INTRODUCTION

About three decades ago, the scope of financial management was confined to the raising of funds. Little significance was attached to the analytical thinking in financial decision-making and problem solving. As a consequence, the earlier finance textbooks were structured around this theme and contained a description of the instruments and the institutions of raising funds and of major events, like promotion, reorganization, readjustment, merger and consolidation when funds were raised. In the mid-1950s, the emphasis shifted to the judicious utilization of funds. The modern thinking in financial management accords a far greater importance to management decision-making and policy. Today, financial managers do not perform the passive role of scorekeepers of financial data and information, and arranging funds, whenever directed to do so. Rather, they occupy key positions in top management areas and play a dynamic role in solving complex management problems. They are now responsible for shaping the fortunes of the enterprise and are involved in the most vital management decision of allocation of capital. It is their duty to ensure that the funds are raised most economically and used in the most efficient and effective manner. Because of this change in emphasis, the descriptive treatment of the subject of financial management is being replaced by analytical content and sound theoretical underpinnings.

This book, *Financial Management*, combines theory with practical applications. With a strong foundation, readers can easily understand the theories and methods, decision criteria, and financial policies and strategies necessary to manage funds and create and enhance the value of the firm. The book aims at assisting the reader to develop a thorough understanding of the concepts and theories underlying financial management in a systematic way. To accomplish this purpose, the recent thinking in the field of finance has been presented in a lucid, simple, unambiguous and precise manner. Concepts are made clear in simple language before introducing complicated and sophisticated techniques and theories.

This book has been written, keeping with the self-instructional mode or the SIM (Self Instructional Material) format for Distance Learning. Each unit begins with an *Introduction* to the topic, followed by an outline of the *Unit Objectives*. The detailed content is then presented in a simple and organized manner, interspersed with ‘*Check Your Progress*’ questions to test the student’s understanding of the topics covered. A *Summary* along with a list of *Key Terms* and a set of *Questions and Exercises* is provided at the end of each unit for effective recapitulation. Relevant illustrations have been included for better understanding of the topics.

NOTES

UNIT 1 INTRODUCTION TO FINANCIAL FUNCTIONS

*Introduction to
Financial Functions*

NOTES

Structure

- 1.0 Introduction
- 1.1 Unit Objectives
- 1.2 Scope of Finance
 - 1.2.1 Real and Financial Assets
 - 1.2.2 Equity and Borrowed Funds
 - 1.2.3 Finance and Management Functions
- 1.3 Financial Functions
 - 1.3.1 Investment Decision; 1.3.2 Financing Decision
 - 1.3.3 Dividend Decision; 1.3.4 Liquidity Decision
 - 1.3.5 Financial Procedures and Systems
- 1.4 Financial Manager's Role
 - 1.4.1 Fund Raising
 - 1.4.2 Fund Allocation
 - 1.4.3 Profit Planning
 - 1.4.4 Understanding Capital Markets
- 1.5 Financial Goal: Profit Maximization versus Wealth Maximization
 - 1.5.1 Profit Maximization
 - 1.5.2 Objections to Profit Maximization
 - 1.5.3 Maximizing Profit after Taxes
 - 1.5.4 Maximizing EPS
 - 1.5.5 Shareholders' Wealth Maximization (SWM)
 - 1.5.6 Need for a Valuation Approach
 - 1.5.7 Risk-return Trade-off
- 1.6 Agency Problems: Manager's versus Shareholders' Goals
- 1.7 Financial Goal and Firm's Mission and Objectives
- 1.8 Organization of the Finance Functions
 - 1.8.1 Status and Duties of Finance Executives
 - 1.8.2 Controller's and Treasurer's Functions in the Indian Context
- 1.9 Summary
- 1.10 Key Terms
- 1.11 Answers to 'Check Your Progress'
- 1.12 Questions and Exercises
- 1.13 Further Reading
- Endnotes/References

1.0 INTRODUCTION

The financial function is that managerial activity which is concerned with the planning and controlling of the firm's financial resources. It was a branch of economics till 1890, but as a separate discipline, it is of recent origin. Still, it has no unique body of knowledge of its own, and draws heavily on economics for its theoretical concepts even today.

The subject of the finance function is of immense interest to both academicians and practising managers. It is of great interest to academicians because the subject is still developing, and there are still certain areas where controversies exist for which no unanimous solutions have been reached as yet. Practising managers are interested in this subject because among the most crucial decisions of the firm are those which relate

to finance, and an understanding of the theory of the financial function provides them with conceptual and analytical insights to make those decisions skilfully.

NOTES

1.1 UNIT OBJECTIVES

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

- Explain the nature and scope of finance function and its interaction with other management functions
- Review the changing role of the finance manager and the various areas he has to be responsible for
- Focus on the shareholders' wealth maximization (SWM) principle as an operationally desirable finance decision criterion
- Discuss agency problems arising from the relationship between shareholders and managers
- Illustrate organization of finance function

1.2 SCOPE OF FINANCE

What is finance? What are a firm's financial activities? How are they related to the firm's other activities? Firms create manufacturing capacities for production of goods; some provide services to customers. They sell their goods or services to earn profit. They raise funds to acquire manufacturing and other facilities. Thus, the three most important activities of a business firm are:

- Production
- Marketing
- Finance

A firm secures whatever capital it needs and employs it (finance activity) in activities, which generate returns on invested capital (production and marketing activities).

1.2.1 Real and Financial Assets

A firm requires real assets to carry on its business. **Tangible real assets** are physical assets that include plant, machinery, office, factory, furniture and building. **Intangible real assets** include technical know-how, technological collaborations, patents and copyrights. **Financial assets**, also called securities, are financial papers or instruments such as shares and bonds or debentures. Firms issue securities to investors in the **primary capital markets** to raise necessary funds. The securities issued by firms are traded – bought and sold – by investors in the **secondary capital markets**, referred to as stock exchanges. Financial assets also include lease obligations and borrowing from banks, financial institutions and other sources. In a **lease**, the lessee obtains a right to use the lessor's asset for an agreed amount of rental over the period of lease. Funds applied to assets by the firm are called capital expenditures or investment. The firm expects to receive return on investment and might distribute return (or profit) as dividends to investors.

1.2.2 Equity and Borrowed Funds

There are two types of funds that a firm can raise—equity funds (simply called equity) and borrowed funds (called debt). A firm sells shares to acquire equity funds. **Shares**

represent ownership rights of their holders. Buyers of shares are called **shareholders** (or stockholders), and they are the legal owners of the firm whose shares they hold. Shareholders invest their money in the shares of a company in the expectation of a return on their invested capital. The return of shareholders consists of dividend and capital gain. Shareholders make capital gains (or loss) by selling their shares.

Shareholders can be of two types—ordinary and preference. **Preference shareholders** receive dividend at a fixed rate, and they have a priority over **ordinary shareholders**. The dividend rate for ordinary shareholders is not fixed, and it can vary from year to year depending on the decision of the board of directors. The payment of dividends to shareholders is not a legal obligation; it depends on the discretion of the board of directors. Since ordinary shareholders receive dividend (or repayment of invested capital, only when the company is wound up) after meeting the obligations of others, they are generally called **owners of residue**. Dividends paid by a company are not deductible expenses for calculating corporate income taxes, and they are paid out of profits after corporate taxes. As per the current laws in India, a company is required to pay 12.5 per cent tax on dividends.

A company can also obtain equity funds by retaining earnings available for shareholders. Retained earnings, which could be referred to as internal equity, are undistributed profits of equity capital. The retention of earnings can be considered as a form of raising new capital. If a company distributes all earnings to shareholders, then, it can re-acquire new capital from the same sources (existing shareholders) by issuing new shares called **rights shares**. Also, a **public issue** of shares may be made to attract new (as well as the existing) shareholders to contribute equity capital.

Another important source of securing capital is **creditors or lenders**. Lenders are not the owners of the company. They make money available to the firm as loan or debt and retain title to the funds lent. Loans are generally furnished for a specified period at a fixed rate of interest. For lenders, the return on loans or debt comes in the form of interest paid by the firm. Interest is a cost of debt to the firm. Payment of interest is a legal obligation. The amount of interest paid by a firm is a deductible expense for computing corporate income taxes. Thus, interest provides tax shield to a firm. The interest tax shield is valuable to a firm. The firm may borrow funds from a large number of sources, such as banks, financial institutions, public or by issuing bonds or debentures. A **bond** or a **debenture** is a certificate acknowledging the amount of money lent by a bondholder to the company. It states the amount, the rate of interest and the maturity of the bond or debenture. Since bond or debenture is a financial instrument, it can be traded in the secondary capital markets.

1.2.3 Finance and Management Functions

There exists an inseparable relationship between finance on the one hand and production, marketing and other functions on the other. Almost all business activities, directly or indirectly, involve the acquisition and use of funds. For example, recruitment and promotion of employees in production is clearly a responsibility of the production department; but it requires payment of wages and salaries and other benefits, and thus, involves finance. Similarly, buying a new machine or replacing an old machine for the purpose of increasing productive capacity affects the flow of funds. Sales promotion policies come within the purview of marketing, but advertising and other sales promotion activities require outlays of cash and therefore, affect financial resources.

NOTES

Check Your Progress

1. What is the advantage enjoyed by financial assets vis-à-vis real assets in a business?
2. What are the main types of shareholder funds available to a company?
3. Which are the major ways in which a company may be able to raise new capital?
4. Why are borrowed funds often preferred over equity by firms to fund their businesses?

NOTES

Where is the separation between production and marketing functions on the one hand and the finance function of making money available to meet the costs of production and marketing operations on the other hand? Where do the production and marketing functions end and the finance function begin? There are no clear-cut answers to these questions. Though the finance function of raising and using money has a significant effect on other functions, yet it needs not necessarily be limited or constrained to the general running of the business. A company in a tight financial position will, of course, give more weight to financial considerations, and devise its marketing and production strategies in the light of the financial constraint. On the other hand, management of a company, which has a reservoir of funds or a regular supply of funds, will be more flexible in formulating its production and marketing policies. In fact, financial policies will be devised to fit production and marketing decisions of a firm in practice.

1.3 FINANCE FUNCTIONS

It may be difficult to separate the finance functions from production, marketing and other functions, but the functions themselves can be readily identified. The functions of raising funds, investing them in assets and distributing returns earned from assets to shareholders are respectively known as *financing decision*, *investment decision* and *dividend decision*. A firm attempts to balance cash inflows and outflows while performing these functions. This is called *liquidity decision*, and we may add it to the list of important finance decisions or functions. Thus, finance functions include:

- Long-term asset-mix or investment decision
- Capital-mix or financing decision
- Profit allocation or dividend decision
- Short-term asset-mix or liquidity decision

A firm performs finance functions simultaneously and continuously in the normal course of the business. They do not necessarily occur in a sequence. Finance functions call for skilful planning, control and execution of a firm's activities.

Let us note at the outset that shareholders are made better off by a financial decision that increases the value of their shares. Thus while performing the finance functions, the financial manager should strive to maximize the market value of shares. This point is elaborated in detail later on in the unit.

1.3.1 Investment Decision

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

NOTES

There is a broad agreement that the correct cut-off rate or the **required rate of return** on investments is the opportunity cost of capital.¹ The **opportunity cost of capital** is the expected rate of return that an investor could earn by investing his or her money in financial assets of equivalent risk. However, there are problems in computing the opportunity cost of capital in practice from the available data and information. A decision maker should be aware of these problems.

1.3.2 Financing Decision

Financing decision is the second important function to be performed by the financial manager. Broadly, he or she must decide when, where from and how to acquire funds to meet the firm's investment needs. The central issue before him or her is to determine the appropriate proportion of equity and debt. The mix of debt and equity is known as the firm's **capital structure**. The financial manager must strive to obtain the best financing mix or the **optimum capital structure** for his or her firm. The firm's capital structure is considered optimum when the market value of shares is maximized.

In the absence of debt, the shareholders' return is equal to the firm's return. The use of debt affects the return and risk of shareholders; it may increase the return on equity funds, but it always increases risk as well. The change in the shareholders' return caused by the change in the profits is called the **financial leverage**. A proper balance will have to be struck between return and risk. When the shareholders' return is maximized with given risk, the market value per share will be maximized and the firm's capital structure would be considered optimum. Once the financial manager is able to determine the best combination of debt and equity, he or she must raise the appropriate amount through the best available sources. In practice, a firm considers many other factors such as control, flexibility, loan covenants, legal aspects etc. in deciding its capital structure.

1.3.3 Dividend Decision

Dividend decision is the third major financial decision. The financial manager must decide whether the firm should distribute all profits, or retain them, or distribute a portion and retain the balance. The proportion of profits distributed as dividends is called the **dividend-payout ratio** and the retained portion of profits is known as the **retention ratio**. Like the debt policy, the dividend policy should be determined in terms of its impact on the shareholders' value. The **optimum dividend policy** is one that maximizes the market value of the firm's shares. Thus, if shareholders are not indifferent to the firm's dividend policy, the financial manager must determine the optimum dividend-payout ratio. Dividends are generally paid in cash. But a firm may issue bonus shares. **Bonus shares** are shares issued to the existing shareholders without any charge. The financial manager should consider the questions of dividend stability, bonus shares and cash dividends in practice.

1.3.4 Liquidity Decision

Investment in current assets affects the firm's profitability and liquidity. Current assets management that affects a firm's liquidity is yet another important finance function. Current assets should be managed efficiently for safeguarding the firm against the risk of illiquidity. Lack of liquidity (or illiquidity) in extreme situations can lead to the firm's insolvency. A conflict exists between profitability and liquidity while managing current assets. If the firm does not invest sufficient funds in current assets, it may become

NOTES

illiquid and therefore, risky. But it would lose profitability, as idle current assets would not earn anything. Thus, a proper trade-off must be achieved between profitability and liquidity. The **profitability-liquidity trade-off** requires that the financial manager should develop sound techniques of managing current assets. He or she should estimate firm's needs for current assets and make sure that funds would be made available when needed.

In sum, financial decisions directly concern the firm's decision to acquire or dispose off assets and require commitment or recommitment of funds on a continuous basis. It is in this context that finance functions are said to influence production, marketing and other functions of the firm. Hence finance functions may affect the size, growth, profitability and risk of the firm, and ultimately, the value of the firm. To quote Ezra Solomon:²

'The function of financial management is to review and control decisions to commit or recommit funds to new or ongoing uses. Thus, in addition to raising funds, financial management is directly concerned with production, marketing and other functions, within an enterprise whenever decisions are made about the acquisition or distribution of assets.'

1.3.5 Financial Procedures and Systems

For the effective execution of the finance functions, certain other functions have to be routinely performed. They concern procedures and systems and involve a lot of paper work and time. They do not require specialised skills of finance. Some of the important routine finance functions are:

- Supervision of cash receipts and payments and safeguarding of cash balances
- Custody and safeguarding of securities, insurance policies and other valuable papers
- Taking care of the mechanical details of new outside financing
- Record keeping and reporting

The finance manager, in the modern enterprises, is mainly involved in the managerial finance functions; executives at lower levels carry out the routine finance functions. The financial manager's involvement in the routine functions is confined to setting up of rules of procedures, selecting forms to be used, establishing standards for the employment of competent personnel and to check the performance to see that the rules are observed and that the forms are properly used.

The involvement of the financial manager in the managerial financial functions is recent. About three decades ago, the scope of finance functions or the role of the financial manager was limited to routine activities. How the scope of finance function has widened or the role of the finance manager has changed is discussed in the following section.

1.4 FINANCIAL MANAGER'S ROLE

Who is a financial manager?³ What is his or her role? A **financial manager** is a person who is responsible, in a significant way, to carry out the finance functions. It should be noted that, in a modern enterprise, the financial manager occupies a key position. He or she is one of the members of the top management team, and his or her role, day-by-day, is becoming more pervasive, intensive and significant in solving the complex funds management problems. Now his or her function is not confined to that of a scorekeeper maintaining records, preparing reports and raising funds when needed, nor is he or she a

Check Your Progress

5. List the main areas of financial decision making.
6. Define opportunity cost of capital.

NOTES

staff officer—in a passive role of an adviser. The finance manager is now responsible for shaping the fortunes of the enterprise, and is involved in the most vital decision of the allocation of capital. In his or her new role, he or she needs to have a broader and far-sighted outlook, and must ensure that the funds of the enterprise are utilised in the most efficient manner. He or she must realise that his or her actions have far-reaching consequences for the firm because they influence the size, profitability, growth, risk and survival of the firm, and as a consequence, affect the overall value of the firm. The financial manager, therefore, must have a clear understanding and a strong grasp of the nature and scope of the finance functions.

The financial manager has not always been in the dynamic role of decision-making. About three decades ago, he or she was not considered an important person, as far as the top management decision-making was concerned. He or she became an important management person only with the advent of the modern or contemporary approach to the financial management. What are the main functions of a financial manager?

1.4.1 Fund Raising

The traditional approach dominated the scope of financial management and limited the role of the financial manager simply to funds raising. It was during the major events, such as promotion, reorganization, expansion or diversification in the firm that the financial manager was called upon to raise funds. In his or her day-to-day activities, his or her only significant duty was to see that the firm had enough cash to meet its obligations. Because of its central emphasis on the procurement of funds, the finance textbooks, for example, in the USA, till the mid-1950s covered discussion of the instruments, institutions and practices through which funds were obtained. Further, as the problem of raising funds was more intensely felt in the special events, these books also contained detailed descriptions of the major events like mergers, consolidations, reorganizations and recapitalisations involving **episodic financing**.⁴ The finance books in India and other countries simply followed the American pattern. The notable feature of the traditional view of financial management was the assumption that the financial manager had no concern with the decision of allocating the firm's funds. These decisions were assumed as given, and he or she was required to raise the needed funds from a combination of various sources.

The traditional approach did not go unchallenged even during the period of its dominance. But the criticism related more to the treatment of various topics rather than the basic definition of the finance function. The traditional approach has been criticised because it failed to consider the day-to-day managerial problems relating to finance of the firm. It concentrated itself to looking into the problems from management's—*the insider's point of view*.⁵ Thus, the traditional approach of looking at the role of the financial manager lacked a conceptual framework for making financial decisions, misplaced emphasis on raising of funds, and neglected the real issues relating to the allocation and management of funds.

1.4.2 Fund Allocation

The traditional approach outlived its utility in the changed business situation particularly after the mid-1950s. A number of economic and environmental factors, such as the increasing pace of industrialisation, technological innovations and inventions, intense competition, increasing intervention of government on account of management inefficiency and failure, population growth and widened markets, during and after mid-1950s,

NOTES

necessitated efficient and effective utilisation of the firm's resources, including financial resources. The development of a number of management skills and decision-making techniques facilitated the implementation of a system of optimum allocation of the firm's resources. As a result, the approach to, and the scope of financial management, also changed. The emphasis shifted from the episodic financing to the financial management, from raising of funds to efficient and effective use of funds. The new approach is embedded in sound conceptual and analytical theories.

The new or modern approach to finance is an analytical way of looking into the financial problems of the firm. Financial management is considered a vital and an integral part of overall management. To quote Ezra Solomon:⁶

'In this broader view the central issue of financial policy is the wise use of funds, and the central process involved is a rational matching of advantages of potential uses against the cost of alternative potential sources so as to achieve the broad financial goals which an enterprise sets for itself.'

Thus, in a modern enterprise, the basic finance function is to decide about the expenditure decisions and to determine the demand for capital for these expenditures. In other words, the financial manager, in his or her new role, is concerned with the **efficient allocation of funds**. The allocation of funds is not a new problem, however. It did exist in the past, but it was not considered important enough in achieving the firm's long run objectives.

In his or her new role of using funds wisely, the financial manager must find a rationale for answering the following three questions:⁷

- How large should an enterprise be, and how fast should it grow?
- In what form should it hold its assets?
- How should the funds required be raised?

As discussed earlier, the questions stated above relate to three broad decision areas of financial management: investment (including both long and short-term assets), financing and dividend. The 'modern' financial manager has to help making these decisions in the most rational way. They have to be made in such a way that the funds of the firm are used optimally. We have referred to these decisions as managerial finance functions since they require special care and extraordinary managerial ability.

As discussed earlier, the financial decisions have a great impact on all other business activities. The concern of the financial manager, besides his traditional function of raising money, will be on determining the size and technology of the firm, in setting the pace and direction of growth and in shaping the profitability and risk complexion of the firm by selecting the best asset mix and financing mix.

1.4.3 Profit Planning

The functions of the financial manager may be broadened to include profit-planning function. **Profit planning** refers to the operating decisions in the areas of pricing, costs, volume of output and the firm's selection of product lines. Profit planning is, therefore, a prerequisite for optimising investment and financing decisions.⁸ The cost structure of the firm, i.e. the mix of fixed and variable costs has a significant influence on a firm's profitability. **Fixed costs** remain constant while **variable costs** change in direct proportion to volume changes. Because of the fixed costs, profits fluctuate at a higher degree than the fluctuations in sales. The change in profits due to the change in sales is referred to as **operating leverage**. Profit planning helps to anticipate the relationships between volume, costs and profits and develop action plans to face unexpected surprises.

Check Your Progress

7. What are the main tasks of the finance manager in today's business environment?
8. Define profit planning.

1.4.4 Understanding Capital Markets

Capital markets bring investors (lenders) and firms (borrowers) together. Hence the financial manager has to deal with capital markets. He or she should fully understand the operations of capital markets and the way in which the capital markets value securities. He or she should also know how risk is measured and how to cope with it in investment and financing decisions. For example, if a firm uses excessive debt to finance its growth, investors may perceive it as risky. The value of the firm's share may, therefore, decline. Similarly, investors may not like the decision of a highly profitable, growing firm to distribute dividend. They may like the firm to reinvest profits in attractive opportunities that would enhance their prospects for making high capital gains in the future. Investments also involve risk and return. It is through their operations in capital markets that investors continuously evaluate the actions of the financial manager.

NOTES

1.5 FINANCIAL GOAL: PROFIT MAXIMIZATION VERSUS WEALTH MAXIMIZATION

The firm's investment and financing decisions are unavoidable and continuous. In order to make them rationally, the firm must have a goal. It is generally agreed in theory that the financial goal of the firm should be **shareholders' wealth maximization** (SWM), as reflected in the market value of the firm's shares. In this section, we show that the shareholders' wealth maximization is theoretically logical and operationally feasible **normative goal** for guiding the financial decision-making.

1.5.1 Profit Maximization

Firms, producing goods and services, may function in a market economy, or in a government-controlled economy. In a market economy, prices of goods and services are determined in competitive markets. Firms in the market economy are expected to produce goods and services desired by society as efficiently as possible.

Price system is the most important organ of a market economy indicating what goods and services society wants. Goods and services in great demand command higher prices. This results in higher profit for firms; more of such goods and services are produced. Higher profit opportunities attract other firms to produce such goods and services. Ultimately, with intensifying competition, an equilibrium price is reached at which demand and supply match. In the case of goods and services, which are not required by society, their prices and profits fall. Producers drop such goods and services in favour of more profitable opportunities.⁹ Price system directs managerial efforts towards more profitable goods or services. Prices are determined by the demand and supply conditions as well as the competitive forces, and they guide the allocation of resources for various productive activities.¹⁰

A legitimate question may be raised: Would the price system in a free market economy serve the interests of the society? Adam Smith has given the answer many years ago. According to him:¹¹

‘(The businessman), by directing...industry in such a manner as its produce may be of greater value...intends only his own gain, and he is in this, as in many other cases, led by an invisible hand to promote an end which was not part of his intention...pursuing his own interest he frequently promotes that of society more effectually than he really intends to promote it.’

NOTES

Following Smith's logic, it is generally held by economists that under the conditions of free competition, businessmen pursuing their own self-interests also serve the interest of society. It is also assumed that when individual firms pursue the interest of maximizing profits, society's resources are efficiently utilised.

In the economic theory, the behaviour of a firm is analysed in terms of profit maximization. **Profit maximization** implies that a firm either produces maximum output for a given amount of input, or uses minimum input for producing a given output. The underlying logic of profit maximization is efficiency. It is assumed that profit maximization causes the efficient allocation of resources under the competitive market conditions, and profit is considered as the most appropriate measure of a firm's performance.

1.5.2 Objections to Profit Maximization

The profit maximization objective has been criticised. It is argued that profit maximization assumes perfect competition, and in the face of imperfect modern markets, it cannot be a legitimate objective of the firm. It is also argued that profit maximization, as a business objective, developed in the early 19th century when the characteristic features of the business structure were self-financing, private property and single entrepreneurship. The only aim of the single owner then was to enhance his or her individual wealth and personal power, which could easily be satisfied by the profit maximization objective.¹² The modern business environment is characterised by limited liability and a divorce between management and ownership. Shareholders and lenders today finance the business firm but it is controlled and directed by professional management. The other important **stakeholders** of the firm are customers, employees, government and society. In practice, the objectives of these stakeholders or constituents of a firm differ and may conflict with each other. The manager of the firm has the difficult task of reconciling and balancing these conflicting objectives. In the new business environment, profit maximization is regarded as unrealistic, difficult, inappropriate and immoral.¹³

It is also feared that profit maximization behaviour in a market economy may tend to produce goods and services that are wasteful and unnecessary from the society's point of view. Also, it might lead to inequality of income and wealth. It is for this reason that governments tend to intervene in business. The price system and therefore, the profit maximization principle may not work due to imperfections in practice. Oligopolies and monopolies are quite common phenomena of modern economies. Firms producing same goods and services differ substantially in terms of technology, costs and capital. In view of such conditions, it is difficult to have a truly competitive price system, and thus, it is doubtful if the profit-maximizing behaviour will lead to the optimum social welfare. However, it is not clear that abandoning profit maximization, as a decision criterion, would solve the problem. Rather, government intervention may be sought to correct market imperfections and to promote competition among business firms. A market economy, characterised by a high degree of competition, would certainly ensure efficient production of goods and services desired by society.¹⁴

Is profit maximization an operationally feasible criterion? Apart from the aforesaid objections, profit maximization fails to serve as an operational criterion for maximizing the owner's economic welfare. It fails to provide an operationally feasible measure for ranking alternative courses of action in terms of their economic efficiency. It suffers from the following limitations:¹⁵

- It is vague
- It ignores the timing of returns
- It ignores risk

Definition of profit: The precise meaning of the profit maximization objective is unclear. The definition of the term profit is ambiguous. Does it mean short- or long-term profit? Does it refer to profit before or after tax? Total profits or profit per share? Does it mean total operating profit or profit accruing to shareholders?

Time value of money: The profit maximization objective does not make an explicit distinction between returns received in different time periods. It gives no consideration to the time value of money, and it values benefits received in different periods of time as the same.

Uncertainty of returns: The streams of benefits may possess different degree of certainty. Two firms may have same total expected earnings, but if the earnings of one firm fluctuate considerably as compared to the other, it will be more risky. Possibly, owners of the firm would prefer smaller but surer profits to a potentially larger but less certain stream of benefits.

1.5.3 Maximizing Profit After Taxes

Let us put aside the first problem mentioned above, and assume that maximizing profit means maximizing profits after taxes, in the sense of net profit as reported in the profit and loss account (income statement) of the firm. It can easily be realised that maximizing this figure will not maximize the economic welfare of the owners. It is possible for a firm to increase profit after taxes by selling additional equity shares and investing the proceeds in low-yielding assets, such as the government bonds. Profit after taxes would increase but **earnings per share** (EPS) would decrease. To illustrate, let us assume that a company has 10,000 shares outstanding, profit after taxes of ₹ 50,000 and earnings per share of ₹ 5. If the company sells 10,000 additional shares at ₹ 50 per share and invests the proceeds (₹ 500,000) at 5 per cent after taxes, then the total profits after taxes will increase to ₹ 75,000. However, the earnings per share will fall to ₹ 3.75 (i.e., ₹ 75,000/20,000). This example clearly indicates that maximizing profits after taxes does not necessarily serve the best interests of owners.

1.5.4 Maximizing EPS

If we adopt maximizing EPS as the financial objective of the firm, this will also not ensure the maximization of owners' economic welfare. It also suffers from the flaws already mentioned, i.e. it ignores timing and risk of the expected benefits. Apart from these problems, maximization of EPS has certain deficiencies as a financial objective. For example, note the following observation:¹⁶

... For one thing, it implies that the market value of the company's shares is a function of earnings per share, which may not be true in many instances. If the market value is not a function of earnings per share, then maximization of the latter will not necessarily result in the highest possible price for the company's shares. Maximization of earnings per share further implies that the firm should make no dividend payments so long as funds can be invested internally at any positive rate of return, however small. Such a dividend policy may not always be to the shareholders' advantage.

It is, thus, clear that maximizing profits after taxes or EPS as the financial objective fails to maximize the economic welfare of owners. Both methods do not take account of the timing and uncertainty of the benefits. An alternative to profit maximization, which solves these problems, is the objective of **wealth maximization**. This objective is also considered consistent with the survival goal and with the personal objectives of managers such as recognition, power, status and personal wealth.

NOTES

NOTES

1.5.5 Shareholders' Wealth Maximization (SWM)

What is meant by shareholders' wealth maximization (SWM)? SWM means maximizing the net present value of a course of action to shareholders. **Net present value (NPV)** or wealth of a course of action is the difference between the present value of its benefits and the present value of its costs.¹⁷ A financial action that has a positive NPV creates wealth for shareholders and, therefore, is desirable. A financial action resulting in negative NPV should be rejected since it would destroy shareholders' wealth. Between **mutually exclusive projects** the one with the highest NPV should be adopted. NPVs of a firm's projects are additive in nature. That is

$$NPV(A) + NPV(B) = NPV(A + B)$$

This is referred to as the **principle of value-additivity**. Therefore, the wealth will be maximized if NPV criterion is followed in making financial decisions.¹⁸

The objective of SWM takes care of the questions of the timing and risk of the expected benefits. These problems are handled by selecting an appropriate rate (the shareholders' opportunity cost of capital) for discounting the expected flow of future benefits. *It is important to emphasise that benefits are measured in terms of cash flows.* In investment and financing decisions, it is the flow of cash that is important, not the accounting profits.

The objective of SWM is an appropriate and operationally feasible criterion to choose among the alternative financial actions. It provides an unambiguous measure of what financial management should seek to maximize in making investment and financing decisions on behalf of shareholders.¹⁹

Maximizing the shareholders' economic welfare is equivalent to maximizing the utility of their consumption over time. With their wealth maximized, shareholders can adjust their cash flows in such a way as to optimise their consumption. From the shareholders' point of view, the wealth created by a company through its actions is reflected in the market value of the company's shares. Therefore, the wealth maximization principle implies that the *fundamental objective of a firm is to maximize the market value of its shares*. The value of the company's shares is represented by their market price that, in turn, is a reflection of shareholders' perception about quality of the firm's financial decisions. The market price serves as the firm's performance indicator. How is the market price of a firm's share determined?

1.5.6 Need for a Valuation Approach

SWM requires a valuation model. The financial manager must know or at least assume the factors that influence the market price of shares, otherwise he or she would find himself or herself unable to maximize the market value of the company's shares. What is the appropriate share valuation model? In practice, innumerable factors influence the price of a share, and also, these factors change very frequently. Moreover, these factors vary across shares of different companies. For the purpose of the financial management problem, we can phrase the crucial questions normatively: How much *should* a particular share be worth? Upon what factor or factors *should* its value depend? Although there is no simple answer to these questions, it is generally agreed that the value of an asset depends on its risk and return.

Exhibit 1.1: BHEL'S Mission and Objectives

BHEL defines its vision, mission, values and objectives as follows:

- **Vision** To become a world class, innovative, competitive and profitable engineering enterprise providing total business solutions.
- **Business mission** To be the leading Indian engineering enterprise providing quality products, systems and services in the fields of energy, transportation, industry, infrastructure and other potential areas.
- **Values**
 - o Meeting commitments made to external and internal customers.
 - o Fostering learning, creativity and speed of response.
 - o Respect for dignity and potential of individuals.
 - o Loyalty and pride in the company.
 - o Team playing.
 - o Zeal to excel.
 - o Integrity and fairness in all matters.
- **Objectives** BHEL defines its objectives as follows:
 - o **Growth** To ensure a steady growth by enhancing the competitive edge of BHEL in existing business, new areas and international operations so as to fulfil national expectations for BHEL.
 - o **Profitability** To provide a reasonable and adequate return on capital employed, primarily through improvements in operational efficiency, capacity utilisation and productivity, and generate adequate internal resources to finance the company's growth.
 - o **Customer focus** To build a high degree of customer confidence by providing increased value for his money through international standards of product quality, performance and superior customer service.
 - o **People orientation** To enable each employee to achieve his potential, improve his capabilities, perceive his role and responsibilities and participate and contribute positively to the growth and success of the company. To invest in human resources continuously and be alive to their needs.
 - o **Technology** To achieve technological excellence in operations by development of indigenous technologies and efficient absorption and adaptation of imported technologies to sustain needs and priorities, and provide a competitive advantage to the company.
 - o **Image** To fulfil the expectations which shareholders like government as owner, employees, customers and the country at large have from BHEL.

Source: BHEL's Annual Reports.

NOTES

1.5.7 Risk-return Trade-off

Financial decisions incur different degree of risk. Your decision to invest your money in government bonds has less risk as interest rate is known and the **risk of default** is very less. On the other hand, you would incur more risk if you decide to invest your money in shares, as return is not certain. However, you can *expect* a lower return from government bond and higher from shares. Risk and expected return move in tandem; the greater the risk, the greater the expected return. Figure 1.1 shows this **risk-return relationship**.

NOTES

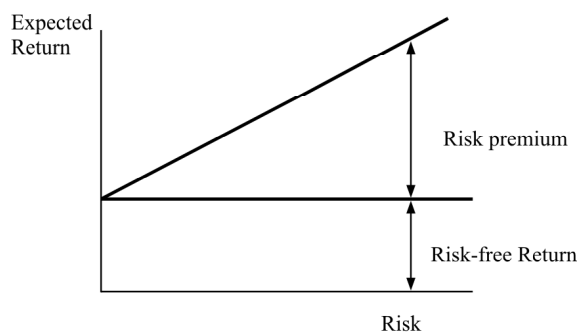


Fig. 1.1 The Risk-return Relationship

Financial decisions of the firm are guided by the **risk-return trade-off**. These decisions are interrelated and jointly affect the market value of its shares by influencing return and risk of the firm. The relationship between return and risk can be simply expressed as follows:

$$\text{Return} = \text{Risk-free rate} + \text{Risk premium} \quad (1)$$

Risk-free rate is a rate obtainable from a default-risk free government security. An investor assuming risk from her investment requires a **risk premium** above the risk-free rate. Risk-free rate is a compensation for time and risk premium for risk. Higher the risk of an action, higher will be the risk premium leading to higher required return on that action. A proper balance between return and risk should be maintained to maximize the market value of a firm's shares. Such balance is called risk-return trade-off, and every financial decision involves this trade-off. The interrelation between market value, financial decisions and risk-return trade-off is depicted in Figure 1.2. It also gives an overview of the functions of financial management.

The financial manager, in a bid to maximize shareholders' wealth, should strive to maximize returns in relation to the given risk; he or she 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 utilised. The financial reporting system must be designed to provide timely and accurate picture of the firm's activities.

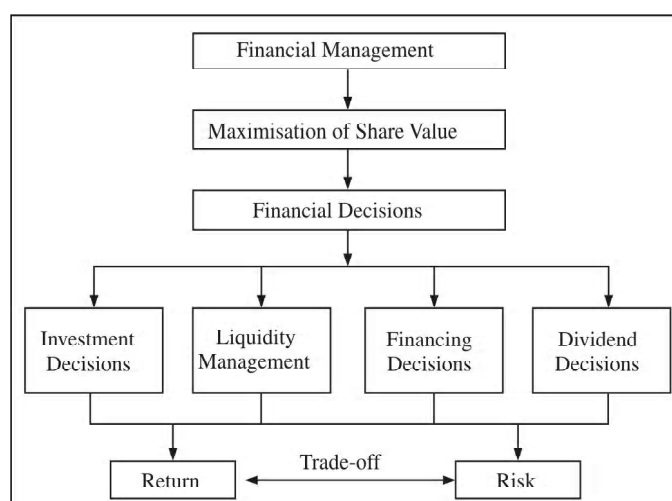


Fig. 1.2 An Overview of Financial Management

Check Your Progress

9. What should be the financial goal of a firm?
10. Why are indicators like profits after taxes and earnings per share not the best ways to decide financial goals of a firm?
11. Define risk-free rate.

1.6 AGENCY PROBLEMS: MANAGER'S VERSUS SHAREHOLDERS' GOALS

In large companies, there is a divorce between management and ownership. The decision-taking authority in a company lies in the hands of managers. Shareholders as owners of a company are the principals and managers are their agents. Thus, there is a **principal-agent relationship** between shareholders and managers. In theory, managers should act in the best interests of shareholders; that is, their actions and decisions should lead to SWM. In practice, managers may not necessarily act in the best interest of shareholders, and they may pursue their own personal goals. Managers may maximize their own wealth (in the form of high salaries and perks) at the cost of shareholders, or may play safe and create satisfactory wealth for shareholders than the maximum. They may avoid taking high investment and financing risks that may otherwise be needed to maximize shareholders' wealth. Such 'satisficing' behaviour of managers will frustrate the objective of SWM as a *normative guide*. It is in the interests of managers that the firm survives in the long run. Managers also wish to enjoy independence and freedom from outside interference, control and monitoring. Thus, their actions are very likely to be directed towards the goals of survival and self-sufficiency²⁰. Further, a company is a complex organization consisting of multiple stakeholders such as employees, debt-holders, consumers, suppliers, government and society. Managers in practice may, thus, perceive their role as reconciling conflicting objectives of stakeholders. This stakeholders' view of managers' role may compromise with the objective of SWM.

Shareholders continuously monitor modern companies that would help them to restrict managers' freedom to act in their own self-interest at the cost of shareholders. Employees, creditors, customers and government also keep an eye on managers' activities. Thus, the possibility of managers pursuing exclusively their own personal goals is reduced. Managers can survive only when they are successful; and they are successful when they manage the company better than someone else. Every group connected with the company will, however, evaluate management success from the point of view of the fulfilment of its own objective. The survival of management will be threatened if the objective of any of these groups remains unfulfilled. In reality, the wealth of shareholders in the long run could be maximized only when customers and employees, along with other stakeholders of a firm, are fully satisfied. The wealth maximization objective may be generally in harmony 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.²¹ There can, however, still arise situations where a conflict may occur between the shareholders' and managers' goals. Finance theory prescribes that under such situations, shareholders wealth maximization goal should have precedent over the goals of other stakeholders.

The conflict between the interests of shareholders and managers is referred to as **agency problem** and it results into agency costs. **Agency costs** include the less than optimum share value for shareholders and costs incurred by them to monitor the actions of managers and control their behaviour. The agency problems vanish when managers own the company. Thus, one way to mitigate the agency problems is to give ownership rights through stock options to managers. Shareholders can also offer attractive monetary and non-monetary incentives to managers to act in their interests. A close monitoring by other stakeholders, board of directors and outside analysts also may help in reducing the agency problems. In more capitalistic societies such as USA and UK, the takeovers and acquisitions are used as means of disciplining managers.

NOTES

Check Your Progress

12. When could an agency problem arise while managing a business?
13. What could be the adverse results of an agency problem?

1.7 FINANCIAL GOAL AND FIRM'S MISSION AND OBJECTIVES

NOTES

In SWM, wealth is defined in terms of wealth or value of the shareholders' equity. This basis of the theory of financial management is the same as that of the classical theory of the firm: maximization of owners' welfare. In the professionally managed firms of our times, managers are the agents of owners and act on their behalf.

SWM is a criterion for financial decisions, and therefore, valuation models provide the basic theoretical and conceptual framework. Is wealth maximization the *objective of the firm*? Does a firm exist with the sole objective of serving the interests of owners? Firms do exist with the primary objective of maximizing the welfare of owners, but, in operational terms, they always focus on the satisfaction of its customers through the production of goods and services needed by them. As Drucker puts it:²²

'What is our business is not determined by the producer, but by the consumer. It is not defined by the company's name, statutes or articles of incorporation, but by the want the consumer satisfies when he buys a product or a service. The question can therefore be answered only by looking at the business from the outside, from the point of view of the customer and the market.'

Firms in practice state their vision, mission and values in broad terms, and are also concerned about technology, leadership, productivity, market standing, image, profitability, financial resources, employees' satisfaction etc. For example, BHEL, a large Indian company with sales of ₹ 72.87 billion (₹ 7,287 crore),²³ net assets of ₹ 92.97 billion (₹ 9,297 crore) and a profit after tax of ₹ 4.68 billion (₹ 468 crore) for the year 2001–02 and employing 47,729 employees states its multiple objectives in terms of leadership, growth, profitability, consumer satisfaction, employees needs, technology and image (see Exhibit 1.1). The stated financial goals of the firm are: (a) sales growth; (b) reasonable return on capital; and (c) internal financing.

Objectives vs. decision criteria: Objectives and decision criteria should be distinguished. Wealth maximization is more appropriately a *decision criterion*, rather than an *objective or a goal*.²⁴ **Goals or objectives** are missions or basic purposes – *raison d'être* of a firm's existence. They direct the firm's actions. A firm may consider itself a provider of high technology, a builder of electronic base, or a provider of best and cheapest transport services. The firm designs its **strategy** around such basic objectives and accordingly, defines its markets, products and technology. To support its strategy, the firm lays down **policies** in the areas of production, purchase, marketing, technology, finance and so on.²⁵

The first step in making a decision is to see that it is consistent with the firm's strategy and passes through the policy screening. The shareholders' wealth maximization is the second-level criterion ensuring that the decision meets the minimum standard of the economic performance. It is important to note that the management is not only the *agent* of owners, but also *trustee* for various stakeholders (constituents) of an economic unit. It is the responsibility of the management to harmonise the interests of owners with that of the employees, creditors, government, or society. In the final decision-making, the judgment of management plays the crucial role. The wealth maximization criterion would simply indicate whether an action is economically viable or not.

Check Your Progress

14. State the financial goals of a firm.
15. Which is the first step in making a decision?

1.8 ORGANIZATION OF THE FINANCE FUNCTIONS

The vital importance of the financial decisions to a firm makes it imperative to set up a sound and efficient organization for the finance functions. The ultimate responsibility of carrying out the finance functions lies with the top management. Thus, a department to organize financial activities may be created under the direct control of the board of directors. The board may constitute a finance committee. The executive heading the finance department is the firm's **chief finance officer** (CFO), and he or she may be known by different designations. The finance committee or CFO will decide the major financial policy matters, while the routine activities would be delegated to lower levels. For example, at BHEL a director of finance at the corporate office heads the finance function. He is a member of the board of directors and reports to the chairman and managing director (CMD). An executive director of finance (EDF) and a general manager of finance (GMF) assist the director of finance. EDF looks after funding, budgets and cost, books of accounts, financial services and cash management. GMF is responsible for internal audit and taxation.

The reason for placing the finance functions in the hands of top management may be attributed to the following factors: *First*, financial decisions are crucial for the survival of the firm. The growth and development of the firm is directly influenced by the financial policies. *Second*, the financial actions determine solvency of the firm. At no cost can a firm afford to threaten its solvency. Because solvency is affected by the flow of funds, which is a result of the various financial activities, top management being in a position to coordinate these activities retains finance functions in its control. *Third*, centralisation of the finance functions can result in a number of economies to the firm. For example, the firm can save in terms of interest on borrowed funds, can purchase fixed assets economically or issue shares or debentures efficiently.

1.8.1 Status and Duties of Finance Executives

The exact organization structure for financial management will differ across firms. It will depend on factors such as the size of the firm, nature of the business, financing operations, capabilities of the firm's financial officers and most importantly, on the financial philosophy of the firm. The designation of the chief financial officer (CFO) would also differ within firms. In some firms, the financial officer may be known as the financial manager, while in others as the vice-president of finance or the director of finance or the financial controller. Two more officers—**treasurer** and **controller**—may be appointed under the direct supervision of CFO to assist him or her. In larger companies, with modern management, there may be vice-president or director of finance, usually with both controller and treasurer reporting to him.²⁶

Figure 1.3 illustrates the financial organization of a large (hypothetical) business firm. It is a simple organization chart, and as stated earlier, the exact organization for a firm will depend on its circumstances. Figure 1.3 reveals that the finance function is one of the major functional areas, and the financial manager or director is under the control of the board of directors. Figure 1.4 shows the organization of the finance function of a large, multi-divisional Indian company.

The CFO has both line and staff responsibilities. He or she is directly concerned with the financial planning and control. He or she is a member of the top management, and he or she is closely associated with the formulation of policies and making decisions

NOTES

for the firm. The treasurer and controller, if a company has these executives, would operate under CFO's supervision. He or she must guide them and others in the effective working of the finance department.

NOTES

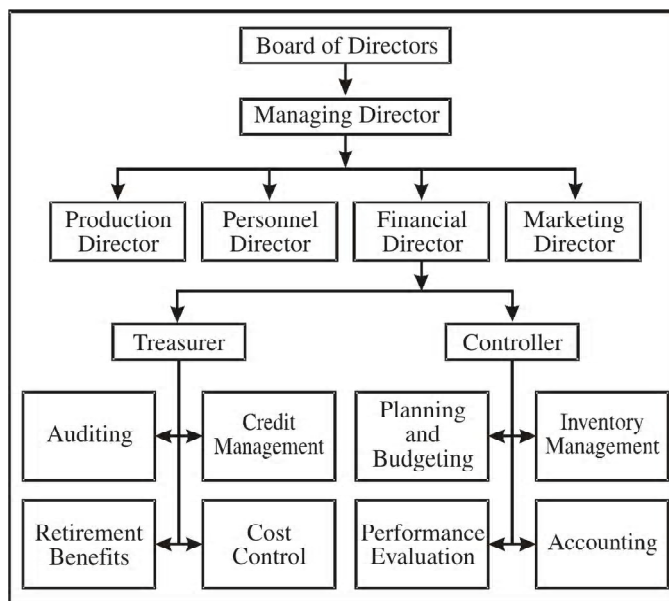


Fig. 1.3 Organization of Finance Function

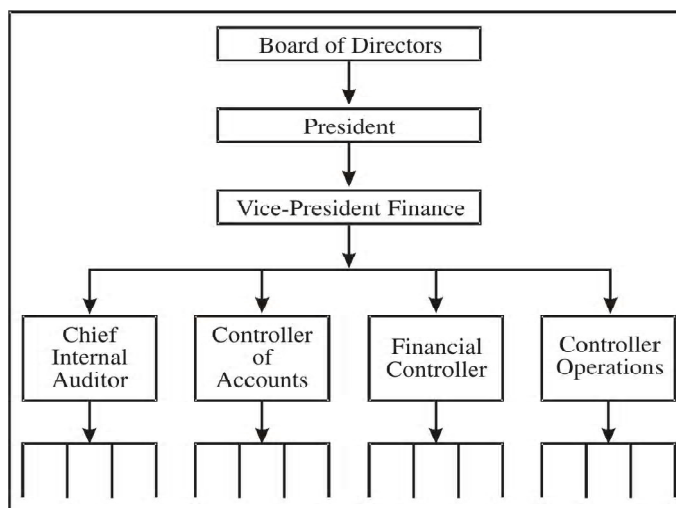


Fig. 1.4 Organization for Finance Function in a Multi-divisional Company

The main function of the treasurer is to manage the firm's funds. His or her major duties include forecasting the financial needs, administering the flow of cash, managing credit, floating securities, maintaining relations with financial institution and protecting funds and securities. On the other hand, the functions of the controller relate to the management and control of assets. His or her duties include providing information to formulate accounting and costing policies, preparation of financial reports, direction of internal auditing, budgeting, inventory control, taxes etc. It may be stated that the controller's functions concentrate the asset side of the balance sheet, while treasurer's functions relate to the liability side.

1.8.2 Controller's and Treasurer's Functions in the Indian Context

The controller and the treasurer are essentially American terms. Generally speaking, the American pattern of dividing the financial executive's functions into controllership and treasurership functions is not being widely followed in India. We do have a number of companies in India having officers with the designation of the controller, or the financial controller. The controller or the financial controller in India, by and large, performs the functions of a chief accountant or management accountant. The officer with the title of treasurer can also be found in a few companies in India.

The controllership functions, as stated by the Financial Executives' Institute of the USA, can prove to be useful under the Indian context. But presently the **company secretary** in India performs some of these duties. His or her duties, for example, include asset control and protection, maintaining records and preparing reports and government reporting. The economic appraisal function is generally performed at the top level in India. Some companies do have separate economics and statistical departments for this purpose. Some other functions, such as internal audit, can be brought within the fold of the controllership functions, if this concept is developed in the Indian context.

It should be realised that the financial controller *does not* control finances; he or she develops, uses and interprets information—some of which will be financial in nature—for management control and planning. For this reason, the financial controller may simply be called as the controller. Management of finance or money is a separate and important activity. Traditionally, the accountants have been involved in managing money in India. But the difference in managing money resources and information resources should be appreciated.

In the American business, the management of finance is treated as a separate activity and is being performed by the treasurer. The title of the treasurer has not found favour in India to the extent the controller has. The company secretary in India discharges some of the functions performed by the treasurer in the American context. Insurance coverage is an example in this regard. The function of maintaining relations with investors (particularly shareholders) may now assume significance in India because of the development in the Indian capital markets and the increasing awareness among investors.

The general title, financial manager or finance director, seems to be more popular in India. This title is also better than the title of treasurer since it conveys the functions involved. The main function of the financial manager in India should be the management of the company's funds. The financial duties may often be combined with others. But the significance of not combining the financial manager's duties with others should be realised. The managing of funds—a very valuable resource—is a business activity requiring extraordinary skill on the part of the financial manager. He or she should ensure the optimum use of money under various constraints. He or she should, therefore, be allowed to devote his or her full energy and time in managing the money resources only.

1.9 SUMAMRY

- The finance functions can be divided into three broad categories: (1) investment decision, (2) financing decision, and (3) dividend decision. In other words, the firm decides how much to invest in short-term and long-term assets and how to raise the required funds.

NOTES

Check Your Progress

16. What are the major roles that the Chief Finance Officer (CFO) of a firm is expected to play in today's business environment?
17. State the main function of a treasurer.

NOTES

- In making financial decisions, the financial manager should aim at increasing the value of the shareholders' stake in the firm. This is referred to as the principle of shareholders' wealth maximization (SWM).
- Wealth maximization is superior to profit maximization since wealth is precisely defined as net present value and it accounts for time value of money and risk.
- Shareholders and managers have the principal-agent relationship. In practice, there may arise a conflict between the interests of shareholders and managers. This is referred to the agency problem and the associated costs are called agency costs. Offering ownership rights (in the form of stock options) to managers can mitigate agency costs.
- The financial manager raises capital from the capital markets. He or she should therefore know how the capital markets function to allocate capital to the competing firms and how security prices are determined in the capital markets.
- Most companies have only one chief financial officer (CFO). But a large company may have both a treasurer and a controller, who may or may not operate under CFO.
- The treasurer's function is to raise and manage company funds while the controller oversees whether funds are correctly applied. A number of companies in India either have a finance director or a vice-president of finance as the chief financial officer.

1.10 KEY TERMS

- **Bond:** A bond or a debenture is a certificate acknowledging the amount of money lent by a bondholder to the company.
- **Financial assets:** Financial assets, also called securities, are financial papers or instruments such as shares and bonds or debentures.
- **Opportunity cost of capital:** It is the expected rate of return that an investor could earn by investing his or her money in financial assets of equivalent risk.
- **Profit planning:** It refers to the operating decisions in the areas of pricing, costs, volume of output and the firm's selection of product lines.
- **Risk-free rate:** It is a rate obtainable from a default-risk free government security.

1.11 ANSWERS TO 'CHECK YOUR PROGRESS'

1. Financial assets like shares and bonds can be bought or sold more easily. Real assets like plant and machinery, building etc. are not as liquid as financial assets are.
2. Mostly equity funds consisting of ordinary shares and undistributed profits (retained earnings) but also preference shares.
3. By issuing new shares to the general public as well as by issuing new shares to existing shareholders which are known as rights shares.
4. A firm borrows money from lenders; they are not owners of the business. There are three reasons for preferring borrowed funds: (1) Unlike dividends on shareholder funds, the amount of interest paid on borrowed funds by a firm saves taxes as it is treated as a deductible expense while computing income tax payable.

by a firm. (2) The shareholder return will be higher if the interest rate on borrowed funds is less than return from assets or business. (3) It is relatively easy to raise borrowed funds from a financial institution or bank than issuing equity funds.

5. The main areas of financial decision making are (1) the investment decision (or capital budgeting decision), (2) the financing decision (or capital structure decision), (3) the dividend decision (or profit allocation decision) and (4) the liquidity decision (or working capital management decision).
6. The opportunity cost of capital is the expected rate of return that an investor could earn by investing his or her money in financial assets of equivalent risk.
7. A finance manager is responsible for carrying out the firm's finance functions. This includes raising funds as well as allocation of funds in an efficient manner. He is also part of the profit planning process.
8. Profit planning refers to the operating decisions in the areas of pricing, costs, volume of output and the firm's selection of product lines.
9. The main financial goal of a firm is to create value for shareholders by maximizing the wealth of shareholders.
10. This is because measures like profits after taxes and earnings per share ignore timing of returns and also ignore risks. The timing of returns is important as the time value of money changes depending on when the value of benefits is received. Further, the streams of benefits may possess different degrees of uncertainty.
11. Risk-free rate is a rate obtainable from a default-risk free government security.
12. An agency problem may arise when managers stop acting in the best interests of shareholders and start pursuing their own goals.
13. An agency problem will result in agency costs. These costs include lowering of shareholder value as well as costs incurred by shareholders to monitor the actions of managers.
14. The stated financial goals of the firm are: (a) sales growth; (b) reasonable return on capital; and (c) internal financing.
15. The first step in making a decision is to see that it is consistent with the firm's strategy and passes through the policy screening.
16. The CFO, heading the finance function of a company, is often a member of the Board of Directors and reports to the Chairman and Managing Director of the Company. Typically, the CFO supervises the work of the Treasurer and the Controller, who in turn look after various functional areas.
17. The main function of the treasurer is to manage the firm's funds. His or her major duties include forecasting the financial needs, administering the flow of cash, managing credit, floating securities, maintaining relations with financial institution and protecting funds and securities.

NOTES

1.12 QUESTIONS AND EXERCISES

Short-Answer Questions

1. Distinguish between:
 - (a) Tangible and intangible real assets
 - (b) Preference and ordinary shares

NOTES

2. Write a short note financial procedures and systems.
3. What are the limitations of profit maximization?
4. Write a short note on risk-return trade off.
5. Distinguish between objective and decision criteria.

Long-Answer Questions

1. Define the scope of financial management. What role should the financial manager play in a modern enterprise?
2. How does the 'modern' financial manager differ from the 'traditional' financial manager? Does the 'modern' financial manager's role differ for the large diversified firm and the small to medium size firm?
3. '... the function of financial management is to review and control decisions to commit or recommit funds to new or ongoing uses. Thus, in addition to raising funds, financial management is directly concerned with production, marketing, and other functions within an enterprise whenever decisions are made about the acquisition or destruction of assets' (Ezra Solomon). Elucidate.
4. 'The profit maximization is not an operationally feasible criterion'. Do you agree? Illustrate your views.
5. In what ways is the wealth maximization objective superior to the profit maximization objective? Explain.
6. How should the finance function of an enterprise be organized? What functions does the financial officer perform?
7. Should the titles of controller and treasurer be adopted under the Indian context? Would you like to modify their functions in view of the company practices in India? Justify your opinion.
8. When can there arise a conflict between shareholders' and managers' goals? How does the wealth maximization goal take care of this conflict?

1.13 FURTHER READING

- Pandey, IM. 2009. *Financial Management*. India: Vikas Publishing Pvt Ltd.
- Kuchal, SC. 1999. *Financial Management: An Analytical and Conceptual Approach*. India: Chaitanya Publishing house.
- Horne Van, C. James. 2001. *Financial Management and Policy*. New Delhi: Prentice Hall.

Endnotes

1. Robichek, A., *Financial Research and Management Decision*, John Wiley, 1967, p. 6.
2. Solomon, Ezra, *The Theory of Financial Management*, Columbia University Press, 1969, p. 3.
3. Different titles are used for the persons performing the finance functions. The title, financial manager, is more popular and easily understood. A discussion of the labels of financial executives follows later in this unit.
4. For a detailed discussion, see Archer, S.M. and D'Ambrosio; S.A., *Business Finance: Theory and Practice*, Macmillan, 1966, Unit 1.
5. Solomon, *op. cit.*, p. 5.

NOTES

6. *Ibid.*, p. 2.
7. Solomon, *op. cit.*, pp. 8–9.
8. Mao, James C.T., *Quantitative Analysis of Financial Decisions*, Macmillan, 1969, p. 4.
9. Solomon, Ezra and Pringle John J., *An Introduction to Financial Management*, Prentice-Hall of India, 1978, pp. 6–7.
10. *Ibid.*
11. Adam Smith, *The Wealth of Nations*, Modern Library, 1937, p. 423, quoted in Solomon and Pringle, *op. cit.*
12. Solomon, *op. cit.*
13. Anthony, Robert B., The Trouble with Profit Maximization, *Harvard Business Review*, 38, (Nov.–Dec. 1960), pp. 126–34.
14. Solomon and Pringle, *op. cit.*, pp. 8–9.
15. Solomon, *op. cit.*, p. 19.
16. Porterfield, James C.T., *Investment Decision and Capital Costs*, Prentice-Hall, 1965.
17. Solomon, *op. cit.*, p. 22.
18. The net present value or wealth can be defined more explicitly in the following way:

$$NPV = W = \frac{C_1}{(1+k)} + \frac{C_2}{(1+k)^2} + \dots + \frac{C_n}{(1+k)^n} - C_0 = \sum_{t=1}^n \frac{C_t}{(1+k)^t} - C_0$$

where $C_1, C_2, \dots$ represent the stream of cash flows (benefits) expected to occur if a course of action is adopted, C_0 is the cash outflow (cost) of that action and k is the appropriate discount rate (opportunity cost of capital) to measure the quality of C 's; k reflects both timing and risk of benefits, and W is the net present value or wealth which is the difference between the present value of the stream of benefits and the initial cost. The firm should adopt a course of action only when W is positive, i.e. when there is net increase in the wealth of the firm. This is a very simple model of expressing wealth maximization principle. A complicated model can assume capital investments to occur over a period of time and k to change with time.

19. Solomon, *op. cit.*, p. 20.
20. Donaldson, G., *Managing Corporate Wealth: The Operations of a Comprehensive Financial Goals System*, New York : Praeger, 1984.
21. For a detailed discussion, see Solomon, *op. cit.*
22. Drucker, Peter, *The Practice of Management*, Pan Books, 1968, p. 67.
23. 1 crore = 10 million; 10 lakh = 1 million; 1 lakh = 100 thousand.
24. Some people make a difference between objectives and goals. We use them interchangeably here.
25. Solomon and Pringle, *op. cit.*
26. Cohen, J.B. and Robbins, S.M., *The Financial Manager*, Harper and Row, 1966, pp. 11–12.

UNIT 2 FINANCIAL FORECASTING

Structure

- 2.0 Introduction
- 2.1 Unit Objectives
- 2.2 Planning for Funds Requirement
- 2.3 Preparation of Cash Budget
- 2.4 Pro Forma Income Statement
- 2.5 Balance Sheet
- 2.6 Summary
- 2.7 Key Terms
- 2.8 Answers to 'Check Your Progress'
- 2.9 Questions and Exercises
- 2.10 Further Reading
- Endnotes/References

NOTES

2.0 INTRODUCTION

Cash is the most important current asset for the operations of any firm. It is the basic input needed to keep the business running and is also the ultimate output expected to be realized by selling the service or product manufactured by the firm. The firm should keep a sufficient amount of cash at all times. Cash shortage will disrupt the firm's manufacturing operations while excessive cash will simply remain idle, without contributing anything towards the firm's profitability. Hence, a major function of the financial manager is to maintain a sound cash position. Large holding of current assets, especially cash, strengthens the firm's liquidity position (and reduces riskiness), as well as reduces the overall profitability. Thus, a risk-return trade-off is involved in holding current assets.

The basis for financial planning, analysis and decision making is the financial information. Financial information is needed to predict, compare and evaluate the firm's earning ability. It is also required to aid in economic decision making—investment and financing decision making. The financial information of an enterprise is contained in the financial statements or accounting reports. Three basic financial statements of great significance to owners, management and investors are balance sheet, profit and loss account and cash flow statement.

2.1 UNIT OBJECTIVES

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

- Explain the importance of planning required for funds
- Discuss the preparation of cash budget
- Understand the meaning of pro forma income statement
- Discuss the significance of a balance sheet

2.2 PLANNING FOR FUNDS REQUIREMENT

NOTES

Cash Planning

Cash flows are inseparable part of the business operations of firms. A firm needs cash to invest in inventory, receivable and fixed assets and to make payment for operating expenses in order to maintain growth in sales and earnings. It is possible that the firm may be making adequate profits but may suffer from the shortage of cash as its growing needs may be consuming cash very fast. The 'cash poor' position of the firm can be corrected if its cash needs are planned in advance. At times, a firm can have excess cash with it if its cash inflows exceed cash outflows. Such excess cash may remain idle. Again, such excess cash flows can be anticipated and properly invested if cash planning is resorted to. **Cash planning** is a technique to plan and control the use of cash. It helps to anticipate the future cash flows and needs of the firm and reduces the possibility of idle cash balances (which lowers firm's profitability) and cash deficits (which can cause the firm's failure).

Cash planning protects the financial condition of the firm by developing a projected cash statement from a forecast of expected cash inflows and outflows for a given period. The forecasts may be based on the present operations or the anticipated future operations. Cash plans are very crucial in developing the overall operating plans of the firm.

Cash planning may be done on daily, weekly or monthly basis. The period and frequency of cash planning generally depends upon the size of the firm and philosophy of management. Large firms prepare daily and weekly forecasts. Medium-size firms usually prepare weekly and monthly forecasts. Small firms may not prepare formal cash forecasts because of the non-availability of information and small-scale operations. However, if the small firms prepare cash projections, it is done on monthly basis. As a firm grows and business operations become complex, cash planning becomes inevitable for its continuing success.

2.3 PREPARATION OF CASH BUDGET

Cash budget is the most significant device to plan for and control cash receipts and payments. A **cash budget** is a summary statement of the firm's expected cash inflows and outflows over a projected time period. It gives information on the timing and magnitude of expected cash flows and cash balances over the projected period. This information helps the financial manager to determine the future cash needs of the firm, plan for the financing of these needs and exercise control over the cash and liquidity of the firm.¹

The time horizon of a cash budget may differ from firm to firm. A firm whose business is affected by seasonal variations may prepare monthly cash budgets. Daily or weekly cash budgets should be prepared for determining cash requirements if cash flows show extreme fluctuations. Cash budgets for a longer intervals may be prepared if cash flows are relatively stable.

Cash forecasts are needed to prepare cash budgets. Cash forecasting may be done on short or long-term basis. Generally, forecasts covering periods of one year or less are considered short-term and those extending beyond one year are considered long-term.

Check Your Progress

1. Define cash planning.
2. What are the factors on which the period and frequency of cash planning depends?

Short-term Cash Forecasts

It is comparatively easy to make short-term cash forecasts. The important functions of carefully developed short-term cash forecasts are:

- To determine operating cash requirements
- To anticipate short-term financing
- To manage investment of surplus cash

Short-run cash forecasts serve many other purposes. For example, multi-divisional firms use them as a tool to coordinate the flow of funds between their various divisions as well as to make financing arrangements for these operations. These forecasts may also be useful in determining the margins or minimum balances to be maintained with banks. Still other uses of these forecasts are:²

- Planning reductions of short and long-term debt
- Scheduling payments in connection with capital expenditures programmes
- Planning forward purchases of inventories
- Checking accuracy of long-range cash forecasts
- Taking advantage of cash discounts offered by suppliers
- Guiding credit policies

Short-term Forecasting Methods

Two most commonly used methods of short-term cash forecasting are:

- Receipt and disbursements method
- Adjusted net income method

The receipts and disbursements method is generally employed to forecast for limited periods, such as a week or a month. The adjusted net income method, on the other hand, is preferred for longer durations ranging between a few months to a year. Both methods have their pros and cons. The cash flows can be compared with budgeted income and expense items if the receipts and disbursements approach is followed. On the other hand, the adjusted income approach is appropriate in showing a company's working capital and future financing needs.

Illustration 2.1: Short-term Cash Forecasting³

Suppose that a firm makes 80 per cent of its sales on a 30-day credit. Its actual experience shows that 80 per cent of debtors are realized after one month and 20 per cent after two months after goods are sold. With this information, the expected cash receipts from sales can be calculated if sales forecast are available. For example, sale receipts for January, February, March and April are calculated in Table 2.1 on the basis of assumed sales forecasts.

Table 2.1 Estimated Sales Receipts

(₹ '000)

	Actual			Forecast		
	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.
Total sales	500	600	550	660	700	1,000
Credit sales (80%)	400	480	440	528	560	800
Collections						
One month	—	320	384	352	422	448
Two months	—	—	80	96	88	106

NOTES

Total collections	464	448	510	554
Cash sales	110	132	140	200
Total sales receipts	574	580	650	754

NOTES

It can be seen from Table 2.1 that total sales for January are estimated to be ₹ 550,000, of which 80 percent (i.e., ₹ 440,000) are credit sales and 20 percent (i.e., ₹ 110,000) are cash sales. The 80 percent of credit sales or ₹ 352,000 are expected to be received in February and 20 percent or ₹ 88,000 is expected to be realized in March. Sales of other months are also shown in the same way.

It can easily be noted that cash receipts from sales will be affected by changes in sales volume and the firm's credit policy. To develop a realistic cash budget, these changes should be accounted for. If the demand for the firm's products slackens, sales will fall and the average collection period is likely to be longer which increases the chances of bad debts. In preparing cash budget, account should be taken of sales discounts, returns, allowances and bad debts as they reduce the amount of cash collections from debtors.

Non-operating cash inflows include sale of old assets and dividend and interest income. The magnitude of these items is generally small. When internally generated cash flows are not sufficient, the firm resorts to external sources. Borrowings and issuance of securities are external financial sources. These constitute financial cash inflows.

The next step in the preparation of a cash budget is the estimate of cash outflows. Cash outflows include: (i) operating outflows—cash purchases, payments of payables, advances to suppliers, wages and salaries and other operating expenses (ii) capital expenditures (iii) contractual payments—repayment of loan and interest and tax payments and (iv) discretionary payments—ordinary and preference dividend. In case of credit purchases, a time lag will exist for cash payments. This will depend on the credit terms offered by the suppliers.

It is relatively easy to predict the expenses of the firm over short run. Firms usually prepare capital expenditure budgets. Therefore, capital expenditures are predictable for the purposes of cash budget. Similarly, payments of dividend do not fluctuate widely and are paid on specific dates. Cash outflow can also occur when the firm repays its long-term debt. Such payments are generally planned and therefore, there is no difficulty in predicting them.

Once the forecasts for cash receipts and payments have been developed, they can be combined to obtain the net cash inflow or outflow for each month. The net balance for each month would indicate whether the firm has excess cash or deficit. The peak cash requirements would also be indicated. If the firm has a policy of maintaining some minimum cash balance, arrangements must be made to maintain this minimum balance in periods of deficit. The cash deficit can be met by borrowing from banks. Alternatively, the firm can delay its capital expenditures or payments to creditors or postpone payment of dividends.

One of the significant advantages of cash budget is to determine the net cash inflow or outflow so that the firm is enabled to arrange finances. However, the firm's decision for appropriate sources of financing should depend upon factors such as cost and risk. Cash budget helps a firm to manage its cash position. It also helps to utilize ideal funds in better ways. On the basis of cash budget, the firm can decide to invest surplus cash in marketable securities and earn profits.

The preparation of a cash budget is explained in Illustration 2.1.

Illustration 2.2: Preparing cash budget

On the basis of the following information, prepare a cash budget for Marshall Manufacturing Company for the first six months of 2004:

1. Prices and costs are assumed to remain unchanged
2. Credit sales are 75 per cent of total sales
3. The 60 per cent of credit sales are collected after one month, 30 per cent after two months and 10 per cent after three months
4. Actual and forecast sales are as follows:

<i>Actual</i>	<i>(₹'000)</i>	<i>Forecast</i>	<i>(₹'000)</i>
Oct. 2003	120,000	Jan. 2004	60,000
Nov. 2003	140,000	Feb. 2004	80,000
Dec. 2003	160,000	Mar. 2004	80,000
		Apr. 2004	120,000
		May 2004	100,000
		June 2004	80,000
		July 2004	120,000

5. The company expects a profit margin of 20 per cent
6. Anticipated sales of each month are purchased and paid in the preceding month
7. The anticipated operating expenses are as follows:

	<i>(₹'000)</i>		<i>(₹'000)</i>
Jan.	12,000	Apr.	20,000
Feb.	16,000	May	16,000
Mar.	20,000	June	14,000

8. Interest on 12 per cent debenture ₹ 100 million is to be paid in each quarter
9. An advance tax of ₹ 20 million is due in April
10. A purchase of equipment of ₹ 12 million is to be made in June
11. The company has a cash balance of ₹ 40 million at 31 December 2004, which is the minimum balance to be maintained. Funds can be borrowed in multiples of ₹ 2 million on a monthly basis at 18 per cent annum
12. Interest is payable on the first of the month after the borrowing
13. Rent is ₹ 0.80 million per month

In Table 2.2, cash inflows are estimated in accordance with the company's total sales and collection policy. For example, of the total sales of ₹ 60 million for January, 25 per cent (₹ 15 million) are collected as cash sales in January: 60 per cent of credit sales (60 per cent of ₹ 45 million = ₹ 27 million) are collected in February, 30 per cent (₹ 13.5 million) in March and remaining 10 per cent (₹ 4.5 million) in April. Similarly, the sales of other months are broken.

NOTES

Table 2.2 Cash Budget

NOTES

	Actual 2003			Forecast 2004					
	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June
A. Cash Receipts (₹'000)									
Total sales	120,000	140,000	160,000	60,000	80,000	80,000	120,000	100,000	80,000
Credit sales	90,000	105,000	120,000	45,000	60,000	60,000	90,000	75,000	60,000
Cash sales collection	30,000	35,000	40,000	15,000	20,000	20,000	30,000	25,000	20,000
1 month 60%	–	54,000	63,000	72,000	27,000	36,000	36,000	54,000	45,000
2 months 30%	–	–	27,000	31,500	36,000	13,500	18,000	18,000	27,000
3 months 10%	–	–	–	9,000	10,500	12,000	4,500	6,000	6,000
Total receipt (A)				127,500	93,500	81,500	88,500	103,000	98,000
B. Cash Payments (₹'000)									
Purchases				64,000	64,000	96,000	80,000	64,000	96,000
Rent				800	800	800	800	800	800
Operating exps.				12,000	16,000	20,000	20,000	16,000	14,000
Equipment				–	–	–	–	–	12,000
Interest				–	–	3,000	–	–	3,000
Advance tax				–	–	–	20,000	–	–
Total payment (B)				76,800	80,800	119,800	120,800	80,800	125,800
C. Cash Balance (₹'000)									
Net cash balance (A) – (B)				50,700	12,700	(38,300)	(32,300)	22,200	(27,800)
Total cash				90,700	103,400	65,100	32,800	63,000	27,080
Beginning of month borrowings*				–	–	–	8,000	–	14,000
Interest on borrowings				–	–	–	–	(120)	–
Repayment of borrowings				–	–	–	–	(8,000)	–
Total end of month cash balance				90,700	103,400	65,100	40,800	54,880	41,080

* To maintain minimum cash balance of ₹ 40,000, the company will borrow.

Section B of Table 2.2 shows all anticipated cash payments. Anticipated sales for each month are purchased and paid in the preceding month. As the profit margin is 20 per cent, the cost of purchases will be 80 per cent of sales. Thus, for the month of February, purchases equal to 80 per cent of its anticipated sales of ₹ 80 million (i.e., ₹ 64 million purchases) will be made and paid in January. Other items of cash outflows shown are rent, wages and salaries, taxes, capital expenditures and interest on debt. The quarterly payment of interest will be made in March and June. In order to maintain a minimum cash balance of ₹ 40 million, ₹ 8 million will have to be borrowed in the month of April. Interest at 18 per cent on this amount will be paid only in May.

The difference between total receipts and total payments gives us the net cash flow. To this is added the beginning of month's balance to get the total cash balance in a particular month. In April the total balance is ₹ 32.8 million, therefore, to maintain the minimum requirements of ₹ 40 million a borrowing of ₹ 8 million will be made. In May there is a cash balance of ₹ 62.88 million after paying interest of ₹ 0.12 million, therefore, ₹ 8 million can be repaid without impairing the minimum cash balance requirement. Again, ₹ 14 million will have to be borrowed in June to maintain cash balance at ₹ 40 million.

The virtues of the receipt and payment methods are:

- It gives a complete picture of all the items of expected cash flows.
- It is a sound tool of managing daily cash operations.

This method, however, suffers from the following limitations:

- Its reliability is reduced because of the uncertainty of cash forecasts. For example, collections may be delayed, or unanticipated demands may cause large disbursements.
- It fails to highlight the significant movements in the working capital items.

NOTES

Sensitivity Analysis

The estimates of cash flows may be considered based on expected or most probable values. In practice, many alternatives are possible because of uncertainty. One useful method of getting insights about the variability of cash flows is **sensitivity analysis**. A firm can, for example, prepare cash budget based on three forecasts: optimistic, most probable and pessimistic. On the basis of its experience, the firm would know that sales could decrease at the most by 20 per cent under unfavourable conditions as compared to the most probable estimate. Thus, cash budget can be prepared under three sales conditions. Knowledge of the outcome of extreme expectations will help the firm to be prepared with contingency plans. A cash budget prepared under worst conditions will prove to be useful to the management to face those circumstances.

Long-term cash Forecasting

Long-term cash forecasts are prepared to give an idea of the company's financial requirements in the distant future. They are not as detailed as the short-term forecasts are. Once a company has developed long-term cash forecast, it can be used to evaluate the impact of, say, new product developments or plant acquisitions on the firm's financial condition three, five, or more years in the future. The major uses of the long-term cash forecasts are:⁴

- It indicates as company's future financial needs, especially for its working capital requirements.
- It helps to evaluate proposed capital projects. It pinpoints the cash required to finance these projects as well as the cash to be generated by the company to support them.
- It helps to improve corporate planning. Long-term cash forecasts compel each division to plan for future and to formulate projects carefully.

Long-term cash forecasts may be made for two, three or five years. As with the short-term forecasts, company's practices may differ on the duration of long-term forecasts to suit their particular needs.

The short-term forecasting methods, i.e., the receipts and disbursements method and the adjusted net income method, can also be used in long-term cash forecasting. Long-term cash forecasting reflects the impact of growth, expansion or acquisitions and it also indicates financing problems arising from these developments.

Managing Cash Collections and Disbursements

Once the cash budget has been prepared and appropriate net cash flow established, the financial manager should ensure that there does not exist a significant deviation between projected cash flows and actual cash flows. To achieve this, cash management efficiency will have to be improved through a proper control of cash collection and disbursement. The twin objectives in managing the cash flows should be to accelerate cash collections as much as possible and to decelerate or delay cash disbursements as much as possible.

NOTES

Accelerating Cash Collections

A firm can conserve cash and reduce its requirements for cash balances if it can speed up its cash collections. The first hurdle in accelerating the cash collection could be the firm itself. It may take a long time to process the invoice. Days taken to get the invoice to buyers adds to order processing delay. In India, yet another problem is with regard to the extra time enjoyed by the buyers in clearing of bills, particularly, the government agencies take time beyond what is allowed by sellers in paying bills. Cash collections can be accelerated by reducing the lag or gap between the time a customer pays bill and the time the cheque is collected and funds become available for the firm's use.

The amount of cheques sent by customer which are not yet collected is called collection or **deposit float**. Within this time gap, the delay is caused by the mailing time, i.e. the time taken by cheque in transit and the processing time, i.e., the time taken by the firm in processing cheque for internal accounting purposes. This also depends on the processing time taken by the bank as well as the inter bank system to get credit in the desired account. The greater the firm's deposit float, the longer the time taken in converting cheques into usable funds. In India, these floats can assume sizeable proportions as cheques normally take a longer time to get realized than in most countries.⁵ An efficient financial manager will attempt to reduce the firm's deposit float by speeding up the mailing, processing and collection times. How can this be achieved? A firm can use decentralized collection system and lock-box system to speed up cash collections and reduce deposit float.

Illustration 2.3

XY Ltd. has a ₹ 1.20 lakh balance available in its bank account as well as this is the balance shown in its ledger. XY Ltd. receives a cheque of ₹ 50,000 that it records in its books and deposits in the bank. It will take 3 days for the amount to be credited to XY Ltd's bank account. How much is the deposit (collection) float today?

XY Ltd.'s book balance increases, but its bank balance remains unaltered until ₹ 50,000 get credited. Thus, the float is a negative float of ₹ 50,000:

$$\begin{aligned}\text{Deposit float} &= \text{Balance available in bank} - \text{Balance in books} \\ &= 120,000 - 170,000 = -50,000\end{aligned}$$

Decentralized Collections

A large firm operating over wide geographical areas can speed up its collections by following a decentralized collection procedure. A decentralized collection procedure, called **concentration banking** in USA, is a system of operating through a number of collection centres, instead of a single collection centre centralized at the firm's head office. The basic purpose of the decentralized collections is to minimize the lag between the mailing time from customers to the firm and the time when the firm can make use of the funds. Under decentralized collections, the firm will have a large number of bank accounts operated in the areas where the firm has its branches. All branches may not have the collection centres. The selection of the collection centre will depend upon the volume of billing. The collection centres will be required to collect cheques from customers and deposit in their local bank accounts. The collection centre will transfer funds above some predetermined minimum to a central or **concentration bank account**, generally at the firm's head office, each day. A concentration bank is one where the firm has a major account—usually disbursement account.⁶ Funds can be transferred to a central or

concentration bank by wire transfer or telex or fax or electronic mail. Decentralized collection procedure is, thus, a useful way to reduce float.

Decentralized collection system saves mailing and processing time and, thus, reduces the deposit float and consequently, the financing requirements. For example, suppose a company has credit sales of ₹ 146 crore per year. Its collections will average ₹ 40 lakh per day ($146 \text{ crore} \div 365$). If the company could reduce its mailing and processing time from five days to three days and deposit cheques into the bank two days earlier, outstanding balance would be reduced by ₹ 80 lakh. If the annual borrowing rate was 18 per cent, the company has saved an opportunity cost of ₹ 14.40 lakh on annual basis. Thus, a decentralized collection system results in potential savings which should be compared with the cost of maintaining the system. The system should be adopted only when savings are greater than cost.

NOTES

2.4 PRO FORMA INCOME STATEMENT

A pro-forma income statement is similar to a historical income statement; difference being that it projects the future rather than the past. It is an important tool for planning future business operations. In case it is predicted that there will be a downturn in profitability, one can make operational changes such as decreasing costs or increasing prices before these projections become reality.

Pro forma income statements provide an important benchmark for operating a business. They are used to determine whether expenses will be higher in the first quarter of the year or in the second. They are also used to determine whether sales can be expected to run above average or not; they provide valuable information regarding right choices to be made for business. A pro forma income statement includes revenue, operational expenses and non-operational expenses and Cost of Goods Sold (COGS).

2.5 BALANCE SHEET

Balance sheet is the most significant financial statement. It indicates the financial condition or the state of affairs of a business at a particular moment of time. More specifically, balance sheet contains information about resources and obligations of a business entity and about its owners' interests in the business at a particular point of time. Thus, the balance sheet of a firm prepared on 31 March 2009 reveals the firm's financial position on this specific date. In the language of accounting, balance sheet communicates information about **assets**, **liabilities** and **owner's equity** for a business firm on a specific date. It provides a snapshot of the financial position of the firm at the close of the firm's accounting period.

Assets are valuable economic resources owned by the firm. They embody future benefits and are measured in monetary terms. Assets represent—(a) stored purchasing power (e.g., cash), (b) money claims (e.g., receivables, stock) and (c) tangible and intangible items that can be sold or used in business to generate earnings. Tangible items include land, building, plant, equipment or stocks of materials and finished goods, and all such other items which have physical substance. Intangible items do not have any physical existence, but they are of value to a firm. They include patents, copyrights, trade name or goodwill.

Check Your Progress

3. Define a cash budget.
4. What are the most commonly used short-term forecasting methods?
5. Define deposit float.

NOTES

Assets are classified as—(1) current assets and (2) fixed (long-term) assets. **Current assets**, sometimes called **liquid assets**, are those resources of a firm which are either held in the form of cash or are expected to be converted in cash within the accounting period or the operating cycle of the business. The accounting period is of one-year duration. The **operating cycle** is the time taken to convert the raw materials into finished goods, sell finished goods, and convert receivables (goods sold on credit) into cash. Mostly, operating cycle is equal to or less than the accounting period. Current assets include cash, tradable (marketable) securities, debtors (account receivables) and stock of raw material, work-in-process and finished goods.

Fixed assets are long term in nature; they are held for periods longer than the accounting period. They include **tangible fixed assets** like land, building, machinery, equipment, furniture, etc. These assets are normally recorded at cost. Costs of tangible fixed assets are allocated over their useful lives. The amount so allocated each year is called **depreciation**. Costs of tangible fixed assets are reduced every year by the amount of depreciation. Depreciating an asset is a process of allocating cost and does not involve any cash outlay. **Intangible fixed assets** represent the firm's rights and include patents, copyrights, franchises, trademarks, trade names and goodwill. Costs of intangible fixed assets are **amortized** over their useful lives. In India, the term **gross block** is used for the original cost of total fixed assets. When accumulated depreciation is subtracted from the gross block, the difference is called the **net block**.

Firm's obligations are called **liabilities**. Liabilities represent debts payable in the future by the firm to its lenders and creditors. They represent economic obligations to pay cash or to provide goods or services in some future period. Generally, borrowing money or purchasing goods or services on credit creates liabilities. Examples of liabilities are creditors, bills payable, wages and salaries payable, interest payable, taxes payable, bonds, debentures, borrowing from banks and financial institutions, public deposits etc.

Liabilities are of two types—(1) current liabilities; and (2) long-term (fixed) liabilities. **Current liabilities** are debts payable within an accounting period. Current assets are converted into cash to pay current liabilities. Sometimes new current liabilities may be incurred to liquidate the existing ones. The typical examples of current liabilities are creditors, bills payable, bank overdraft, tax provision (payable), provision for dividends, outstanding expenses and incomes received in advance. **Long-term liabilities** are the obligations or debts payable in a period of time greater than the accounting period. Long-term liabilities usually represent borrowing for a long period of time. They include debentures, bonds, and secured long-term loans from financial institutions.

Owners' equity (or simply equity) is the financial interests of the owners. The owners' interest is *residual* in nature, reflecting the excess of the firm's assets over its liabilities. As liabilities are the claims of outside parties, equity represents owners' claim against the business entity as of the balance sheet date. But the nature of the owners' claim is not the same as that of the creditors. Creditors' claims are defined and have to be met within a specified period. The claim of owners change and the amount payable to them can be determined only when the firm is liquidated. Since assets are recorded at cost, there can be considerable difference between the owners' book claim and the real claim.

Initially, owners' equity arises on account of the funds invested by them. But it changes due to the earnings of the firm and their distribution. The firm's earnings (or losses) do not affect the creditors' claims. Owners' equity will increase when the firm

makes earnings and retains whole or part. If the firm incurs losses, owners' claim will be reduced. In case of joint stock companies, owners are called **shareholders** (or stockholders in USA). Therefore, owners' equity is referred to as **shareholders' equity** or **shareholders' funds**. Shareholders' equity has two parts—(i) paid-up share capital, and (ii) reserves and surplus (retained earnings)—representing undistributed profits. **Paid-up share capital** is the amount of funds directly contributed by the shareholders through purchase of shares. **Reserves and surplus** or **retained earnings** are undistributed (book) profits. Paid-up share capital and reserve and surplus together are called **net worth**.

Summarized Balance Sheet in Practice: Example of GNFC

How do companies present their balance sheet in the published annual report? Table 2.3 gives summarized balance sheet of Gujarat Narmada Valley Fertilizers Company Limited (GNFC) as on 31 March 20X1 and 20X1.

The following significant points may be noted in GNFC's balance sheet for the year 20X1:

- GNFC's sources of funds include shareholders' funds (equity or net worth)—₹ 844.51 crore and loan funds crore (borrowings, both long- and short term)—₹ 845.16. GNFC's capital employed (CE) is ₹ 1,689.67 crore:

$$\begin{aligned}\text{CE} &= \text{Net worth} + \text{Borrowings} \\ &= 844.51 + 845.16 \\ &= \text{Rs } 1,689.67 \text{ crore}\end{aligned}$$

- GNFC's sources of funds do not include current liabilities—₹ 347.21 crore. It has shown net current assets (NCA)—the difference between current assets (CA) and current liabilities (CL)—as application of funds. GNFC's net current assets are ₹ 503.97 crore:

$$\begin{aligned}\text{NCA} &= \text{CA} - \text{CL} \\ &= 851.18 - 347.21 \\ &= \text{Rs } 503.97 \text{ crore}\end{aligned}$$

- GNFC's application of funds includes net fixed assets (NFA), investments, (INVT), net current assets (NCA) and other assets (OA). The total application of funds represents GNFC's net assets of ₹ 1,689.67 crore:

$$\begin{aligned}\text{NA} &= \text{NFA} + \text{INVT} + \text{NCA} + \text{OA} \\ &= 954.82 + 227.07 + 503.97 + 3.81 \\ &= \text{Rs } 1,689.67 \text{ crore}\end{aligned}$$

- GNFC's sources of funds are equal to application of funds. In other words, GNFC's capital employed finances its net assets.

Note that GNFC has contingent liabilities of ₹ 186.20 crore. They appear as a note to the balance sheet. Contingent liabilities are not actual current liabilities; they are liabilities contingent upon the occurrence of some future event.

NOTES

Table 2.3 Gujarat Narmada Valley Fertilizers Company
Balance Sheet as on 31 March

(₹ lakh)

NOTES

	20X1	20X0
SOURCES OF FUNDS		
Shareholders' Funds		
Share Capital	146.48	146.48
Reserves and Surplus	698.03	636.07
Total Shareholders Funds	844.51	782.55
Loan Funds		
Secured Loans	558.22	524.64
Unsecured Loans	286.94	343.52
Total Debt	845.16	868.16
Total Funds	1,689.67	1,650.71
APPLICATION OF FUNDS		
Fixed Assets		
Gross Block	1,724.33	1,660.18
Less: Accumulated Depreciation	903.92	842.71
Net Block	820.41	817.47
Capital Work in Progress	134.41	62.43
Total Net Fixed Assets	954.82	879.90
Investments	227.07	229.72
Current Assets, Loans & Advances		
Inventories	243.10	226.51
Sundry Debtors	235.87	248.25
Cash and Bank Balance	17.50	18.16
Loans and Advances	354.71	338.82
	851.18	831.74
Less: Current Liabilities & Provisions		
Current Liabilities	204.87	167.34
Provisions	142.34	128.29
	347.21	295.63
Net Current Assets	503.97	536.11
Miscellaneous Expenditure	3.81	4.98
Total Assets	1,689.67	1,650.71
Contingent Liabilities	186.20	220.82

Check Your Progress

- What is a pro forma income statement?
- Define a balance sheet.
- What are the two types of assets?
- Define the term liabilities.
- What are the two types of liabilities?

2.6 SUMMARY

- Cash planning is a technique to plan and control the use of cash. It helps to anticipate the future cash flows and needs of the firm and reduces the possibility of idle cash balances (which lowers firm's profitability) and cash deficits (which can cause the firm's failure).
- Cash planning protects the financial condition of the firm by developing a projected cash statement from a forecast of expected cash inflows and outflows for a given period.

- Cash plans are very crucial in developing the overall operating plans of the firm.
- Cash planning may be done on daily, weekly or monthly basis. The period and frequency of cash planning generally depends upon the size of the firm and philosophy of management.
- Cash budget is the most significant device to plan for and control cash receipts and payments. A cash budget is a summary statement of the firm's expected cash inflows and outflows over a projected time period.
- Cash forecasts are needed to prepare cash budgets. Cash forecasting may be done on short or long-term basis.
- It is comparatively easy to make short-term cash forecasts.
- Two most commonly used methods of short-term cash forecasting are—receipt and disbursements method and adjusted net income method.
- It is relatively easy to predict the expenses of the firm over short run. Firms usually prepare capital expenditure budgets. Therefore, capital expenditures are predictable for the purposes of cash budget.
- One of the significant advantages of cash budget is to determine the net cash inflow or outflow so that the firm is enabled to arrange finances.
- One useful method of getting insights about the variability of cash flows is sensitivity analysis.
- Long-term cash forecasts are prepared to give an idea of the company's financial requirements in the distant future. They are not as detailed as the short-term forecasts are.
- The amount of cheques sent by customer which are not yet collected is called collection or deposit float.
- A pro-forma income statement is similar to a historical income statement; difference being that it projects the future rather than the past. It is an important tool for planning future business operations.
- Balance sheet is the most significant financial statement. It indicates the financial condition or the state of affairs of a business at a particular moment of time.
- Assets are valuable economic resources owned by the firm. Assets are classified as— (1) current assets and (2) fixed (long-term) assets.
- Current assets, sometimes called liquid assets, are those resources of a firm which are either held in the form of cash or are expected to be converted in cash within the accounting period or the operating cycle of the business.
- Fixed assets are long term in nature; they are held for periods longer than the accounting period.
- Firm's obligations are called liabilities. Liabilities represent debts payable in the future by the firm to its lenders and creditors.
- Liabilities are of two types: (1) current liabilities; and (2) long-term (fixed) liabilities.
- Current liabilities are debts payable within an accounting period. Current assets are converted into cash to pay current liabilities.
- Long-term liabilities are the obligations or debts payable in a period of time greater than the accounting period.

NOTES

NOTES

- Shareholders' equity has two parts— (i) paid-up share capital, and (ii) reserves and surplus (retained earnings)—representing undistributed profits.
- Paid-up share capital is the amount of funds directly contributed by the shareholders through purchase of shares.
- Reserves and surplus or retained earnings are undistributed (book) profits. Paid-up share capital and reserve and surplus together are called net worth.

2.7 KEY TERMS

- **Cash Planning:** Cash planning is a technique to plan and control the use of cash.
- **Cash budget:** A cash budget is a summary statement of the firm's expected cash inflows and outflows over a projected time period.
- **Balance sheet:** Balance sheet is the most significant financial statement. It indicates the financial condition or the state of affairs of a business at a particular moment of time.
- **Assets:** Assets are valuable economic resources owned by the firm. They embody future benefits and are measured in monetary terms.
- **Liabilities:** Firm's obligations are called liabilities. Liabilities represent debts payable in the future by the firm to its lenders and creditors.

2.8 ANSWERS TO 'CHECK YOUR PROGRESS'

1. Cash planning is a technique to plan and control the use of cash. It helps to anticipate the future cash flows and needs of the firm and reduces the possibility of idle cash balances (which lowers firm's profitability) and cash deficits (which can cause the firm's failure).
2. The period and frequency of cash planning generally depends upon the size of the firm and philosophy of management.
3. A cash budget is a summary statement of the firm's expected cash inflows and outflows over a projected time period.
4. Two most commonly used methods of short-term cash forecasting are:
 - Receipt and disbursements method
 - Adjusted net income method
5. The amount of cheques sent by customer which are not yet collected is called collection or deposit float.
6. A pro-forma income statement is similar to a historical income statement; difference being that it projects the future rather than the past. It is an important tool for planning future business operations.
7. Balance sheet is the most significant financial statement. It indicates the financial condition or the state of affairs of a business at a particular moment of time.
8. Assets are classified as— (1) current assets and (2) fixed (long-term) assets.
9. Firm's obligations are called liabilities. Liabilities represent debts payable in the future by the firm to its lenders and creditors.
10. Liabilities are of two types— (1) current liabilities; and (2) long-term (fixed) liabilities.

2.9 QUESTIONS AND EXERCISES

Short-Answer Questions

1. What is the importance of cash planning?
2. Distinguish between current assets and fixed assets.
3. Distinguish between current and long-term liabilities.
4. What is paid-up-share capital and reserves and surplus or retained earnings?

Long-Answer Questions

1. Distinguish between short-term and long-term forecasting.
2. Discuss the two commonly used short-term forecasting methods. What are the important functions of short-term cash forecasts?
3. What is decentralized collection?

2.10 FURTHER READING

Pandey, IM. 2009. *Financial Management*. India: Vikas Publishing Pvt Ltd.

Kuchal, SC. 1999. *Financial Management: An Analytical and Conceptual Approach*. India: Chaitanya Publishing house.

Horne Van, C. James. 2001. *Financial Management and Policy*. New Delhi: Prentice Hall.

Endnotes

1. Van Horne, J.C. *Financial Management and Policy*, Prentice-Hall of India, p. 422. Also see Weston, J.F. and Copeland, T.E., *Managerial Finance*, Dryden Press, 1986, pp. 223–26 for an illustrative discussion on cash budgeting.
2. Conference Board, *Cash Management*, New York: The Conference Board Inc., 1973, p. 5.
3. See Van Horne, *op. cit.*, p. 425, and Weston, and Copeland, *op. cit.*, pp. 223–28, for a detailed illustration and discussion on the receipts and disbursements method.
4. Conference Board, *Cash Management*, New York: The Conferenc Board Inc., 1973, p. 13.
5. Ramamoorthy, V.E., *op. cit.*, p. 136.
6. Van Horne, *op. cit.*, p. 423.

NOTES

UNIT 3 SOURCE OF CAPITAL

Structure

- 3.0 Introduction
- 3.1 Unit Objectives
- 3.2 Preferred Stock and Common Stock
 - 3.2.1 Default Risk and Credit Rating
- 3.3 Long-Term Debt and Retained Earnings
- 3.4 Choice of Sources of Funds
 - 3.4.1 Debentures and Bonds
- 3.5 Capital Structure Planning
 - 3.5.1 Capital Structure Practices in India
- 3.6 Summary
- 3.7 Key Terms
- 3.8 Answers to 'Check Your Progress'
- 3.9 Questions and Exercises
- 3.10 Further Reading
 - Endnotes/References

NOTES

3.0 INTRODUCTION

Assets can be real or financial; securities, like shares and bonds are called financial assets, while physical assets like plant and machinery are called real assets. The concepts of return and risk, as the determinants of value, are as fundamental and valid to the valuation of securities as to that of physical assets. It should also be noted that ordinary shares are riskier than bonds (or debentures), and also that some shares are more risky than others. It, therefore, naturally follows that investors would commit funds to shares only when they expect that rates of return are commensurate with risk.

Capital structure is the permanent financing of the company represented primarily by long-term debt and shareholder's funds but excluding all short-term credit. As such, a company's capital structure is only a part of its financial structure.

3.1 UNIT OBJECTIVES

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

- Discuss preferred and common stock
- Understand the concept of long-term debt and retained earnings
- Explain the various sources of funds
- Understand the concept of capital structure planning

3.2 PREFERRED STOCK AND COMMON STOCK

Perpetual bonds, also called consols, have an indefinite life and therefore, have no maturity value. Perpetual bonds or debentures are rarely found in practice. After the Napoleonic War, England issued these types of bonds to pay off many smaller issues

NOTES

that had been floated in prior years to pay for the war.¹ In case of the perpetual bonds, as there is no maturity, or terminal value, the value of the bonds would simply be the discounted value of the infinite stream of interest flows.

Suppose that a 10 per cent, ₹ 1,000 bond will pay ₹ 100 annual interest into perpetuity? What would be its value of the bond if the market yield or interest rate were 15 per cent? The value of the bond is determined as follows:

$$B_0 = \frac{\text{INT}}{k_d} = \frac{100}{0.15} = \text{Rs } 667$$

If the market yield is 10 per cent, the value of the bond will be ₹ 1,000 and if it is 20 per cent the value will be ₹ 500. Thus the value of the bond will decrease as the interest rate increases and vice-versa. Table 3.1 gives the value of a perpetual bond paying annual interest of ₹ 100 at different discount (market interest) rates.

Table 3.1 Value of a Perpetual Bond at Different Bond at Different Discount Rates

Discount Rate (%)	Value of Bond (₹)
5	2,000
10	1,000
15	667
20	500
25	400
30	333

Bond Values and Interest Rates

We notice from calculations in Table 3.1 that the value of the bond declines as the market interest rate (discount rate) increases. Bond values decline with rising interest rates because the bond cash flows (interest and principal repayment) are discounted at higher interest rates. Figure 3.1 shows the value of a 10-year, 12 per cent, ₹ 1,000 bond for the market interest rates ranging from 0 per cent to 30 per cent. You may notice from the figure that there is a negative relationship between bond values and the market interest rates.

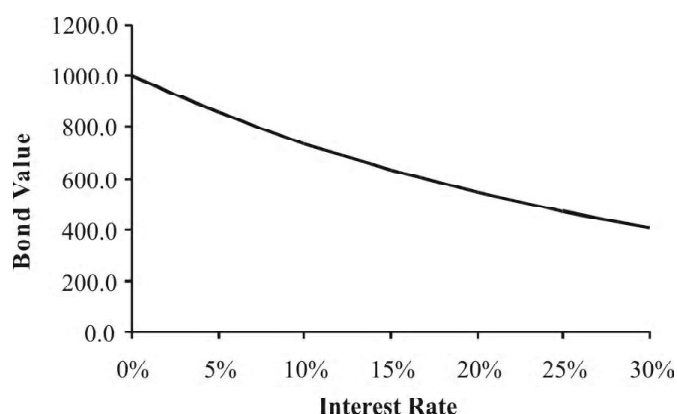


Fig. 3.1 Interest Rate and Bond Value

Bond Maturity and Interest Rate Risk

As explained above, the value of a bond depends upon the market interest rate. As interest rate changes, the value of a bond also varies. There is an inverse relationship between the value of a bond and the interest rate. The bond value would decline when the interest rate rises and *vice versa*. For instance, the value of the perpetual bond in Table 3.1 declines to ₹ 667 from ₹ 1,000 when interest rate rises from 10 per cent to 15 per cent, resulting in a loss of ₹ 333 in value to bondholders. Interest rates have the tendency of rising or falling in practice. Thus, investors of bonds are exposed to the **interest rate risk**; that is, the risk arising from the fluctuating interest rates.

The intensity of interest rate risk would be higher on *bonds with long maturities* than *bonds with short maturities*. This point can be verified by examining Table 3.2 where values of 10 per cent 5-year and 10-year bonds (maturity value of ₹ 1,000) and a perpetual bond are given. These values are also plotted in Figure 3.2. At 10 per cent market interest rate, values of all three bonds are same, *viz.*, ₹ 1,000. When the market interest rate rises to, say, 15 per cent, then the value of 5-year bond falls to ₹ 832, 10-year bond to ₹ 749 and perpetual bond still further to ₹ 667. Similarly, the value of long-term bond will fluctuate (increase) more when rates fall below 10 per cent.

Table 3.2 Bond Value at Different Interest Rates

Dis. rate (%)	Present Value (₹)		
	5-Yr bond	10-Yr bond	Perp. bond
5	1,216	1,386	2,000
10	1,000	1,000	1,000
15	832	749	667
20	701	581	500
25	597	464	400
30	513	382	333

The differential value response to interest rates changes between short and long term bonds will always be true. Thus, two bonds of same quality (in terms of the risk of default) would have different exposure to interest rate risk—the one with longer maturity is exposed to greater degree of risk from the increasing interest rates.²

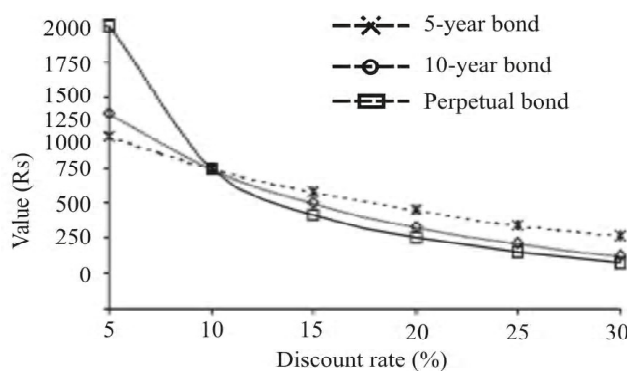


Fig. 3.2 Value of Bonds at Varying Interest Rates

The reason for this differential responsiveness is not difficult to understand. For example, in the case of 10-year bond, one would get just ₹ 100 even if interest rate rises to, say, 15 per cent. In case of 5-year bond, one can, at least, sell the bond after five years, and reinvest money to receive ₹ 150 for the next five years.

NOTES

NOTES

Bond Duration and Interest Rate Sensitivity

We have discussed that bond prices are sensitive to changes in the interest rates, and they are inversely related to the interest rates. The intensity of the price sensitivity depends on a bond's maturity and the coupon rate of interest. The longer the maturity of a bond, the higher will be its sensitivity to the interest rate changes. Similarly, the price of a bond with low coupon rate will be more sensitive to the interest rate changes.

A bond's maturity and coupon rate provide a general idea of its price sensitivity to interest rate changes. However, the bond's price sensitivity can be more accurately estimated by its duration. A bond's duration is measured as the weighted average of times to each cash flow (interest payment or repayment of principal). Duration calculation gives importance to the timing of cash flows; the weight is determined as the present value of cash flow to the bond value. Hence, two bonds with similar maturity but different coupon rates and cash flow patterns will have different durations.

Let us consider two bonds with five-year maturity. The 8.5 per cent rate bond of ₹ 1,000 face value has a current market value of ₹ 954.74 and a YTM of 10 per cent, and the 11.5 per cent rate bond of ₹ 1,000 face value has a current market value of ₹ 1,044.57 and a yield to maturity of 10.6 per cent. Table 3.3 shows the calculation of duration for the two bonds. Each cash flow is discounted at YTM to calculate its present value. Next we find out the proportion of the present value of each flow to the value of the bond. The duration of the bond is calculated as the weighted average of times to the proportion of the present value of cash flows.

We can notice from Table 3.3 that 71.4 per cent of the present value of cash flows of the 8.5 per cent bond and 65.2 per cent of the 11.5 per cent bond occur in the last year. The duration of 8.5 per cent bond (the lower coupon bond) is higher than the duration of 11.5 per cent bond (the higher coupon bond).

The **volatility** or the interest rate sensitivity of a bond is given by its duration and YTM. A bond's volatility, referred to as its **modified duration**, is given as follows:

$$\text{Volatility of bond} = \frac{\text{Duration}}{(1 + \text{YTM})} \quad (1)$$

Table 3.3 Duration of Bonds (8.5 Per cent Bond)

Year	Cash Flow	Present Value at 10%	Proportion of Bond Price	Proportion of Bond Price × Time
1	85	77.27	0.082	0.082
2	85	70.25	0.074	0.149
3	85	63.86	0.068	0.203
4	85	58.06	0.062	0.246
5	1,085	673.70	0.714	3.572
		943.14	1.000	4.252
(11.5 Per cent Bond)				
Year	Cash Flow	Present Value at 10.6 %	Proportion of Bond Price	Proportion of Bond Price × Time
1	115	103.98	0.101	0.101
2	115	94.01	0.091	0.182

3	115	85.00	0.082	0.247
4	115	76.86	0.074	0.297
5	1,115	673.75	0.652	3.259
		1,033.60	1.000	4.086

The volatilities of the 8.5 per cent and 11.5 per cent bonds are as follows:

$$\text{Volatility of 8.5\% bond} = \frac{4.252}{(1.100)} = 3.87$$

$$\text{Volatility of 11.5\% bond} = \frac{4.086}{(1.106)} = 3.69$$

The 8.5 per cent bond has higher volatility. If YTM increases by 1 per cent, this will result in 3.87 per cent decrease in the price of the 8.5 per cent bond and a 3.69 per cent decrease in the price of the 11.5 per cent bond.

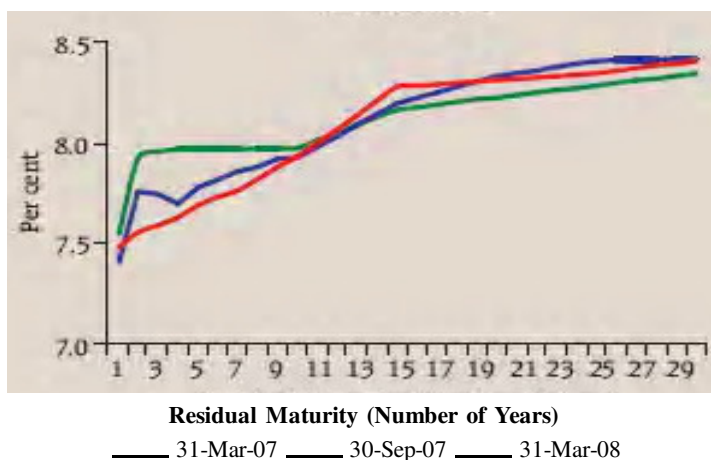


Fig. 3.3 Yield Curve (Government of India Bonds)
Source: Reserve Bank of India

Term Structure of Interest Rates

So far in our discussion, we did not explicitly mention whether there was one single interest rate or several rates. In fact, there are several interest rates in practice. Both companies and the Government of India offer bonds with different maturities and risk features. Debt in a particular risk class will have its own interest rate.

A yield curve for the Government of India bonds of different maturities is shown in Figure. 3.3. **Yield curve** shows the relationship between the yields to maturity of bonds and their maturities. It is also called the **term structure of interest rates**. In Figure 3.3, the yield curve has an upward slope. The upward sloping yield curve implies that the long-term yields are higher than the short-term yields. This is the normal shape of the yield curve, which is generally verified by historical evidence. However, many economies in high-inflation periods have witnessed the short-term yields being higher than the long-term yields. The **inverted yield curves** result when the short-term rates are higher than the long-term rates.

What are the explanations for the shape of the yield curve? There are three theories that explain the yield curve or the term structure of interest rates—(1) expectation theory, (2) liquidity premium theory, and (3) market segmentation theory.

NOTES

NOTES

1. Expectation Theory

The **expectation theory** supports the upward sloping yield curve since investors always expect the short-term rates to increase in the future. This implies that the long-term rates will be higher than the short-term rates. But in the present value terms, the return from investing in a long-term security will equal to the return from investing in a series of a short-term security. Let us consider an example.

Suppose you have an investment horizon of three years. You have two choices: either you invest in a three-year bond, or you invest in one-year bond each year for three years. Assume that YTM on a three-year bond is 5.8 per cent. The current YTM on one-year bond is 5.3 per cent. You expect that the interest rate on one-year bond one year from now will be 5.7 per cent and after two years 6.3 per cent. What should you do? The future values of your investment from the three-year bond and the series of one-year bonds are

$$FV, 3\text{-year bond} = (1.058)^3 = 1.183$$

$$FV, \text{series of one-year bonds} = (1.053)(1.057)(1.063) = 1.183$$

You may notice that there is no advantage in buying a three-year bond at the current yield of 5.8 per cent as compared to buying one-year bond every year and reinvesting the proceeds. Investing in the three-year bond will be beneficial if you expected one-year rates to remain constant at the current level. Since the future values from the alternative investments are the same, you would be indifferent between them. The expectation theory does assume that capital markets are efficient, there are no transaction costs and the investors' sole purpose is to maximize their returns. The long-term rates are geometric average of current and expected short-term rates.

A significant implication of the expectation theory is that given their investment horizon, investors will earn the same average expected returns on all maturity combinations. Hence, a firm will not be able to lower its interest cost in the long run by the maturity structure of its debt.

2. Liquidity Premium Theory

We have seen that the expectation theory postulates an upward-sloping yield curve. This assumes that investors always expect yields to increase in the future. The theory does not explain reason for this behaviour. The liquidity or risk premium theory provides an explanation for the expectation of the investors. We have explained earlier that the prices of the long-term bonds are more sensitive than the prices of the short-term bonds to the changes in the market rates of interest. Hence investors prefer short-term bonds to the long-term bonds. The investors can be compensated for this risk by offering then higher returns on long-term bonds. This extra return, which is called **liquidity premium**, gives the yield curve its upward bias. However, the yield curve could still be inverted if the declining expectations and other factors have more effect than the liquidity premium.

The liquidity premium theory means that rates on long-term bonds will be higher than on the short-term bonds. From a firm's point of view, the liquidity premium theory suggests that as the cost of short-term debt is less, the firm could minimise the cost of its borrowings by continuously refinancing its short-term debt rather taking on long-term debt.

3. Segmented Markets Theory

The **segmented markets** theory assumes that the debt market is divided into several segments based on the maturity of debt. In each segment, the yield of debt depends on the demand and supply. Investors' preferences of each segment arise because they want to match the maturities of assets and liabilities, to reduce the susceptibility to interest rate changes. For example, the liabilities of pension funds are long-term and they would like to ensure that they have sufficient funds to service these liabilities. Therefore, they will invest their funds in long-maturity investments to ensure certainty of returns. On the other hand, the deposits of commercial banks are mostly short-term in nature. Hence, they match their liabilities by lending for short-terms or investing in short-term securities.

The segmented markets theory approach assumes investors do not shift from one maturity to another in their borrowing-lending activities and therefore, the shift in yields are caused by changes in the demand and supply, for bonds of different maturities. Overall, it implies that investors strongly prefer to invest in assets with maturities matching their liabilities, and borrowers prefer to issue liabilities that match the maturity of their assets.

3.2.1 Default Risk and Credit Rating

The Central and State Governments, government bodies, and public sector and private sector companies issue bonds. There is a difference between the government bonds and corporate bonds. Generally, the government is not expected to become insolvent. Investors consider their investment safe when they invest in the government bonds; they do not fear that the government will default on its bonds. On the other hand, companies do get into financial problems and may become bankrupt. Hence there are chances that companies may default on their bonds. Bondholders will never get more than the promised payments from companies, but financially distressed companies may not pay the full promised amount.

Default risk is the risk that a company will default on its promised obligations to bondholders. Bondholders can avoid the default risk by investing their funds in the government bonds instead of the corporate bonds. However, they may invest in corporate bonds if they are compensated for assuming the default risk. Hence companies, in order to induce investors to invest in their bonds, offer a higher return than the return on the government bonds. This difference, called **default premium**, is compensation for the default risk. Thus, the **default premium** is the *spread* between the promised return on a corporate bond and the return on a government bond with same maturity. The default premium will be higher for bonds with higher chances of default.

How do investors assess the default risk of bonds? In most countries there are **credit rating** companies that rate bonds according to their safety. In USA, Moody's and Standard and Poor's and others provide bond ratings. In India, the Credit Rating Information Services Limited (CRISIL), Investment Information and Credit Rating Agency (ICRA), and Credit Analysis and Research Limited (CARE) provide bond and other debt ratings. Table 3.4 provides debenture ratings scheme of CRISIL. Debentures (bonds) with highest safety are rated as AAA (triple A). Debentures rated BBB (triple B) and above are **investment grade debentures**. Debentures rated below BBB are speculative grade, and they are also known as **junk bonds** or high yield bonds.

NOTES

Table 3.4 CRISIL's Debenture Ratings

NOTES

High Investment GradesAAA (Triple A): *Highest Safety*

Debentures rated 'AAA' are judged to offer highest safety of timely payment of interest and principal. Though the circumstances providing this degree of safety are likely to change, such changes as can be envisaged are most unlikely to affect adversely the fundamentally strong position of such issues.

AA (Double A): *High Safety*

Debentures rated 'AA' are judged to offer high safety of timely payment of interest and principal. They differ in safety from 'AAA' issues only marginally.

Investment GradesA: *Adequate Safety*

Debentures rated 'A' are judged to offer adequate safety of timely payment of interest and principal; however, changes in circumstances can adversely affect such issues more than those in the higher rated categories.

BBB (Triple B): *Moderate Safety*

Debentures rated 'BBB' are judged to offer sufficient safety of timely payment of interest and principal for the present; however, changing circumstances are more likely to lead to a weakened capacity to pay interest and repay principal than for debentures in higher rated categories.

Speculative GradesBB (Double B): *Inadequate Safety*

Debentures rated 'BB' are judged to carry inadequate safety of timely payment of interest and principal; while they are less susceptible to default than other speculative grade debentures in the immediate future, the uncertainties that the issuer faces could lead to inadequate capacity to make timely interest and principal payments.

B: *High Risk*

Debentures rated 'B' are judged to have greater susceptibility to default; while currently interest and principal payments are met, adverse business or economic conditions would lead to lack of ability or willingness to pay interest or principal.

C: *Substantial Risk*

Debentures rated 'C' are judged to have factors present that make them vulnerable to default; timely payment of interest and principal is possible only if favourable circumstances continue.

D: *In Default*

Debentures rated 'B' are judged to have greater susceptibility to default; while currently interest and principal payments are met, adverse business or economic conditions would lead to lack of ability or willingness to pay interest or principal.

Notes:

1. CRISIL may apply "+" (plus) or "-" (minus) signs for ratings from AA to D to reflect comparative standing within the category.
2. The contents within parenthesis are a guide to the pronunciation of the rating symbols.
3. Preference share rating symbols are identical to debenture rating symbols except that the letters "pf" are prefixed to the debenture rating symbols, e.g. pfAAA ("pf Triple A").

Source: Credit Rating Information Services of India Limited (CRISIL), www.crisil.com

A company may issue two types of shares—(a) ordinary shares and (b) preference shares. Owners of shares are called shareholders, and capital contributed by them is called share capital.

Preference shares have preference over ordinary shares in terms of payment of dividend and repayment of capital *if* the company is wound up. They may be issued with or without a maturity period. **Redeemable preference shares** are shares with maturity. **Irredeemable preference shares** are shares without any maturity.³ The holders of preference shares get dividends at a fixed rate. With regard to dividends, preference shares may be issued with or without cumulative features. In case of **cumulative preference shares**, unpaid dividends accumulate and are payable in the future. Dividends in arrears do not accumulate in the case of **non-cumulative preference shares**.

Features of Preference and Ordinary Shares

The following are the features of preference and ordinary shares:

- **Claims:** Preference shareholders have a claim on assets and incomes prior to ordinary shareholders. Equity (ordinary) shareholders have a residual claim on a company's incomes and assets. The Equity shareholders are the legal owners of the company.
- **Dividend:** The dividend rate is fixed in the case of preference shares. Preference shares may be issued with cumulative rights, i.e., dividend will accumulate until paid-off. In the case of equity shares neither the dividend rate is known, nor does dividend accumulate. Dividends paid on preference and equity shares are not tax deductible.
- **Redemption:** Both redeemable and irredeemable preference shares can be issued in India. Redeemable preference shares have a maturity date while irredeemable preference shares are perpetual. Equity shares have no maturity date.
- **Conversion:** A company can issue convertible preference shares. That is, after a stated period, such shares can be converted into ordinary shares.

Like bonds, it is relatively easy to estimate cash flows associated with preference shares. The cash flows may include annual preference dividend and redemption value on maturity, in case of redeemable preference shares. The value of the preference share would be the sum of the present values of dividends and the redemption value.

ILLUSTRATION 3.1: Value of a Preference Share

Suppose an investor is considering the purchase of a 12-year, 10 per cent ₹ 100 par value preference share. The redemption value of the preference share on maturity is ₹ 120. The investor's required rate of return is 10.5 per cent. What should she be willing to pay for the share now?

The investor would expect to receive ₹ 10 as preference dividend each year for 12 years and ₹ 110 on maturity (i.e., at the end of 12 years). We can use the present value annuity factor to value the constant stream of preference dividends and the present value factor to value the redemption payment.

$$P_0 = 10 \times \left[\frac{1}{0.105} - \frac{1}{0.105 \times (1.105)^{12}} \right] + \frac{120}{(1.105)^{12}}$$

$$= 10 \times 6.506 + 120 \times 0.302 = 65.06 + 36.24 = \text{Rs } 101.30$$

NOTES

NOTES

Note that the present value of ₹ 101.30 is composite of the present value of dividends, ₹ 65.06 and the present value of the redemption value, ₹ 36.24. The ₹ 100 preference share is worth ₹ 101.3 today at 10.5 per cent required rate of return. The investor would be better off by purchasing the share for ₹ 100 today.

A formula similar to the valuation of bond can be used to value preference shares with a maturity period:

Value of preference share = Present value of dividends + Present value of maturity value

$$P_0 = \left[\frac{\text{PDIV}_1}{(1+k_p)^1} + \frac{\text{PDIV}_2}{(1+k_p)^2} + \dots + \frac{\text{PDIV}_n}{(1+k_p)^n} \right] + \frac{P_n}{(1+k_p)^n}$$

$$P_0 = \sum_{t=1}^n \frac{\text{PDIV}_t}{(1+k_p)^t} + \frac{P_n}{(1+k_p)^n} \quad (2)$$

PDIV_t is the preference dividend per share in period t , k_p the required rate of return of preference share and P_n the value of the preference share on maturity. Since PDIV is an annuity, Equation (2) can also be written as follows:

$$P_0 = \text{PDIV} \times \left[\frac{1}{k_p} - \frac{1}{k_p(1+k_p)^n} \right] + \frac{P_n}{(1+k_p)^n} \quad (3)$$

Note that the term within parentheses on the right-hand side of the equation is the present value factor for an annuity of ₹ 1.

Valuing Irredeemable preference share

How can we value an irredeemable preference share? Consider that a company has issued ₹ 100 irredeemable preference shares on which it pays a dividend of ₹ 9. Assume that this type of preference share is currently yielding a dividend of 11 per cent. What is the value of the preference share? The preference dividend of ₹ 9 is a perpetuity. Therefore, the present value of the preference share is

$$P_0 = \frac{\text{PDIV}}{k_p} = \frac{9}{0.11} = \text{Rs } 81.82$$

Yield on preference share

We can ask a different question. If the price of the preference share is ₹ 81.82, what return do investors require? In that case, we will have to solve the following equation:

$$81.82 = \frac{9}{k_p}; \quad k_p = \frac{9}{81.82} = 0.11 \text{ or } 11 \text{ per cent}$$

The rate k_p , is the preference share's yield-to-maturity. For a preference share with maturity (Equation 3), k_p can be found out by trial and error.

Valuation of Ordinary Shares

The valuation of ordinary or equity shares is relatively more difficult. The difficulty arises because of two factors:⁴ First, the rate of dividend on equity shares is not known; also, the payment of equity dividend is *discretionary* i.e., dependent on the company's discretion. Thus, the estimates of the amount and timing of the cash flows expected by

equity shareholders are more uncertain. In the case of debentures and preference shares, the rate of interest and dividend, respectively, are known with certainty. It is, therefore, easy to make the forecasts of cash flows associated with them. Second, the earnings and dividends on equity shares are generally expected to grow, unlike the interest on bonds and preference dividend. This feature of variable dividend on equity shares makes the calculation of share value difficult.

Dividend Capitalization

The general principle of valuation applies to the share valuation. The value of a share today depends on cash inflows expected by investors and the risks associated with those cash inflows. Cash inflows expected from an equity share consist of dividends that the owner expects to receive while holding the share and the price, which he expects to obtain when the share is sold. The price, which the owner is expected to receive when he sells the share, will include the original investment plus a capital gain (or minus a capital loss).

Normally a shareholder does not hold shares in perpetuity. He holds shares for some time, receives the dividends and finally, sells them to a buyer to obtain capital gains. But when he sells the share, the new buyer is also simply purchasing a stream of future dividends and a liquidating price when he in turn sells the share. The logic can be extended further. The ultimate conclusion is that, for shareholders in general, the expected cash inflows consist only of future dividends and, therefore, the value of an ordinary share is determined by capitalising the future dividend stream at the opportunity cost of capital. The opportunity cost of capital bond is the return that the shareholder could earn from an investment of equivalent risk in the market. The value of a share is the present value of its future stream of dividends. How can a share be valued?

Single Period Valuation

Let us assume that an investor intends to buy a share and will hold it for one year. Suppose he expects the share to pay a dividend of ₹ 2 next year, and would sell the share at an expected price of ₹ 21 at the end of the year. If the investor's opportunity cost of capital or the required rate of return (k_e) is 15 per cent, how much should he pay for the share today?

The present value of the share today, P_0 , will be determined as the present value of the expected dividend per share, at the end of the first year, DIV_1 , plus the present value of the expected price of the share, after a year, P_1 .

$$P_0 = \frac{DIV_1 + P_1}{1 + k_e} \quad (4)$$

$$P_0 = \frac{2 + 21}{1.15} = \text{Rs } 20$$

Equation (4) gives the 'fair' or 'reasonable' price of the share since it reflects the present value of the share. The investor would buy the share if the actual price were less than ₹ 20. In a *well-functioning capital market*, there ought not to be any difference between the present value and market value of the share. Investors would have full information and it would be reflected in the market price of the share, in a well-functioning market. In practice, there could be a difference between the present value and the market value of a share. An **under-valued share** has a market price less than the share's present value. On the other hand, an **over-valued share** has a market price higher than the share's present value.

NOTES

It may be seen in the example that the share value after a year represents an expected growth (g) or capital gain of 5 per cent:

$$g = \frac{P_1 - P_0}{P_0}; \quad g = \frac{21 - 20}{20} = 0.05 \text{ or } 5 \text{ per cent}$$

NOTES

An investor can, thus, represent his expectation with regard to the future share price in terms of expected growth. If the share price is expected to grow at g per cent, then we can write P_1 as follows:

$$P_1 = P_0(1 + g); \quad \text{We can rewrite Equation (4) as}$$

$$P_0 = \frac{\text{DIV}_1 + P_0(1 + g)}{1 + k_e} \quad (5)$$

Simplifying Equation (5), share valuation can be⁵:

$$P_0 = \frac{\text{DIV}_1}{k_e - g} \quad (6)$$

In other words, the present value of a share is determined by its expected dividend, discounted (divided) by the difference of the shareholders capitalization, or required, rate of return (k_e) and growth rate (g). In the example, if the investor would have expected the share price to grow at 5 per cent, the value of the share today using Equation (6) will be

$$P_0 = \frac{2}{0.15 - 0.05} = \frac{2}{0.10} = \text{Rs } 20$$

Multi-period Valuation

In the preceding section, we discussed a single-period share valuation model, where the investor was expected to hold the share for one year and then sell it at the end of the year. The investor will receive dividend for one year, DIV_1 , and the share value, P_1 , when he sells the share at the end of the year. The value of the share today is given by Equation (4).

Why does the new investor purchase the share at the end of one year? Because he also expects a stream of dividends during the period he holds the share plus the liquidating price of the share. What determines the next year's price (P_1) if the share is held for one year? The price next year (P_1) will depend on expected dividend in year 2 and expected price of the share at the end of year 2. For example, if we consider that $\text{DIV}_2 = ₹ 2.10$ and $P_2 = ₹ 22.05$, then P_1 is

$$P_1 = \frac{2.10 + 22.05}{1.15} = \text{Rs } 21$$

Today's price (P_0) can be calculated as the discounted value of dividends in years 1 and 2 and liquidating price at the end of year 2 as follows:

$$P_0 = \frac{2}{1.15} + \frac{2.10 + 22.05}{(1.15)^2} = \text{Rs } 20$$

Thus, if Equation (4) holds, P_1 should be given by the following formula:

$$P_1 = \frac{\text{DIV}_2 + P_2}{1 + k_e} \quad (7)$$

We can express P_0 as follows:

$$P_0 = \frac{1}{1+k_e}(\text{DIV}_1 + P_1)$$

By substituting the value of P_1 from Equation (8), we obtain the share price today as given below:

$$P_0 = \frac{1}{1+k_e} \left[\text{DIV}_1 + \frac{\text{DIV}_2 + P_2}{1+k_e} \right]$$

$$P_0 = \frac{\text{DIV}_1}{1+k_e} + \frac{\text{DIV}_2 + P_2}{(1+k_e)^2} \quad (8)$$

We can further extend the time horizon. We can, for example, determine the price of the share after 2 years (P_2):

$$P_2 = \frac{\text{DIV}_3 + P_3}{1+k_e} \quad (9)$$

and determine today's price, P_0 , in terms of dividends for 3 years and price after 3 years. If the final period is n , we can write the general formula for share value as follows:

$$P_0 = \frac{\text{DIV}_1}{(1+k_e)} + \frac{\text{DIV}_2}{(1+k_e)^2} + \dots + \frac{\text{DIV}_n + P_n}{(1+k_e)^n} \quad (10)$$

$$P_0 = \sum_{t=1}^n \frac{\text{DIV}_t}{(1+k_e)^t} + \frac{P_n}{(1+k_e)^n} \quad (11)$$

How does Equation (11) work? Consider an example, as given in Illustration 3.2.

ILLUSTRATION 3.2: Value of Share Under Constant Growth

Suppose the price of a share today (P_0) is ₹ 20 and it is expected to increase at an annual rate of 5 per cent. Thus, the price after a year will be: ₹ 20 (1.05) = ₹ 21; after two years: ₹ 21 (1.05) = ₹ 22.05 and so on. Further, assume that the expected dividend after a year (DIV_1) is ₹ 2, and it is also expected to grow at a rate of 5 per cent per annum. Thus, the expected dividend after two years will be: ₹ 2 (1.05) = ₹ 2.10; after three years: ₹ 2.10 (1.05) = ₹ 2.21 and so on. Suppose the opportunity cost of capital is 15 per cent, what would be the price of share if it were held for 5 years?

The price would equal the present value of dividends for 5 years plus the present value of the share price at the end of 5 years. That is:

$$P_0 = \left[\frac{2.00}{(1.15)} + \frac{2.10}{(1.15)^2} + \frac{2.21}{(1.15)^3} + \frac{2.32}{(1.15)^4} + \frac{2.43}{(1.15)^5} \right] + \frac{25.53}{(1.15)^5}$$

$$= 7.31 + 12.69 = \text{Rs } 20$$

The present value of the stream of dividends is ₹ 7.31 and of the share price at the end of five years is ₹ 12.69. The total present value of the share is ₹ 20.

We use the values in Illustration 3.2 to show the present values of dividend stream [$SPV(\text{DIV}_t)$] and the future price [$PV(P_n)$] separately in Table 3.5. You can see from Table 3.5 and Figure 3.4 that as the time horizon lengthens, the proportion of present value contributed by the dividends increases. The present value of future (terminal or liquidating) price declines as the time horizon increases; it is almost zero for 50-year or higher time horizon. You may also notice that after about 50 years the present value

NOTES

NOTES

contribution of *additional* dividends is insignificant. The total present value of dividends plus terminal price remains the same, i.e. ₹ 20, irrespective of the time horizon.⁶

In principle, the time horizon n could be very large; in fact, it can be assumed to approach infinity (∞). *If the time horizon, n , approaches to infinity, then the present value of the future price will approach to zero.* Thus the price of a share today is the present value of an infinite stream of dividends.

$$P_0 = \frac{DIV_1}{(1+k_e)} + \frac{DIV_2}{(1+k_e)^2} + \dots + \frac{DIV_{n=\infty}}{(1+k_e)^{n=\infty}} \quad (12)$$

$$P_0 = \sum_{t=1}^{n=\infty} \frac{DIV_t}{(1+k_e)^t} \quad (13)$$

It will be observed that the procedure for calculating the share value is similar to the calculation of an asset's present value; cash flows in terms of dividend stream are discounted by the opportunity cost of capital or the capitalization rate. It must be remembered that the formula for determining the share price, i.e.,

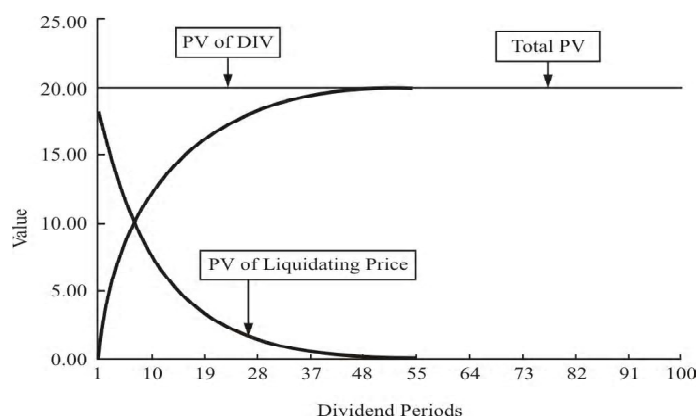


Fig. 3.4 Present value of dividends and future share price

Table 3.5 Present Values of Dividends and Future Price under Various Time Horizons

Year (n)	DIV_t	$SPV(DIV_t)$	P_t	$PV(P_t)$	Total PV
1	2.00	1.74	21.00	18.26	20.00
2	2.10	3.33	22.05	16.67	20.00
3	2.21	4.78	23.15	15.22	20.00
4	2.32	6.10	24.31	13.90	20.00
5	2.43	7.31	25.53	12.69	20.00
10	3.10	11.95	32.58	8.05	20.00
20	5.05	16.76	53.07	3.24	20.00
25	6.45	17.94	67.73	2.06	20.00
50	21.84	19.79	229.35	0.21	20.00
75	73.97	19.98	776.65	0.02	20.00
100	250.48	20.00	2,630.03	0.00	20.00

Equations (12) and (13) does not ignore terminal value of the share and capital gains. The basis of formula was the assumption that value is determined by expected dividends and the terminal price, P_n .⁷ The term representing the terminal price has disappeared from the formula because, as we have shown in Table 3.5 and Figure 3.4,

Check Your Progress

1. What is interest risk rate?
2. What is a yield curve?
3. Define default risk.
4. What is meant by default premium?
5. Define share capital.

as the holding period approaches infinity, the present value of the terminal price approaches zero.

Dividends, DIV_t , in Equation (11 or 13) represent stream of *expected dividends*. In practice, DIV_t could rise, fall, remain constant, or fluctuate randomly. In the following sections we discuss the cases of rising, falling and constant dividends.

NOTES

3.3 LONG-TERM DEBT AND RETAINED EARNINGS

Long-term debt appears on the balance sheet of a company. It refers to the money a company owes which it doesn't expect to pay off in the next year. Long term debt includes mortgages on corporate buildings and / or land, bank loans, bonds issued to fixed income investors from whom the corporation raises money in exchange for the promise to return those funds in the future, while paying interest at the same time. Financing agreements would be considered long-term debt. Other securities such as commercial papers and repos are not considered to be long-term debt because their maturities are shorter than one year. A firm must disclose its long term debt along with its interest rate and date of maturity in its balance sheet.

Retained Earnings

Retained earnings are the profits that have been generated by a company. They are not paid as dividends to shareholders (stockholders), but are either reinvested in the business or to pay off a debt. The reinvestment may be used to purchase new capital assets, for funding new projects, developing new products.

The retained earnings provide funds to finance the firm's long-term growth. It is the most significant source of financing a firm's investments in practice. Retained earnings are preferred because, unlike external equity, they do not involve any flotation costs. Generally, retained earnings should be used as a source of internal financing only when a company has profitable investment opportunities. Retained earnings are also source of equity capital. Most firms distribute only a part of the profit and retain the rest. This is internal financing of capital. Retained earnings are a part of equity capital, because it belongs to the shareholders.

Retained earnings is obtained by adding net income to (or subtracting any net losses from) beginning retained earnings and subtracting any dividends paid to shareholders. The formula is:

$$\text{Retained Earnings (RE)} = \text{Beginning RE} + \text{Net Income} - \text{Dividends}$$

3.4 CHOICE OF SOURCES OF FUNDS

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

One can include subsidy and tax incentives as the sources of funds. These sources are available in a limited way, subject to qualification of projects and businesses. Usually, small entrepreneurs and export-oriented units qualify for subsidy on their qualified investments. Tax incentives are also available to desired investments made by any firm.

Check Your Progress

6. What is meant by long-term debt?
7. Define retained earnings.

NOTES**Types of Ownership Securities**

For non-corporate (sole-proprietorship and partnership) businesses, there is a single type of ownership security available and that is the owners' capital. Owners (sole-proprietor or partners) bring capital and enjoy the rights to participate in managing business (depending upon agreement) and the right to share profit or loss (usually in the proportion of every partner's share in capital). Therefore, the material given in this chapter on the types of ownership security is more appropriate for corporate form of business.

Common or Equity Shares

In case of a company, total ownership fund is called a 'stock' and it is divided into smaller units called 'shares' or 'common shares'.⁸ This allows a company to obtain funds from several owners, who are called 'shareholders' or 'members'. However, a private company can issue shares only privately through friends and relatives but a public⁹ company can issue shares to the public. The salient rights and obligations of equity shareholders are listed below:

- Shareholders have dividend rights, but getting it is uncertain depending upon the profits of the company and decision of the company to distribute profits as dividends.
- Shareholders enjoy the right to vote on matters defined by the Companies Act 1956, which includes right to elect their representatives on the Board of Directors. Right to vote can be exercised in person or via proxy.
- Shareholders have pre-emptive right which means a right to get allotment from the issue of new shares.
- Shareholders have residual rights on surplus funds in the event of liquidation of the company.
- Shareholders have the right to transfer shares, albeit with restrictions if the shares are in a private company.
- Shareholders' liability for the debt of the company is limited to the par value of shares held by them.

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

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

Types of common shares

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

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

The suppliers of common share capital are promoters, friends and relatives (sometimes called ‘love money’), general public, venture capitalists, angel capitalists and charitable venture capitalists. Some of these are described below.

Venture capitalists

Usually, start-up businesses with new ideas (like information technology businesses, biotechnology businesses are the current examples) are risky and therefore, it is unlikely that regular suppliers of funds will fund such projects. Such ventures may be potentially quite profitable but very risky. Some investors (usually wealthy individuals, investment banks and other financial institutions) see an opportunity here. They pool their own funds to form a *venture capital fund* with the purpose of finding and providing equity capital to such high potential growth firms. Venture capitalists also provide technical and managerial expertise and keep a say in the firm’s decisions. In the initial agreement, venture capitalist inserts an exit clause, which is via taking the firm public or sale of business. As per this clause, after a pre-determined number of years, the new venture will ‘go public’ (means will become a company and will make initial public offering of shares), or sell the firm and the venture capitalist walks out with his share from the proceeds.

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

Angel capitalists

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

Charitable venture capitalists

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

Charitable venture capitalists operate exactly like venture capitalists but have a broader list of businesses that they support (usually ones that are likely to result into a positive regional growth in terms of employment and tax revenue). Charitable venture capitalists do make profit but reinvest the same for further investment purposes. Those who are interested to learn about such funding organizations may have a look at an example¹⁰ from the US. There is a scope for such organizations in different regions of India also.

NOTES

NOTES**Preference Shares**

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

Deferred Shares

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

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

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

Subsidy and Tax Incentives

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

For example, the central government developed a scheme¹¹ for capital investment subsidy in 1997 for units in 'growth centres' for the north eastern region and other areas. The central government announces subsidy plans for different regions from time to time. One needs to read the current industrial policy of the Government of India, with special attention to the applicable subsidy based on the classification of the zone in which the business is set up.

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

Subsidy is shown as capital and is tax-free.

Types of Debt Securities

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

Interest paid on term loan and bonds is tax deductible as legitimate business expense for the firm and the supplier of the loan pays income tax on interest receipt. In case of lease, if it is an operating lease the entire lease rental is tax deductible for the lessee (borrower). But, if it is a finance lease (also called as capital lease), then the entire lease rent may not be deductible for tax purpose and only the interest portion in the rent may be allowed as deduction.

Loan or debt can be designed with several features (Box 3.1).

Box 3.1 *Features of Debt Securities*

- Par Value
- Maturity Period
 - o Call and put provisions
 - o Deferred callable bonds
- Maturity Value (at par, at premium or at discount)
- Interest
 - o Rate of Interest
 - Fixed rate
 - Floating (variable) rate
 - Reverse floaters
 - Asset backed
 - Catastrophe bonds
 - o Timing of Payment of Interest
 - At regular interval of time
 - Ballooning
 - On maturity
 - o Method Payment
- Other Provisions
 - o Security
 - o Dividend restrictions
 - o Subordination of future debt
 - o Conversion

Term Loan

Term loan is usually supplied by commercial banks and financial institutions. Term loan is for a specific term (period) at a fixed or variable interest rate, with interest payable periodically, issued against some security and usually with several negative covenants attached. Negative covenants include, periodic reporting of accounting and other

NOTES

NOTES

information, prior approval of the lender before some activities or changes are undertaken, appointment of members of Board of Directors and so on.

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

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

Lease

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

A firm can acquire assets on lease instead of borrowing funds and then buying assets. In some situations lease arrangement is very helpful. A lessee (borrower) may get hundred per cent finance (except down payment) for the assets and it may turn out to be more convenient and at times cheaper too. Lease payment is negotiable and therefore, one can create a better match of lease payment with project cash flow. Lease arrangement may be found cheaper in three ways if the lessor (lender) has access to cheaper funds or the lessor specializes in the assets that the lessee wants or the lessor is in higher tax bracket than the lessee. Otherwise, leasing is usually expensive.

3.4.1 Debentures and Bonds

Companies can divide their loan requirements in units of small denominations and issue them to several parties. These units are called 'debentures' or 'bonds'. If these units are backed by collateral, then they are called 'bonds'; otherwise they are called 'debentures'. Publicly issued debentures and bonds are listed in the bonds market to facilitate trading and enhance liquidity. In the following discussion, the term 'bond' will be used to denote bonds as well as debentures.

Main Features of Bonds

Issue price: Bonds are issued at par or at premium or at discount, depending upon the coupon rate versus current market expectations. The market expects a rate on a bond of a firm depending upon the risk-free rate and default possibility of the firm. If the market expected rate is higher than the coupon rate offered, bonds will be issued at a discount and vice-a-versa. If the two rates are equal, then the bonds can be issued at par.

Maturity period: The firm has to determine the maturity period of bonds. Several factors are considered in determining the maturity period, like the firm's needs, market

NOTES

situation, cost of funds and so on. A firm may include a call provision, which allows the firm to issue bonds for a specific maturity period with an option to call back the bonds on and after a specified time. Usually, call-premium is embedded with call-option, which means the firm will pay a premium over the par value if bonds are called earlier than the maturity date. It is also possible to offer a right to bondholders to put the bonds back with the firm. This right is called a 'put option'. Usually, a bondholder can exercise a put option after a certain date and accept repayment at discount over the par value. Call and put provisions are helpful in reducing maturity risk premium.

Maturity value: The terms of issue will specify the maturity amount payable on the maturity date. Bonds may be repaid either at par or at premium or at discount.

Interest: Bonds may carry a fixed coupon rate, usually payable semi-annually or quarterly. Variable rate bonds are gradually becoming popular. The different types of bonds/debentures would be briefly touched upon in the next section, to bring out different interest rates and interest payment terms.

Interest is usually paid through cheques issued by the firm upon due date. However, firms may attach post-dated interest coupons with the bonds certificate. These post-dated interest coupons are detachable and can be sold in the market separately from the bond itself.

Supervision: Since bonds are held by public, by law, a firm has to appoint 'bond trustees' to oversee the firm's compliance with terms and conditions of issue of bonds and other laws applicable to the bondholders' rights.

Other provisions: Several other provisions can be included in the bond contract (known as bond indenture). Dividend restrictions can be imposed to conserve cash flow needed for reducing the chance of default; rights of the current bondholders over future bondholders, if any, especially if the same assets are used as collateral for future bonds; conversion option, if any; call or put provision with call or put -date and call-premium or put-discount, if any.

Carefully designed (mix and match of various terms including the maturity period, interest payment terms, call and put features and others) bonds can cost less and help matching debt servicing cash flow with project cash flow.

Types of bonds

A mix and match of features can create a new type of bonds. Some important types of bonds are:

Zero-coupon bonds: Zero-coupon bonds, also known as deep-discount bonds or strip-bonds, are issued at discount, pay no interest during the life of bonds and repay the par value at the time of maturity. Usually, zero-coupon bonds are auctioned in which investors make offer price (which is at the present value of future maturity price). Financing a long gestation period project with zero-coupon bonds is at times desirable for conserving the much-needed cash flow and for reducing cost of debt.

Floating rate bonds: These are also known as variable rate bonds on which interest rate is usually linked with treasury bill rate or inflation index or LIBOR (London Inter-Bank Offer Rate) or any other factor as per the terms in the issue of bonds. One can build caps and floors of interest rate. In case of a cap variable, the rate cannot go above the cap rate and in case of a floor variable, the rate cannot go below the floor rate. Floating rate bonds remove maturity risk premium from the cost of bonds to the extent of cap and floor, if any.

NOTES

Reverse floaters: Reverse floaters are variable rate bonds but the interest rate on them moves inverse to the change in price index or treasury bill returns. The rate on reverse floaters declines when index or treasury bill rates increase and vice-versa.

Asset-backed bonds: These are also variable rate bonds but the interests rate on these bonds are tied with the income on some specified assets.

Catastrophe bonds: These bonds offer no or very low interest rate in a normal situation but extremely high rate in the event of a pre-defined catastrophe (like, hurricane, tsunami, or earthquake).

Here, only those types of bonds that have bearing on interest payment schemes are listed, while other types are excluded.

Public Deposits

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

3.5 CAPITAL STRUCTURE PLANNING

According to Gerstenberg, capital structure refers to 'the make up of a firm's capitalisation'. In other words, it represents the mix of different sources of long-term funds (such as equity shares, preference shares, long-term loans, retained earnings) in the total capitalisation of the company. For example, a company has equity shares of ₹ 1,00,000, debentures ₹ 1,00,000, preference shares of ₹ 100,000 and retained earnings of ₹ 50,000. The term capitalisation is used for total long-term funds. In this case it is off ₹ 3,50,000. The term 'capital structure' is used, for the mix of capitalisation. In this case it will be said that the capital structure of the company consists of ₹ 1,00,000 in equity shares, ₹ 1,00,000 in preference shares, ₹ 1,00,000 in debentures and ₹ 50,000 in retained earnings.

The capital structure of a company is to be determined initially at the time the company is floated. Great caution is required at this stage, since the initial capital structure will have long-term implications. Of course, it is not possible to have an ideal capital structure but the management should set a target capital structure and the initial capital structure should be framed and subsequent changes in the capital structure should be done keeping in view the target capital structure. Thus, the capital structure decision is a continuous one and has to be taken whenever a firm needs additional finances.

Following are the factors which should be kept in view while determining the capital structure of a company:

(1) Trading on Equity

A company may raise funds either by issue of shares or by debentures. Debentures carry a fixed rate of interest and this interest has to be paid irrespective of profits. Of course, preference shares are also entitled to a fixed rate of dividend but payment of dividend depends upon the profitability of the company. In case the rate of return (*ROD*) on the total capital employed (shareholders' funds plus long-term borrowed funds) is

Check Your Progress

8. Classify sources of funds into two main types.
9. What are deferred shares?
10. What are the two types of lease?
11. Define floating rate bonds.

more than the rate of interest on debentures or rate of dividend on preference shares, it is said that the company is trading on equity. For example, the total capital employed in a company is a sum of ₹ 2 lakhs. The capital employed consists of equity shares of ₹ 10 each. The company makes a profit of ₹ 30,000 every year. In such a case the company cannot pay a dividend of more than 15 per cent on the equity share capital. However, if the funds are raised in the following manner, and other things remain the same, the company may be in a position to pay a higher rate of return on equity shareholders' funds:

- (a) ₹ 1 lakh is raised by issue of debentures, carrying interest at 10 per cent p.a.
- (b) ₹ 50,000 is raised by issue of preference shares, carrying dividend at 12 per cent
- (c) ₹ 50,000 is raised by issue of equity shares

In the above case out of the total profit of ₹ 30,000, ₹ 10,000 will be used for paying interest while ₹ 6,000 will be used for paying preference dividends. A sum of ₹ 14,000 will be left for paying dividends to the equity shareholders. Since the amount of equity capital is ₹ 50,000, the company can give a dividend of 28 per cent. Thus, the company can pay a higher rate of dividend than the general rate of earning on the total capital employed.¹² This is the benefit of trading on equity.

Limitations

The trading on equity is subject to the following limitations:

- A company can have trading on equity only when the rate of return on total capital employed is more than the rate of interest/dividend on debentures/preference shares.
- Trading on equity is beneficial only for companies which have stability in their earnings. This is because both interest and preference dividend impose a recurring burden on the company. In the absence of stability in profits the company will run into serious financial difficulties in periods of trade depression.
- Every rupee of extra borrowings increases the risk and hence the rate of interest expected by the subsequent lenders goes on increasing. Thus, borrowings become costlier which ultimately result in reducing the amount of profits available for equity shareholders.

(2) Retaining Control

The capital structure of a company is also affected by the extent to which the promoter/existing management of the company desire to maintain control over the affairs of the company. The preference shareholders and debentureholders have not much say in the management of the company. It is the equity shareholders who select the team of managerial personnel. It is necessary, therefore, for the promoters to own majority of the equity share capital in order to exercise effective control over the affairs of the company. The promoters or the existing management are not interested in losing their grip over the affairs of the company and at the same time, they need extra funds. They will, therefore, prefer preference shares or debentures over equity shares so long they help them in retaining control over the company.

(3) Nature of Enterprise

The nature of enterprise also to a great extent affects the capital structure of the company. Business enterprises which have stability in their earnings or which enjoy monopoly

NOTES

NOTES

regarding their products may go for debentures or preference shares since they will have adequate profits to meet the recurring cost of interest/fixed dividend. This is true in case of public utility concerns. On the other hand, companies which do not have this advantage should rely on equity share capital to a greater extent for raising their funds. This is, particularly, true in case of manufacturing enterprises.

(4) Legal Requirements

The promoters of the company have also to keep in view the legal requirements while deciding about the capital structure of the company. This is particularly true in case of banking companies which are not allowed to issue any other type of security for raising funds except equity share capital on account of the Banking Regulation Act.

(5) Purpose of Financing

The purpose of financing also to some extent affects the capital structure of the company. In case funds are required for some directly productive purposes, for example, purchase of new machinery, the company can afford to raise the funds by issue of debentures. This is because the company will have the capacity to pay interest on debentures out of the profits so earned. On the other hand, if the funds are required for non-productive purposes, providing more welfare facilities to the employees such as construction of school or hospital building for company's employees, the company should raise the funds by issue of equity shares.

(6) Period of Finance

The period for which finance is required also affects the determination of capital structure of companies. In case, funds are required, say for 3 to 10 years, it will be appropriate to raise them by issue of debentures rather than by issue of shares. This is because in case the funds are raised by issue of shares, their repayment after 8 to 10 years (when they are not required) will be subject to legal complications. Even if such funds are raised by issue of redeemable preference shares, their redemption is also subject to certain legal restrictions. However, if the funds are required more or less permanently, it will be appropriate to raise them by issue of equity shares.

(7) Market Sentiments

The market sentiments also decide the capital structure of the company. There are periods when people want to have absolute safety. In such cases, it will be appropriate to raise funds by issue of debentures. At other periods, people may be interested in earning high speculative incomes; at such times, it will be appropriate to raise funds, by issue of equity shares. Thus, if a company wants to raise sufficient funds, it must take into account market sentiments, otherwise its issue may not be successful.

(8) Requirement of Investors

Different types of securities are to be issued for different classes of investors. Equity shares are best suited for bold or venturesome investors. Debentures are suited for investors who are very cautious while preference shares are suitable for investors who are not very cautious. In order to collect funds from different categories of investors, it will be appropriate for the companies to issue different categories of securities. This is particularly true when a company needs heavy funds.

(9) Size of the Company

Companies which are of small size have to rely considerably upon the owners funds for financing. Such companies find it difficult to obtain long-term debt. Large companies are generally considered to be less risky by the investors and, therefore, they can issue different types of securities and collect their funds from different sources. They are in a better bargaining position and can get funds from the sources of their choice.

(10) Government Policy

Government policy is also an important factor in planning the company's capital structure. For example, a change in the lending policy of financial institutions may mean a complete change in the financial pattern. Similarly, by virtue of the Securities & Exchange Board of India Act, 1992 and the Rules made thereunder, the Securities & Exchange Board of India can also considerably affect the capital issue policies of various companies. Besides this, the monetary and fiscal policies of the Government also affect the capital structure decision.

(11) Provision for the Future

While planning capital structure the provision for future should also be kept in view, It will always be safe to keep the best security to be issued in the last instead of issuing all types of securities in one instalment. In the words of Gerestenberg, 'Manager of corporate financing operations must always think of rainy days or the emergencies. The general rule is to keep your best security or some of your best securities till the last.'¹³

Thus, there are many factors which are to be considered while designing an appropriate capital structure of a company. As a matter of fact, some of them are conflicting in nature. The relative weightage assigned to each of these factors will vary widely from company to company depending upon the characteristics of the company, the general economic conditions and the circumstances under which the company is operating. Companies issue debentures and preference shares to enlarge the earnings on equity shares, while equity shares are issued to serve as a cushion to absorb the shocks of business cycles and to afford flexibility. Of course, greater the operating risk, the less debt the firm can use, hence in spite of the fact that the debt is cheaper the company should use it with caution. Moreover, it should be remembered that 'Financial theory has not developed to the point where data related to these considerations are fed at one end of a computer and an ideal financial structure pops out of the other. Consequently, human judgment must be used to resolve the many conflicting forces in laying plans for the types of funds to be sought.'¹⁴

3.5.1 Capital Structure Practices in India

A number of research studies have been conducted regarding the choice of capital structure, *i.e.*, debt and equity mix in the total capitalisation of a firm. These studies have revealed the following:

1. **Capital structure and cost of capital:** Traditional view, that the cost of capital is affected by the debt and equity mix still holds good. The study conducted by Sarma and Rao (1968)¹⁵ and Pandey (1981)¹⁶ confirmed this viewpoint. Chakraborty's (1977)¹⁷ study on debt-equity also revealed this fact. According to his study, the average cost of capital for all the consumer goods industry was the highest while it was the lowest for the intermediate goods firms. This was primarily

NOTES

NOTES

because of low debt content in the total, capital structure in case of former category of industry as compared to the latter.

2. **Choice, between debt and equity:** The earlier studies conducted by Bhatt (1990)¹⁸ and Pandey (1984)¹⁹ revealed that corporate managers generally prefer borrowings to owned funds because of the advantage of the lower cost and no dilution of existing management control over the company. However, in a recent study conducted by Babu and Jain (1998)²⁰ it has been found that the corporate firms in India are now showing almost an equal preference for debt and equity in designing their capital structure. Freedom in paying dividend and easy to raise money are the reasons cited for equity preference. Moreover, due to increasing competition, returns have become uncertain. Hence, companies will not prefer debt over equity though debt is a cheaper source of finance because of tax advantage.
3. **Share Valuation:** According to the study conducted by Prasanna Chandra (1975), a significant relationship existed between share price and variables like return, risk, growth size, leverage. Thus, the leverage or the debt-equity mix in the capital structure is also one of the factors affecting the value of a share of a firm.²¹

3.6 SUMMARY

- Perpetual bonds, also called consols, have an indefinite life and therefore, have no maturity value. Perpetual bonds or debentures are rarely found in practice.
- Interest rate risk is the risk arising from the fluctuating interest rates.
- The intensity of interest rate risk would be higher on bonds with long maturities than bonds with short maturities.
- A bond's maturity and coupon rate provide a general idea of its price sensitivity to interest rate changes.
- A bond's duration is measured as the weighted average of times to each cash flow (interest payment or repayment of principal).
- Yield curve shows the relationship between the yields to maturity of bonds and their maturities. It is also called the term structure of interest rates.
- There are three theories that explain the yield curve or the term structure of interest rates— (1) the expectation theory, (2) the liquidity premium theory, and (3) the market segmentation theory.
- Default risk is the risk that a company will default on its promised obligations to bondholders.
- The default premium is the spread between the promised return on a corporate bond and the return on a government bond with same maturity.
- A company may issue two types of shares: (a) ordinary shares and (b) preference shares.
- Owners of shares are called shareholders, and capital contributed by them is called share capital.
- Redeemable preference shares are shares with maturity. Irredeemable preference shares are shares without any maturity.

Check Your Progress

12. Define capital structure.
13. Why great caution is to be exercised at the initial stage of floating a company?

- In the case of cumulative preference shares unpaid dividends accumulate and are payable in the future. Dividends in arrears do not accumulate in the case of non-cumulative preference shares.
- Long-term debt refers to the money a company owes which it doesn't expect to pay off in the next year.
- Retained earnings are the profits that have been generated by a company. They are not paid as dividends to shareholders (stockholders), but are either reinvested in the business or to pay off a debt.
- The sources of funds are classified into two main types—ownership funds and debt funds.
- In case of a company, total ownership fund is called a 'stock' and it is divided into smaller units called 'shares' or 'common shares'.
- Deferred shares are the type of ownership security that offers a more proportionate right of voting.
- Sources of long-term debt, used for financing projects, can be mainly divided in three categories—term loan, lease and debentures or bonds.
- Term loan is usually supplied by commercial banks and financial institutions. Term loan is for a specific term (period) at a fixed or variable interest rate, with interest payable periodically, issued against some security and usually with several negative covenants attached.
- Companies can divide their loan requirements in units of small denominations and issue them to several parties. These units are called 'debentures' or 'bonds'.
- According to Gerstenberg, capital structure refers to 'the make-up of a firm's capitalisation'. In other words, it represents the mix of different sources of long-term funds (such as equity shares, preference shares, long-term loans, retained earnings etc.) in the total capitalisation of the company.
- The capital structure of a company is to be determined initially at the time the company is floated. Great caution is required at this stage, since the initial capital structure will have long-term implications.

NOTES

3.7 KEY TERMS

- **Interest risk:** Interest rate risk is the risk arising from the fluctuating interest rates.
- **Default risk:** Default risk is the risk that a company will default on its promised obligations to bondholders.
- **Default premium:** Default premium is the spread between the promised return on a corporate bond and the return on a government bond with same maturity.
- **Retained earnings:** Retained earnings are the profits that have been generated by a company. They are not paid as dividends to shareholders (stockholders), but are either reinvested in the business or to pay off a debt.
- **Deferred shares:** Deferred shares are the type of ownership security that offers a more proportionate right of voting.

NOTES

3.8 ANSWERS TO ‘CHECK YOUR PROGRESS’

1. Interest rate risk is the risk arising from the fluctuating interest rates.
2. Yield curve shows the relationship between the yields to maturity of bonds and their maturities.
3. Default risk is the risk that a company will default on its promised obligations to bondholders.
4. Default premium is the spread between the promised return on a corporate bond and the return on a government bond with same maturity.
5. Capital contributed by shareholders is called share capital.
6. Long-term debt refers to the money a company owes which it doesn't expect to pay off in the next year.
7. Retained earnings are the profits that have been generated by a company. They are not paid as dividends to shareholders (stockholders), but are either reinvested in the business or to pay off a debt.
8. The sources of funds are classified into two main types—ownership funds and debt funds.
9. Deferred shares are the type of ownership security that offers a more proportionate right of voting.
10. Lease is of two types— operating and finance (or capital) lease.
11. Floating rate bonds are also known as variable rate bonds on which interest rate is usually linked with treasury bill rate or inflation index or LIBOR (London Inter-Bank Offer Rate) or any other factor as per the terms in the issue of bonds.
12. According to Gerstenberg, capital structure refers to ‘the make up of a firm's capitalisation’. In other words, it represents the mix of different sources of long-term funds (such as equity shares, preference shares, long-term loans, retained earnings etc.) in the total capitalisation of the company.
13. The capital structure of a company is to be determined initially at the time the company is floated. Great caution is required at this stage, since the initial capital structure will have long-term implications.

3.9 QUESTIONS AND EXERCISES

Short-Answer Questions

1. Distinguish between redeemable preference shares and irredeemable preference shares.
2. What are the factors which makes the valuation of ordinary or equity shares difficult?
3. Distinguish between an under-valued and an over-valued share.
4. Distinguish between operating and finance lease.
5. Write a short note on public deposits.
6. What are the limitations of trading on equity?

1. Discuss the theories that explain the yield curve or the term structure of interest rates.
2. Why do preference shares have preference over ordinary shares? Discuss the features of preference and ordinary shares.
3. Discuss the main features of bonds. Explain the important types of bonds.
4. What are the factors which are to be kept in mind while determining the capital structure of a company?

NOTES

3.10 FURTHER READING

Pandey, IM. 2009. *Financial Management*. India: Vikas Publishing Pvt Ltd.

Kuchal, SC. 1999. *Financial Management: An Analytical and Conceptual Approach*. India: Chaitanya Publishing house.

Horne Van, C. James. 2001. *Financial Management and Policy*. New Delhi: Prentice Hall.

Endnotes

1. Weston, J.F. and E.F. Brigham, *Managerial Finance*, Dryden, 1975, p. 538.
2. Weston and Brigham, *op. cit.*, 1975, p. 545. Also, see Nelson, C.R., *The Term Structure of Interest Rates*, in J.L. Bicksler, Ed., *Handbook of Financial Economics*, North-Holland Publishing Co., 1980, for a review of the interest rate structure theory.
3. In some countries like in India, companies are not allowed to issue irredeemable preference shares.
4. Weston and Brigham, *op. cit.*, 1975.
5.
$$P_0 = \frac{DIV_1 + P_0(1+g)}{1+k_e} \quad P_0 + P_0 k_e = DIV_1 + P_0 + P_0 g$$
$$P_0 + P_0 k_e - P_0 - P_0 g = DIV_1 \quad P_0(k_e - g) = DIV_1$$
$$P_0 = \frac{DIV_1}{k_e - g}$$
6. The logic of share valuation is given in the original work of Williams, *op. cit.*, 1938, and in the work of Gordon, Myron, *The Investment, Financing and Valuation of the Corporation*, Richard D. Irwin, 1962. Also, see Brealey, R. and S. Myers, *Principles of Corporate Finance*, McGraw Hill, 1991, pp. 49–52.
7. Brealey and Myers, *op. cit.*, 1991, p. 51.
8. In Western countries, the term ‘common stock’ is used for ‘share’ or ‘common share’ and the same is now being accepted here in India.
9. Not to confuse with public sector companies. A public sector company is owned by government, whereas a public company is defined by the Companies Act, 1956, and is owned by shareholders.
10. For example <http://www.jumpstartinc.org/> located in Cleveland, Ohio, USA.
11. See document on website <http://unpan1.un.org/intradoc/groups/public/documents/APCITY/UNPAN011381.pdf>
12. Tax factor has been ignored.
13. *Financial Organisation and Management of Business*, p. 201.

NOTES

14. Johnson R. W., *Financial Management* (1977), p. 234
15. Sarma L. and K. Rao, "Leverage and Value of Firms", *Journal of Finance*, September, (1.969).
16. Pandey, I.M., "*Capital Structure and Cost of Capital*", (1981), Vikas, New Delhi.
17. Chakraborty, S.K., "Corporate and Cost of Capital", Calcutta, ICWA, 1977.
18. Bhat, Ramesh, "Determinants of Financial Leverage: Some Further Evidence", *The Chartered Accountant* (December, 1980), pp. 451-456.
19. Pandey, I.M., "Financing Decision : A Survey of Management Understanding", *Economic and Political Weekly*, February, 1984.
20. Babu Suresh and Jain R.K. "The Debt of Equity Route." *The Chartered Accountant*, September, 1998.
21. Chandra P. "Valuation of Equity Shares in India (1975)". Sultan Chand & Sons. Delhi.

UNIT 4 COST OF CAPITAL

Structure

- 4.0 Introduction
- 4.1 Unit Objectives
- 4.2 Significance of the Cost of Capital
- 4.3 The Concept of the Opportunity Cost of Capital
- 4.4 Cost of Debt
- 4.5 Cost of Preference Capital
- 4.6 Cost of Equity Capital
- 4.7 Cost of Equity and the Capital Asset Pricing Model (CAPM)
- 4.8 Cost of Equity: CAPM vs Dividend-Growth Model
- 4.9 The Weighted Average Cost of Capital
- 4.10 Flotation Costs, Cost of Capital and Investment Analysis
- 4.11 Calculation of the Cost of Capital in Practice: Case of Larsen and Toubro Limited
- 4.12 Divisional and Project Cost of Capital
- 4.13 Summary
- 4.14 Key Terms
- 4.15 Answers to 'Check Your Progress'
- 4.16 Questions and Exercises
- 4.17 Further Reading
- Endnotes/References

NOTES

4.0 INTRODUCTION

The opportunity cost of capital (or simply, the cost of capital) for a project is the discount rate for discounting its cash flows. The project's cost of capital is the minimum required rate of return on funds committed to the project, which depends on the riskiness of its cash flows. Since the investment projects undertaken by a firm may differ in risk, each one of them will have its own unique cost of capital. It should be clear at the outset that the cost of capital for a project is defined by its risk, rather than the characteristics of the firm undertaking the project.

The firm represents the aggregate of investment projects undertaken by it. Therefore, the firm's cost of capital will be the overall, or average, required rate of return on the aggregate of investment projects. Thus the firm's cost of capital is not the same thing as the project's cost of capital. Can we use the firm's cost of capital for discounting the cash flows of an investment project? The firm's cost of capital can be used for discounting the cash flows of those investment projects, which have risk equivalent to the average risk of the firm. As a first step, however, the firm's cost of capital can be used as a standard for establishing the required rates of return of the individual investment projects. In the absence of a reliable formal procedure of calculating the cost of capital for projects, the firm's cost of capital can be adjusted upward or downward to account for risk differentials of investment projects. That is, an investment project's required rate of return may be equal to the firm's cost of capital plus or minus a risk adjustment factor, depending on whether the project's risk is higher or lower than the firm's risk. There does exist a methodology to calculate the cost of capital for projects. The objective method of calculating the risk-adjusted cost of capital for projects is to use the capital asset pricing model (CAPM), as we show later in this unit.

NOTES

4.1 UNIT OBJECTIVES

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

- Explain the significance of the cost of capital
 - Understand the concept of the opportunity cost of capital
 - Discuss cost of debt
 - Understand the concept of cost of preference capital
 - Discuss cost of equity capital and the dividend-growth model
 - Explain the Capital Asset Pricing model (CAPM)
 - Distinguish between CAPM and the dividend-growth model
 - Discuss the weighted average cost of capital (WACC)
 - Analyse flotation costs, cost of capital and investment
 - Describe the process of calculating the cost of capital in case of a real company
 - Discuss divisional and project cost of capital
-

4.2 SIGNIFICANCE OF THE COST OF CAPITAL

We should recognize that the cost of capital is one of the most difficult and disputed topics in the finance theory. Financial experts express conflicting opinions as to the correct way in which the cost of capital can be measured. Irrespective of the measurement problems, it is a concept of vital importance in the financial decision-making. It is useful as a standard for:

- Evaluating investment decisions
- Designing a firm's debt policy
- Appraising the financial performance of top management

Investment Evaluation

The primary purpose of measuring the cost of capital is its use as a financial standard for evaluating the investment projects. In the NPV method, an investment project is accepted if it has a positive NPV. The project's NPV is calculated by discounting its cash flows by the cost of capital. In this sense, the cost of capital is the discount rate used for evaluating the desirability of an investment project. In the IRR method, the investment project is accepted if it has an internal rate of return greater than the cost of capital. In this context, the cost of capital is the minimum required rate of return on an investment project. It is also known as the **cut-off rate** or the **hurdle rate**.

An investment project that provides a positive NPV when its cash flows are discounted by the cost of capital makes a *net* contribution to the wealth of shareholders. If the project has zero NPV, it means that its cash flows have yielded a return just equal to the cost of capital, and the acceptance or rejection of the project will not affect the wealth of shareholders. The **cost of capital** is the minimum required rate of return on the investment project that keeps the present wealth of shareholders unchanged. It may be, thus, noted that the cost of capital represents a financial standard for allocating the firm's funds, supplied by owners and creditors, to the various investment projects in the most efficient manner.

Designing Debt Policy

The debt policy of a firm is significantly influenced by the cost consideration. As we shall learn later on, debt helps to save taxes, as interest on debt is a tax-deductible expense. The interest tax shield reduces the overall cost of capital, though it also increases the financial risk of the firm. In designing the financing policy, that is, the proportion of debt and equity in the capital structure, the firm aims at maximizing the firm value by minimizing the overall cost of capital.

The cost of capital can also be useful in deciding about the methods of financing at a point of time. For example, cost may be compared in choosing between leasing and borrowing. Of course, equally important considerations are control and risk.¹

Performance Appraisal

The cost of capital framework can be used to evaluate the financial performance of top management.² Such an evaluation will involve a comparison of actual profitability of the investment projects undertaken by the firm with the projected overall cost of capital, and the appraisal of the actual costs incurred by management in raising the required funds.

The cost of capital also plays a useful role in dividend decision and investment in current assets.

4.3 THE CONCEPT OF THE OPPORTUNITY COST OF CAPITAL

Decision-making is a process of choosing among alternatives. In the investment decisions, an individual or a manager encounters innumerable competing investment opportunities to choose from. For example, you may invest your savings of ₹ 1,000 either in 7 per cent, 3 year postal certificates or in 6.5 per cent, 3 year fixed deposit in a nationalized bank. In both the cases, the government assures the payment, so the investment opportunities reflect equivalent risk. You decide to deposit your savings in the bank. By this action, you have foregone the opportunity of investing in the postal certificates. You have, thus, incurred an opportunity cost equal to the return on the foregone investment opportunity. It is 7 per cent in case of your investment. The opportunity cost is *the rate of return foregone on the next best alternative investment opportunity of comparable risk*. Thus, the required rate of return on an investment project is an opportunity cost.

Shareholders' Opportunities and Values

In the case of companies, there is a divorce between management and ownership. In an all-equity financed company, management makes investment decisions, but shareholders supply the capital. Therefore, a question may be raised: whose opportunity cost (or the required rate of return) should be considered in evaluating the investment projects? Since the firm's objective is to maximize the shareholder's wealth, the investment projects should be analyzed in terms of their values to shareholders. To appreciate this point, suppose you are the owner-manager of a firm. You make the investment decisions and you supply funds to finance the investment projects. You will use your required rate of return to evaluate the investment projects. Your required rate of return will depend on investment opportunities of equivalent risk available to you in the financial markets. Thus, the required rate of return (or the opportunity cost of capital) is market-determined rate.

NOTES

Check Your Progress

1. Define the firm's cost of capital.
2. Why is the cost of capital important?

NOTES

Suppose you appoint a manager to manage your business. She has the responsibility for the investment decisions. Whose opportunity cost should the manager use? Since you are the supplier of funds and you own the firm and the manager is acting on your behalf, you will require her to use your required rate of return in making investment decisions. If she is unable to earn returns equal to your required rate of return, you can ask her to return the money to you, which you can invest in securities in the financial markets and earn the required rate of return.

Assume that you convert your firm into a joint-stock company where you invite other shareholders to contribute the capital and share ownership with them. Now many shareholders own the firm. The manager should consider all owners' (shareholders') required rate of return in evaluating the investment decisions. If the manager is unable to earn the rates on the investment projects, which the shareholders could themselves earn on alternative investment opportunities, they will be within their rights to ask for returning their funds. Thus, management acts as an agent of shareholders. It should evaluate investment opportunities using the shareholders' opportunity cost; that is, the rate the shareholders would use if they were themselves appraising the investment opportunities. Hence, *in an all-equity financed firm, the equity capital of ordinary shareholders is the only source to finance investment projects, the firm's cost of capital is equal to the opportunity cost of equity capital, which will depend only on the business risk of the firm.*

Creditors' Claims and Opportunities

In practice, both shareholders and creditors (debt-holders) supply funds to finance a firm's investment projects. Investors hold different claims on the firm's assets and cash flows, and thus, they are exposed to different degrees of risk. Creditors have a priority claim over the firm's assets and cash flows. The firm is under a legal obligation to pay interest and repay principal. Debt holders are, however, exposed to the risk of default. Since the firm's cash flows are uncertain, there is a probability that it may default on its obligation to pay interest and principal. Preference shareholders hold claim prior to ordinary shareholders but after debt holders. Preference dividend is fixed and known, and the firm will pay it after paying interest but before paying any ordinary dividend. Because preference dividend is subordinated to interest, preference capital is more risky than debt. Ordinary shareholders supply capital, either in the form of retained earnings or by purchasing new shares. Unlike creditors, they are owners of the firm and retain its control. They delegate powers to management to make investment decisions on their behalf in such a way that their wealth is maximized. However, ordinary shareholders have claim on the residual assets and cash flows. The payment of ordinary dividend is discretionary. Ordinary shareholders may be paid dividends from cash remaining after interest and preference dividends have been paid. Also, the market price of ordinary share fluctuates more widely than that of the preference share and debt. Thus, ordinary share is more risky than both preference share and debt. Various forms of corporate debt can also be distinguished in terms of their differential riskiness. If we compare corporate bonds and government bonds, the latter are less risky since it is very unlikely that the government will default in its obligation to pay interest and principal.

Risk Differences in Shareholders' and Creditor Claims

Investors will require different rates of return on various securities since they have risk differences. Higher the risk of a security, the higher the rate of return demanded by investors. Since ordinary share is most risky, investors will require highest rate of return

NOTES

on their investment in ordinary shares. Preference share is more risky than debt; therefore, its required rate of return will be higher than that of debt. The risk-return relationship for various securities is shown in Figure 4.1. It may be observed in the figure that the required rate of return of any security is composed of two rates—a risk-free rate and a risk-premium. A risk-free will require compensation for time value and its risk-premium will be zero. Government securities, such as the treasury bills and bonds, are examples of the risk-free securities. Investors expect higher rates of return on risky securities. The higher the risk of a security, the higher will be its risk-premium and therefore, a higher required rate of return.

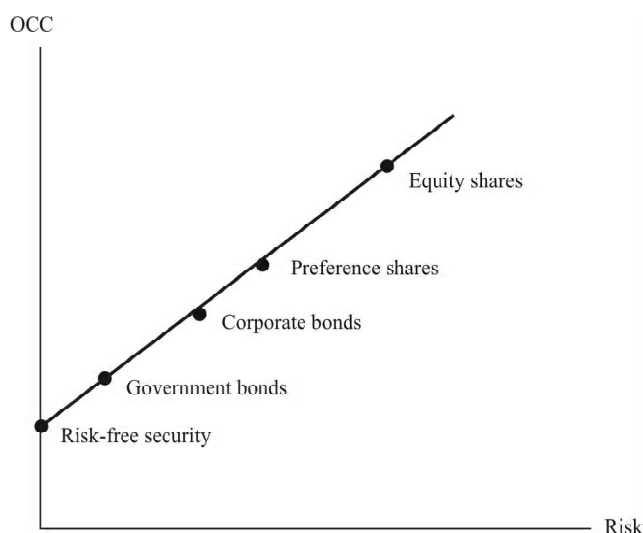


Fig. 4.1 Risk-return Relationships of Various Securities

Since the firm sells various securities to investors to raise capital for financing investment projects, it is, therefore, necessary that investment projects to be undertaken by the firm should generate *at least* sufficient net cash flow to pay investors—shareholders and debt holders—their required rates of return. In fact, investment projects should yield more cash flows than to just satisfy the investors' expectations, in order to make a net contribution to the wealth of ordinary shareholders. *Viewed from all investors' point of view, the firm's cost of capital is the rate of return required by them for supplying capital for financing the firm's investment projects by purchasing various securities.* It may be emphasized that the rate of return required by all investors will be an *overall rate of return—a weighted rate of return*. Thus, the firm's cost of capital is the 'average' of the opportunity costs (or required rates of return) of various securities, which have claims on the firm's assets. This rate reflects both the business (operating) risk and the financial risk resulting from debt capital. Recall that the cost of capital of an all-equity financed firm is simply equal to the ordinary shareholders' required rate of return, which reflects only the business risk.

General Formula for the Opportunity Cost of Capital

How does a firm know about the required rates of return of investors? The required rates of return are *market-determined*. They are established in the capital markets by the actions of competing investors. The influence of market is direct in the case of new issue of ordinary and preference shares and debt. The market price of securities is a function of the return expected by investors. The demand and supply forces work in

such a way that equilibrium rates are established for various securities. Thus, the opportunity cost of capital is given by the following formula:

$$I_0 = \frac{C_1}{(1+k)} + \frac{C_2}{(1+k)^2} + \dots + \frac{C_n}{(1+k)^n} \quad (1)$$

NOTES

where I_0 is the capital supplied by investors in period 0 (it represents a net cash inflow to the firm), C_n are returns expected by investors (they represent cash outflows to the firm) and k is the required rate of return or the cost of capital.

In terms of Equation (1), the cost of capital is the internal rate of return, which equates the present values of inflows and outflows of a financial opportunity.³ The outflows in Equation (1) represent the returns that investors could earn on the alternative investment opportunities of equivalent risk in the financial markets.

In the case of retained earnings, firms are not required to pay any dividends; no cash outflow takes place. Therefore, retained earnings have no explicit cost of capital. But they have a definite opportunity cost. The opportunity cost of retained earnings is the rate of return, which the ordinary shareholders would have earned on these funds if they had been distributed as dividends to them. The firm must earn a rate of return on retained funds which is at least equal to the rate that shareholders could earn on these funds to justify their retention.

Weighted Average Cost of Capital vs Specific Costs of Capital

A firm obtains capital from various sources. As explained earlier, because of the risk differences and the contractual agreements between the firm and investors, the cost of capital of each source of capital differs. The cost of capital of each source of capital is known as **component**, or **specific, cost of capital**. The combined cost of all sources of capital is called *overall*, or *average cost of capital*. The component costs are combined according to the weight of each component capital to obtain the average costs of capital. Thus, the overall cost is also called the **weighted average cost of capital** (WACC).

Suppose a firm has the cost of equity of 11 per cent and cost of debt of 6 per cent. In the beginning of the year, the firm considers Project A, which has an expected rate of return of 10 per cent. The firm decides to finance this project by debt. If the component cost of capital is used to evaluate Project A, the firm will accept it since its IRR (10 per cent) is greater than the component cost (6 per cent.). After some time, the company considers Project B, which has same risk as Project A and also has an expected rate of return of 10 per cent. The firm finds that Project A has exhausted its borrowings capacity, and hence, it will have to raise equity funds to finance Project B. Using the component cost of capital as the cut-off rate, the firm will reject Project B since its expected rate of return (10 per cent) is less than the component cost (11 per cent). Thus, out of two projects that are economically identical, the firm accepts one and rejects another simply because it associates the method of financing with the investment projects. What is wrong with this policy? It fails to consider the relationships between component costs. The various sources of capital are related to each other. The firm's decision to use debt in a given period reduces its future debt capacity as well as increases risk of shareholders. The shareholders will require a higher rate of return to compensate for the increased risk. Similarly, the firm's decision to use equity capital would enlarge its potential for borrowings in the future. Over the long run, the firm is expected to maintain a balance between debt and equity. The mix of debt and equity is called the firm's **capital structure**. Because of the connection between the sources of capital and the firm's desire to have

a **target capital structure** in the long run, it is generally agreed that the cost of capital should be used in the composite, overall sense.⁴ That is, in terms of the weighted average cost of capital.

The overall cost of capital is the weighted average cost of the various sources of capital. For example, if the long-run proportions of debt and equity in the above mentioned example respectively are 60 per cent and 40 per cent, then the combined cost of capital is: $0.06 \times 0.60 + 0.11 \times 0.40 = 0.08$ or 8 per cent. Thus, both Projects A and B should be accepted since each of them is expected to yield a rate of return higher than the overall cost of capital. Accepting both Projects A and B will maximize the shareholders' wealth.

In practice, firms do not use the same debt-equity mix to finance their capital expenditures every year. They raise funds in 'lumps'. They may issue bonds at one time and at another time, they may either issue ordinary shares or may use retained earnings. The target capital structure is a policy decision. Firms may not hold the target capital structure in a particular year. But they maintain it in the long run. Therefore, in spite of 'lumpy' financing by firms at different points in time, the overall cost of capital, rather than the component cost of capital, should be used in evaluating investment projects. It is not correct to associate a particular source of financing with a particular investment project.

Like the firm's WACC, we can also calculate the **project's WACC**. The debt capacity of the project may be different from the firm's overall debt capacity. Therefore, the capital structure of the project should be considered in calculating its WACC. In practice, financial managers, for convenience, may use the firm's capital structure to estimate the project's WACC.

You must remember that the relevant cost in the investment decisions is the **future cost** or the **marginal cost**. Marginal cost is the new or the incremental cost that the firm incurs if it were to raise capital now, or in the near future. The **historical cost** that was incurred in the past in raising capital is not relevant in financial decision-making. Historical costs may be significant to the extent that they help in predicting the future costs and in providing an evaluation of the past performance when compared with standard, or predetermined, costs.

Determining Component Costs of Capital

Generally, the component cost of a specific source of capital is equal to the investors' required rate of return, and it can be determined by using Equation (1). But the investors' required rate of return should be adjusted for taxes in practice for calculating the cost of a specific source of capital to the firm.⁵ In the investment analysis, net cash flows are computed on an after-tax basis, therefore, the component costs, used to determine the discount rate, should also be expressed on an after-tax basis.

4.4 COST OF DEBT

A company may raise debt in a variety of ways. It may borrow funds from financial institutions or public either in the form of public deposits or debentures (bonds) for a specified period of time at a certain rate of interest. A debenture or bond may be issued at par or at a discount or premium as compared to its face value. The contractual rate of interest or the coupon rate forms the basis for calculating the cost of debt.

NOTES

Check Your Progress

3. Define the concept of opportunity cost of capital.
4. What is weighted average cost of capital?
5. Define marginal cost.

NOTES

Debt Issued at Par

The before-tax cost of debt is the rate of return required by lenders. It is easy to compute before-tax cost of debt issued and to be redeemed at par; it is simply equal to the *contractual* (or *coupon*) *rate of interest*. For example, a company decides to sell a new issue of 7 year 15 per cent bonds of ₹ 100 each at par. If the company realizes the full face value of ₹ 100 bond and will pay ₹ 100 principal to bondholders at maturity, the before-tax cost of debt will simply be equal to the rate of interest of 15 per cent. Thus:

$$k_d = i = \frac{\text{INT}}{B_0} \quad (2)$$

where k_d is the before-tax cost of debt, i is the coupon rate of interest, B_0 is the issue price of the bond (debt) and in Equation (2) it is assumed to be equal to the face value (F), and INT is the amount of interest. The amount of interest payable to the lender is always equal to:

Interest = Face value of debt × Interest rate

The before-tax cost of bond in the example is:

$$k_d = \frac{\text{Rs } 15}{\text{Rs } 100} = 0.15 \quad \text{or} \quad 15\%$$

We could arrive at same results as above by using Equation (1): cash outflow are ₹ 15 interest per year for 7 years and ₹ 100 at the end of seventh year in exchange for ₹ 100 now. Thus:

$$\begin{aligned} 100 &= \frac{15}{(1+k_d)} + \frac{15}{(1+k_d)^2} + \frac{15}{(1+k_d)^3} + \frac{15}{(1+k_d)^4} \\ &\quad + \frac{15}{(1+k_d)^5} + \frac{15}{(1+k_d)^6} + \frac{15}{(1+k_d)^7} + \frac{100}{(1+k_d)^7} \\ 100 &= \sum_{t=1}^n \frac{15}{(1+k_d)^t} + \frac{100}{(1+k_d)^7} \\ 100 &= 15 (\text{PVFA}_{7, k_d}) + 100 (\text{PVF}_{7, k_d}) \end{aligned}$$

By trial and error, we find that the discount rate (k_d), which solves the equation, is 15 per cent:

$$100 = 15 (4.160) + 100 (0.376) = 62.40 + 37.60 = 100$$

Clearly, the before-tax cost of bond is the rate, which the investment should yield to meet the outflows to bondholders.

Debt Issued at Discount or Premium

Equations (1) and (2) will give identical results only when debt is issued at par and redeemed at par. Equation (1) can be rewritten as follows to compute the before-tax cost of debt:

$$B_0 = \sum_{t=1}^n \frac{\text{INT}_t}{(1+k_d)^t} + \frac{B_n}{(1+k_d)^n} \quad (3)$$

where B_n is the repayment of debt on maturity and other variables as defined earlier.⁶ Equation (3) can be used to find out the cost of debt whether debt is issued at par or discount or premium, i.e., $B_0 = F$ or $B_0 > F$ or $B_0 < F$. Let us consider an example.

Illustration 4.1: Cost of a Bond Sold at Discount

Assume that in the preceding example of 7 year 15 per cent bonds, each bond is sold below par for ₹ 94. Using Equation (3), k_d is calculated as:

$$94 = \sum_{t=1}^7 \frac{15}{(1+k_d)^t} + \frac{100}{(1+k_d)^7}$$

$$94 = 15(\text{PVF } A_{7, k_d}) + 100(\text{PVF}_{7, k_d})$$

By trial and error, $k_d = 16.5$ per cent. Let us try 17%:

$$15(3.922) + 100(0.333)$$

$$58.83 + 33.30 = 91.13 < 94$$

Since PV at 17% is less than the required PV (₹ 94), let us try 16%:

$$= 15(4.038) + 100(0.354) = 60.57 + 35.40 = 95.97 > 94$$

The discount rate k_d should lie between 16 – 17%. By interpolation, we find:

PV required	94.00	
		1.97
PV at 16%	95.97	
		3.84
PV at 17%	92.13	

$$k_d = 16\% + (17\% - 16\%) \frac{1.97}{3.84} = 16.5\%$$

$k_d = 16.5$ per cent, Equation (3) is satisfied

$$94 = 15(3.980) + 100(0.343) = 59.70 + 34.30 = 94$$

If the discount or premium is adjusted for computing taxes, the following short-cut method can also be used to calculate the before-tax cost of debt:

$$k_d = \frac{\text{INT} + \frac{1}{n} (F - B_0)}{\frac{1}{2} (F + B_0)} \quad (4)$$

Thus, using data of Illustration 4.1, we obtain:

$$k_d = \frac{15 + \frac{1}{7}(100 - 94)}{\frac{1}{2}(100 + 94)} = \frac{15.86}{97} = 0.164 \quad \text{or} \quad 16.4\%$$

Note that the short-cut method gives approximately the same result as Equation (3). The principal drawback of the method is that it does not consider the sinking fund payments or the annual compounding.⁷

It should be clear from the preceding discussion that the before-tax cost of bond to the firm is affected by the issue price. The lower the issue price, the higher will be the before-tax cost of debt. The highly successful companies may sell bond or debenture at a premium ($B_0 > F$); this will pull down the before-tax cost of debt.

NOTES

NOTES

Tax Adjustment

The interest paid on debt is tax deductible. The higher the interest charges, lower will be the amount of tax payable by the firm. This implies that the government indirectly pays a part of the lender's required rate of return. As a result of the **interest tax shield**, the after-tax cost of debt to the firm will be substantially less than the investors' required rate of return. The before-tax cost of debt, k_d , should, therefore, be adjusted for the tax effect as follows:

$$\text{After-tax cost of debt} = k_d (1 - T) \quad (5)$$

where T is the corporate tax rate. If the before-tax cost of bond in our example is 16.5 per cent, and the corporate tax rate is 35 assumed per cent,⁸ the after-tax cost of bond will be:

$$k_d(1 - T) = 0.1650 (1 - 0.35) = 0.1073 \quad \text{or } 10.73\%$$

It should be noted that the tax benefit of interest deductibility would be available only when the firm is profitable and is paying taxes. An unprofitable firm is not required to pay any taxes. It would not gain any tax benefit associated with the payment of interest, and its true cost of debt is the before-tax cost.

It is important to remember that in the calculation of the average cost of capital, the after-tax cost of debt must be used, not the before-tax cost of debt.

Illustration 4.2: Cost of a Bond Sold at Discount and Redeemable at Premium

A 7 year, ₹ 100 debenture of a firm can be sold for a net price of ₹ 97.75. The rate of interest is 15 per cent per year, and bond will be redeemed at 5 per cent premium on maturity. The firm's tax rate is 35 per cent. Compute the after-tax cost of debenture.

The annual interest will be: $F \times i = ₹ 100 \times 0.15 = ₹ 15$, and maturity price will be: $₹ 100 (1.05) = ₹ 105$. We can use Equation (3) to compute the after-tax cost of debenture:

$$97.75 = \sum_{t=1}^n \frac{15}{(1 + k_d)^t} + \frac{105}{(1 + k_d)^7}$$

By trial and error, we find:

$$k_d = 16\% : 15(4.038) + 105(0.354) = 97.75$$

The after-tax cost of debenture will be:

$$k_d(1 - T) = 0.16(1 - 0.35) = 0.104 \quad \text{or } 10.4\%$$

Cost of Existing Debt

Sometimes a firm may like to compute the 'current' cost of its existing debt. In such a case, the cost of debt should be approximated by the current market yield of the debt. Suppose that a firm has 11 per cent debentures of ₹ 100,000 (₹ 100 face value) outstanding at 31 December 2009 to be matured on 31 December 2014. If a new issue of debentures could be sold at a net realizable price of ₹ 80 in the beginning of 2010, the cost of the existing debt, using short-cut method (Equation 4), will be

$$k_d = \frac{11 + 1/5(100 - 80)}{1/2(100 + 80)} = \frac{15}{90} = 0.167 \quad \text{or } 16.7\%$$

If $T = 0.35$, the after-tax cost of debt will be:

$$k_d(1 - T) = 0.167(1 - 0.35) = 0.109 \quad \text{or } 10.9\%$$

4.5 COST OF PREFERENCE CAPITAL

The measurement of the cost of preference capital poses some conceptual difficulty. In the case of debt, there is a binding legal obligation on the firm to pay interest, and the interest constitutes the basis to calculate the cost of debt. However, in the case of preference capital, payment of dividends is not legally binding on the firm and even if the dividends are paid, it is not a *charge* on earnings; rather it is a distribution or *appropriation* of earnings to preference shareholders. One may, therefore, be tempted to conclude that the dividends on preference capital do not constitute cost. This is not true.

The cost of preference capital is a function of the dividend *expected* by investors. Preference capital is never issued with an intention not to pay dividends. Although it is not legally binding upon the firm to pay dividends on preference capital, yet it is generally paid when the firm makes sufficient profits. The failure to pay dividends, although does not cause bankruptcy, yet it can be a serious matter from the ordinary shareholders' point of view. The non-payment of dividends on preference capital may result in voting rights and control to the preference shareholders. More than this, the firm's credit standing may be damaged. The accumulation of preference dividend arrears may adversely affect the prospects of ordinary shareholders for receiving any dividends, because dividends on preference capital represent a prior claim on profits. As a consequence, the firm may find difficulty in raising funds by issuing preference or equity shares. Also, the market value of the equity shares can be adversely affected if dividends are not paid to the preference shareholders and, therefore, to the equity shareholders. For these reasons, dividends on preference capital should be paid regularly except when the firm does not make profits or it is in a very tight cash position.

Irredeemable Preference Share

The preference share may be treated as a perpetual security if it is irredeemable.⁹ Thus, its cost is given by the following equation:

$$k_p = \frac{\text{PDIV}}{P_0} \quad (6)$$

where k_p is the cost of preference share, PDIV is the expected preference dividend, and P_0 is the issue price of preference share.

Illustration 4.3: Cost of Irredeemable Preference Share

A company issues 10 per cent irredeemable preference shares. The face value per share is ₹ 100, but the issue price is ₹ 95. What is the cost of a preference share? What is the cost if the issue price is ₹ 105?

We can compute cost of a preference share as follows:

Issue price ₹ 95:

$$k_p = \frac{\text{PDIV}}{P_0} = \frac{10}{95} = 0.1053 \text{ or } 10.53\%$$

Issue price ₹ 105:

$$k_p = \frac{\text{PDIV}}{P_0} = \frac{10}{105} = 0.0952 \text{ or } 9.52\%$$

NOTES

Check Your Progress

6. How is the cost of debt calculated?
7. What forms the basis of calculating the cost of debt?

Redeemable Preference Share

Redeemable preference shares (that is, preference shares with finite maturity) are also issued in practice. A formula similar to Equation (3) can be used to compute the cost of redeemable preference share:

$$P_0 = \sum_{t=1}^n \frac{\text{PDIV}_t}{(1+k_p)^t} + \frac{P_n}{(1+k_p)^n} \quad (7)$$

The cost of preference share is not adjusted for taxes because preference dividend is paid after the corporate taxes have been paid. Preference dividends do not save any taxes.¹⁰ Thus, the cost of preference share is automatically computed on an after-tax basis. Since interest is tax deductible and preference dividend is not, the after-tax cost of preference share is substantially higher than the after-tax cost of debt.

NOTES

4.6 COST OF EQUITY CAPITAL

Firms may raise equity capital internally by retaining earnings. Alternatively, they could distribute the entire earnings to equity shareholders and raise equity capital externally by issuing new shares. In both cases, shareholders are providing funds to the firms to finance their capital expenditures. Therefore, the equity shareholders' required rate of return would be the same whether they supply funds by purchasing new shares or by foregoing dividends, which could have been distributed to them. There is, however, a difference between retained earnings and issue of equity shares from the firm's point of view. The firm may have to issue new shares at a price lower than the current market price. Also, it may have to incur flotation costs. Thus, **external equity** will cost more to the firm than the **internal equity**.

Is Equity Capital Free of Cost?

It is sometimes argued that the equity capital is free of cost. The reason for such argument is that it is not legally binding for firms to pay dividends to ordinary shareholders. Further, unlike the interest rate or preference dividend rate, the equity dividend rate is not fixed. It is fallacious to assume equity capital to be free of cost. As we have discussed earlier, equity capital involves an *opportunity cost*; ordinary shareholders supply funds to the firm in the expectation of dividends and capital gains commensurate with their risk of investment. The market value of the shares, determined by the demand and supply forces in a well functioning capital market, reflects the return required by ordinary shareholders. Thus, the shareholders' required rate of return, which equates the present value of the expected dividends with the market value of the share, is the cost of equity. The cost of external equity would, however, be more than the shareholders' required rate of return if the issue price were different from the market price of the share.

In practice, it is a formidable task to measure the cost of equity. The difficulty derives from two factors: First, it is very difficult to estimate the expected dividends. Second, the future earnings and dividends are expected to grow over time. Growth in dividends should be estimated and incorporated in the computation of the cost of equity. The estimation of growth is not an easy task. Keeping these difficulties in mind, the methods of computing the cost of internal and external equity are discussed below.

Check Your Progress

8. Define preference share.
9. What is redeemable preference share?
10. State the reason behind not adjusting the cost of preference for taxes.

Cost of Internal Equity: The Dividend-growth Model

A firm's internal equity consists of its retained earnings. The opportunity cost of the retained earnings is the rate of return foregone by equity shareholders. The shareholders generally expect dividend and capital gain from their investment. The required rate of return of shareholders can be determined from the dividend valuation model.¹¹

Normal growth: The dividend-valuation model for a firm whose dividends are expected to grow at a constant rate of g is as follows:

$$P_0 = \frac{DIV_1}{k_e - g} \quad (8)$$

$$\text{where } DIV_1 = DIV_0 (1 + g).$$

Equation (8) can be solved for calculating the cost of equity k_e as follows:

$$k_e = \frac{DIV_1}{P_0} + g \quad (9)$$

The cost of equity is, thus, equal to the expected dividend yield (DIV_1/P_0) plus capital gain rate as reflected by expected growth in dividends (g). It may be noted that Equation (9) is based on the following assumptions:¹²

- The market price of the ordinary share, P_0 , is a function of expected dividends.
- The dividend, DIV_1 , is positive (i.e., $DIV_1 > 0$).
- The dividends grow at a constant growth rate g , and the growth rate is equal to the return on equity, ROE, times the retention ratio, b (i.e., $g = ROE \times b$).
- The dividend payout ratio [i.e., $(1 - b)$] is constant.

The cost of retained earnings determined by the dividend-valuation model implies that if the firm would have distributed earnings to shareholders, they could have invested it in the shares of the firm or in the shares of other firms of similar risk at the market price (P_0) to earn a rate of return equal to k_e . Thus, the firm should earn a return on retained funds equal to k_e to ensure growth of dividends and share price. If a return less than k_e is earned on retained earnings, the market price of the firm's share will fall. It may be emphasized again that the cost of retained earnings will be equal to the shareholders' required rate of return since no flotation costs are involved.

Illustration 4.4: Constant-Growth Model and the Cost of Equity

Suppose that the current market price of a company's share is ₹ 90 and the expected dividend per share next year is ₹ 4.50. If the dividends are expected to grow at a constant rate of 8 per cent, the shareholders' required rate of return is:

$$k_e = \frac{DIV_1}{P_0} + g$$

$$k_e = \frac{\text{Rs } 4.50}{\text{Rs } 90} + 0.08 = 0.05 + 0.08 = 0.13 \text{ or } 13\%$$

If the company intends to retain earnings, it should at least earn a return of 13 per cent on retained earnings to keep the current market price unchanged.

Supernormal growth: A firm may pass through different phases of growth. Hence, dividends may grow at different rates in the future. The growth rate may be very high for a few years, and afterwards, it may become normal, indefinitely, in the future. The

NOTES

NOTES

dividend-valuation model can also be used to calculate the cost of equity under different growth assumptions. For example, if the dividends are expected to grow at a super-normal growth rate, g_s , for n years and thereafter, at a normal, perpetual growth rate of, g_n , beginning in year $n + 1$, then the cost of equity can be determined by the following formula:

$$P_0 = \sum_{t=1}^n \frac{DIV_0 (1 + g_s)^t}{(1 + k_e)^t} + \frac{P_n}{(1 + k_e)^n} \quad (10)$$

P_n is the discounted value of the dividend stream, beginning in year $n + 1$ and growing at a constant, perpetual rate g_n , at the end of year n , and therefore it is equal to:

$$P_n = \frac{DIV_{n+1}}{k_e - g_n} \quad (11)$$

When we multiply P_n by $1/(1 + k_e)^n$ we obtain the present value of P_n in year 0. Substituting Equation (11) in Equation (10), we get:

$$P_0 = \sum_{t=1}^n \frac{DIV_0 (1 + g_s)^t}{(1 + k_e)^t} + \frac{DIV_{n+1}}{k_e - g_n} \times \frac{1}{(1 + k_e)^n} \quad (12)$$

The cost of equity, k_e , can be computed by solving Equation (12) by trial and error.

Illustration 4.5: Cost of Equity: Two-Stage Growth

Assume that a company's share is currently selling for ₹ 134. Current dividends, DIV_0 are ₹ 3.50 per share and are expected to grow at 15 per cent over the next 6 years and then at a rate of 8 per cent forever. The company's cost of equity can be found out as follows:

$$\begin{aligned} 134 &= \sum_{t=1}^6 \frac{3.50(1.15)^t}{(1 + k_e)^t} + \frac{DIV_7}{(k_e - 0.08)} \times \frac{1}{(1 + k_e)^6} \\ &= \left[\frac{4.03}{(1 + k_e)} + \frac{4.63}{(1 + k_e)^2} + \frac{5.33}{(1 + k_e)^3} \right. \\ &\quad \left. + \frac{6.13}{(1 + k_e)^4} + \frac{7.05}{(1 + k_e)^5} + \frac{8.11}{(1 + k_e)^6} \right] + \frac{8.11(1.08)}{(k_e - 0.08)} \times \frac{1}{(1 + k_e)^6} \\ &= 4.03(PV A_{1, k_e}) + 4.63(PV A_{2, k_e}) + 5.33(PV A_{3, k_e}) \\ &\quad + 6.13(PV A_{4, k_e}) + 7.05(PV A_{5, k_e}) + 8.11(PV A_{6, k_e}) \\ &\quad + \frac{8.76}{k_e - 0.08} (PV A_{6, k_e}) \end{aligned}$$

By trial and error, we find that $k_e = 0.12$ or 12 per cent:

$$\begin{aligned} 134 &= 4.03(0.893) + 4.63(0.797) + 5.33(0.712) + 6.13(0.636) \\ &\quad + 7.05(0.567) + 8.11(0.507) + \frac{8.76}{0.12 - 0.08} (0.507) \end{aligned}$$

Zero-growth: In addition to its use in constant and variable growth situations, the dividend valuation model can also be used to estimate the cost of equity of no-growth companies. The cost of equity of a share on which a constant amount of dividend is expected perpetually is given as follows:

$$k_e = \frac{DIV_1}{P_0} \quad (13)$$

The growth rate g will be zero if the firm does not retain any of its earnings; that is, the firm follows a policy of 100 per cent payout. Under such case, dividends will be equal to earnings, and therefore Equation (13) can also be written as:

$$k_e = \frac{DIV_1}{P_0} = \frac{EPS_1}{P_0} \quad (\text{since } g = 0) \quad (14)$$

which implies that in a no-growth situation, the expected earnings–price (E/P) ratio may be used as the measure of the firm’s cost of equity.

Cost of External Equity: The Dividend-growth Model

The firm’s external equity consists of funds raised externally through public or right issues. The minimum rate of return, which the equity shareholders require on funds supplied by them by purchasing new shares to prevent a decline in the existing market price of the equity share, is the cost of external equity. The firm can induce the existing or potential shareholders to purchase new shares when it promises to earn a rate of return equal to:

$$k_e = \frac{DIV_1}{P_0} + g$$

Thus, the shareholders’ required rate of return from retained earnings and external equity is the same. The cost of external equity is, however, greater than the cost of internal equity for one reason. The selling price of the new shares may be less than the market price. In India, the new issues of ordinary shares are generally sold at a price less than the market price prevailing at the time of the announcement of the share issue. Thus, the formula for the cost of new issue of equity capital may be written as follows:

$$k_e = \frac{DIV_1}{P_I} + g \quad (15)$$

where P_I is the issue price of new equity. The cost of retained earnings will be less than the cost of new issue of equity if $P_0 > P_I$.

Illustration 4.6: Cost of Internal and External Equity

The share of a company is currently selling for ₹ 100. It wants to finance its capital expenditures of ₹ 100 million either by retaining earnings or selling new shares. If the company sells new shares, the issue price will be ₹ 95. The dividend per share next year, DIV_1 , is ₹ 4.75 and it is expected to grow at 6 per cent. Calculate (i) the cost of internal equity (retained earnings) and (ii) the cost of external equity (new issue of shares).

Equation (9) can be used to calculate the cost of internal equity:

$$k_e = \frac{\text{Rs } 4.75}{\text{Rs } 100} + 0.06 = 0.0475 + 0.06 = 0.1075 \text{ or } 10.75\%$$

The cost of external equity can be calculated as follow:

$$k_e = \frac{\text{Rs } 4.75}{\text{Rs } 95} + 0.06 = 0.05 + 0.06 = 0.11 \text{ or } 11\%$$

NOTES

It is obvious that the cost of external equity is greater than the cost of internal equity because of the under-pricing (cost of external equity = 11 per cent > cost of internal equity = 10.75 per cent).

NOTES

Earnings–Price Ratio and the Cost of Equity

As a general rule, it is not theoretically correct to use the ratio of earnings to price as a measure of the cost of equity. The earnings–price (E/P) ratio does not reflect the true expectations of the ordinary shareholders. For example, if the current market price of a share is ₹ 500 (face value being ₹ 100) and the earning per share is ₹ 10, the E/P ratio will be: ₹ 10 ÷ ₹ 500 = 0.02 or 2 per cent. Does this mean that the expectation of shareholders is 2 per cent? They would, in fact, expect to receive a stream of dividends and a final price of the share that would result in a return significantly greater than the E/P ratio. Thus, the dividend valuation model gives the most of valid measure of the cost of equity.

There are exceptions, however. One exception that we have already pointed out is the no-growth firms. The cost of equity in the case of the no-growth firms is equal to the expected E/P ratio:

$$\begin{aligned} k_e &= \frac{DIV_1}{P_0} + g \\ &= \frac{EPS_1(1-b)}{P_0} + br & (\because g = br) \\ &= \frac{EPS_1}{P_0} & (\because b = 0) \end{aligned}$$

where b is the earnings retention rate, EPS_1 is the expected earnings per share and r is the return investment (equity).

Another situation where the expected earnings–price ratio may be used as a measure of the cost of equity is *expansion*, rather than *growth* faced by the firm. A firm is said to be *expanding*, not *growing*, if the investment opportunities available to it are expected to earn a rate of return equal to the cost of equity.¹³ For example, Equation (9) may be written as follows:

$$P_0 = \frac{EPS_1(1-b)}{(k_e - rb)} \quad (16)$$

If $r = k_e$, then

$$P_0 = \frac{EPS_1(1-b)}{(k_e - k_e b)} = \frac{EPS_1(1-b)}{k_e(1-b)} = \frac{EPS_1}{k_e}$$

and solving for k_e , we get $k_e = \frac{EPS_1}{P_0}$

Illustration 4.7: Earnings–Price Ratio and the Cost of Equity

A firm is currently earning ₹ 100,000 and its share is selling at a market price of ₹ 80. The firm has 10,000 shares outstanding and has no debt. The earnings of the firm are expected to remain stable, and it has a payout ratio of 100 per cent. What is the cost of equity? If the firm's payout ratio is assumed to be 60 per cent and that it earns 15 per

cent rate of return on its investment opportunities, then, what would be the firm's cost of equity?

In the first case, since expected growth rate is zero, we can use expected earnings–price ratio to compute the cost of equity. Thus:

$$k_e = \frac{\text{Rs } 10}{\text{Rs } 80} = 0.125 \text{ or } 12.5\%$$

The earnings per share are ₹ 100,000, 10,000 = ₹ 10. If the firm pays out 60 per cent of its earnings, the dividends per share will be: ₹ 10 × 0.6 = ₹ 6, and the retention ratio will be 40 per cent. If the expected return on internal investment opportunities is 15 per cent, then the firm's expected growth is: $0.40 \times 0.15 = 0.06$ or 6 per cent. The firm's cost of equity will be:

$$k_e = \frac{\text{Rs } 6}{\text{Rs } 80} + 0.06 = 0.075 + 0.06 = 0.135 \text{ or } 13.5\%$$

4.7 COST OF EQUITY AND THE CAPITAL ASSET PRICING MODEL (CAPM)

The Capital Asset Pricing Model (CAPM) provides an alternative approach for the calculation of the cost of equity. As per the CAPM, the required rate of return on equity is given by the following relationship:

$$k_e = R_f + (R_m - R_f)\beta_j \quad (17)$$

Equation (17) requires the following three parameters to estimate a firm's cost of equity:

- **Risk-free rate (R_f):** The yields on the government Treasury securities are used as the risk-free rate. You can use returns either on the short-term or the long-term Treasury securities. It is a common practice to use the return on the short-term Treasury bills as the risk-free rate. Since investments are long-term decisions, many analysts prefer to use yields on long-term government bonds as the risk-free rate. You should always use the current risk-free rate rather than the historical average.
- **Market risk premium ($R_m - R_f$):** The market risk premium is measured as the difference between the long-term, historical arithmetic averages of market return and the risk-free rate. Some people use a market risk premium based on returns of the most recent years. This is not a correct procedure since the possibility of measurement errors and variability in the short-term, recent data is high. If you use the current long-term government bonds as the risk-free rate, then the market risk premium should also be based on the historical average return of the long-term bond. On the other hand, if you use the current yield on long-term government bonds as the risk-free rate, then the market risk premium should also be based on the historical average yield of long-term government bonds. You should be consistent; you should match the estimation of the market risk premium with the maturity of the security used as the risk-free rate.
- **Beta of the firm's share (β):** Beta (β) is the systematic risk of an ordinary share in relation to the market. The share returns are regressed to the market

NOTES

Check Your Progress

11. Is equity cost free?
12. Can you use earnings–price ratio as the cost of equity?

NOTES

returns to estimate beta. A broad-based index like the BSE's Sensitivity Index (Sensex) is used as a proxy for the market.

Suppose in the year 2002 the risk-free rate is 6 per cent, the market risk premium is 9 per cent and beta of L&T's share is 1.54. The cost of equity for L&T is:

$$k_{L\&T} = 0.06 + 0.09 \times 1.54 = 0.1986 \approx 20\%$$

4.8 COST OF EQUITY: CAPM VERSUS DIVIDEND-GROWTH MODEL

The dividend-growth approach has limited application in practice because of its two assumptions. First, it assumes that the dividend per share will grow at a constant rate, g , forever. Second, the expected dividend growth rate, g , should be less than the cost of equity, k_e , to arrive at the simple growth formula. That is:

$$k_e = \frac{DIV_1}{P_0} + g$$

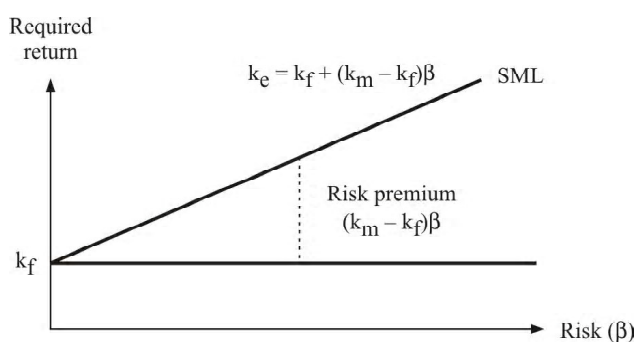


Fig. 4.2 Cost of equity under CAPM

These assumptions imply that the dividend-growth approach cannot be applied to those companies, which are not paying any dividends, or whose dividend per share is growing at a rate higher than k_e , or whose dividend policies are highly volatile. The dividend-growth approach also fails to deal with risk directly. In contrast, the CAPM has a wider application although it is based on restrictive assumptions. The only condition for its use is that the company's share is quoted on the stock exchange. Also, all variables in the CAPM are market determined and except the company specific share price data, they are common to all companies. The value of beta is determined in an objective manner by using sound statistical methods. One practical problem with the use of beta, however, is that it does not normally remain stable over time.

4.9 THE WEIGHTED AVERAGE COST OF CAPITAL

Once the component costs have been calculated, they are multiplied by the proportions of the respective sources of capital to obtain the weighted average cost of capital (WACC). The proportions of capital must be based on target capital structure. WACC is the composite, or overall cost of capital. You may note that it is the weighted average concept, not the simple average, which is relevant in calculating the overall cost of capital. The simple average cost of capital is not appropriate to use because firms hardly use various sources of funds equally in the capital structure.

The following steps are involved for calculating the firm's WACC:

- Calculate the cost of specific sources of funds
- Multiply the cost of each source by its proportion in the capital structure
- Add the weighted component costs to get the WACC

In financial decision-making, the cost of capital should be calculated on an after-tax basis. Therefore, the component costs should be the after-tax costs. If we assume that a firm has only debt and equity in its capital structure, then the WACC (k_0) will be:

$$k_0 = k_d(1-T)w_d + k_e w_e$$

$$k_0 = k_d(1-T)\frac{D}{D+E} + k_e \frac{E}{D+E} \quad (18)$$

where k_0 is the WACC, $k_d(1-T)$ and k_e are, respectively, the after-tax cost of debt and equity, D is the amount of debt and E is the amount of equity. In a general form, the formula for calculating WACC can be written as follows:

$$k_0 = k_1 w_1 + k_2 w_2 + k_3 w_3 + \dots \quad (19)$$

where $k_1, k_2, \dots$ are component costs and $w_1, w_2, \dots$ weights of various types of capital, employed by the company.

Weighted marginal cost of capital (WMCC): Marginal cost is the new or the incremental cost of new capital (equity and debt) issued by the firm. We assume that new funds are raised at new costs according to the firm's target capital structure. Hence, what is commonly known as the WACC is in fact the weighted marginal cost of capital (WMCC); that is, the *weighted average cost of new capital given, the firm's target capital structure*.

Book Value vs Market Value Weights

You should always use the **market value weights** to calculate WACC. In practice, firms do use the book value weights. Generally, there will be difference between the book value and market value weights, and therefore, WACC will be different. WACC, calculated using the book-value weights, will be understated if the market value of the share is higher than the book value and vice versa.

Illustration 4.8: Weighted Average Cost of Capital

Lohia Chemicals Ltd has the following book value capital structure on 31 March 2004:

Source of Finance	Amount (₹ 000)	Proportion (%)
Share capital	450,000	45
Reserves and surplus	150,000	15
Preference share capital	100,000	10
Debt	300,000	30
	1,000,000	100

The expected after-tax component costs of the various sources of finance for Lohia Chemicals Ltd are as follows:

Source	Cost (%)
Equity	18.0
Reserve and surplus	18.0
Preference share capital	11.0
Debt	8.0

NOTES

The weighted average cost of capital of Lohia Chemicals Ltd, based on the existing capital structure, is computed in Table 4.1.

Table 4.1 *Computation of Weighted Average Cost of Capital*

Source (1)	Amount (₹ 000) (2)	Proportion (%) (3)	After-tax Cost (%) (4)	Weighted Cost (%) (5 = 3 × 4)
Equity capital	450,000	45	18	8.1
Reserves & surplus	150,000	15	18	2.7
Preference capital	100,000	10	11	1.1
Debt	300,000	30	8	2.4
	<u>1,000,000</u>	<u>100</u>	WACC	<u>14.3</u>

Suppose Lohia Chemicals Ltd has 45,000,000 equity shares outstanding and that the current market price per share is ₹ 20. Assume that the market values and the book values of debt and the preference share capital are the same. If the component costs were the same as before, the market value weighted average cost of capital would be about 15 per cent:

Table 4.2 *Computation of Weighted Average Cost of Capital (Market-value Weights)*

Source (1)	Amount (₹ 000) (2)	Proportion (%) (3)	After-tax Cost (%) (4)	Weighted Cost (%) (5 = 3 × 4)
Equity capital	900,000	69.2	18	12.5
Preference capital	100,000	7.7	11	0.8
Debt	300,000	23.1	8	1.8
	<u>1,300,000</u>	<u>100.1</u>	WACC	<u>15.1</u>

It should be noticed that the equity capital for Lohia Chemicals Ltd is the total market value of the ordinary shares outstanding, which includes retained earnings (reserves). It is obvious that the market value weighted cost of capital (15.1 per cent) is higher than the book value weighted cost of capital (14.3 per cent), because the market value of equity share capital (₹ 900,000,000) is higher than its book value (₹ 600,000,000).

Why do managers prefer the book value weights for calculating WACC? Besides the simplicity of the use, managers claim following advantages for the book value weights:

- Firms in practice set their target capital structure in terms of book values.
- The book value information can be easily derived from the published sources.
- The book value debt-equity ratios are analysed by investors to evaluate the risk of the firms in practice.

The use of the book-value weights can be seriously questioned on theoretical grounds. First, the component costs are opportunity rates and are determined in the capital markets. The weights should also be market-determined. Second, the book-value weights are based on arbitrary accounting policies that are used to calculate retained earnings and value of assets. Thus, they do not reflect economic values. It is very difficult to justify the use of the book-value weights in theory.

Market-value weights are theoretically superior to book-value weights. They reflect economic values and are not influenced by accounting policies. They are also consistent with the market-determined component costs. The difficulty in using market-value weights

NOTES

is that the market prices of securities fluctuate widely and frequently. A market value based target capital structure means that the amounts of debt and equity are continuously adjusted as the value of the firm changes.

4.10 FLOTATION COSTS, COST OF CAPITAL AND INVESTMENT ANALYSIS

NOTES

A new issue of debt or shares will invariably involve **flotation costs** in the form of legal fees, administrative expenses, brokerage or underwriting commission. One approach is to adjust the flotation costs in the calculation of the cost of capital. Let us take an example to illustrate the point.

Suppose that a firm is considering an investment project, which involves a net cash outlay of ₹ 450,000, and that it is expected to generate an annual net cash inflow of ₹ 150,000 for 7 years. The project's target debt ratio is 50 per cent. The flotation costs of debt and share issues are estimated at 10 per cent of the amount raised. To finance the project, the firm will issue 7-year 15 per cent debentures of ₹ 250,000 at par (₹ 100 face value), and new shares of ₹ 250,000. The issue price of a share is ₹ 20 and the expected dividend per share next year is ₹ 1.80. Dividends are expected to grow at a compound rate of 7 per cent forever. Assume that corporate tax rate is 50 per cent. What is the NPV of the project?

The project's NPV can be calculated using WACC adjusted for flotation costs as the discount rate. Under this procedure, the before-tax cost of debt is given by the following equation:

$$B_0(1-f) = \sum_{t=1}^n \frac{INT_t + B_t}{(1+k_d)^t} \quad (20)$$

and the cost of equity as follows:

$$k_e = \frac{DIV_1}{P_0(1-f)} + g \quad (21)$$

where f is the fraction of flotation costs. Thus, before-tax cost of debt in the example will be:

$$100(1-0.10) = \sum_{t=1}^7 \frac{15}{(1+k_d)^t} + \frac{100}{(1+k_d)^7}$$

By trial and error, we find $k_d = 17.6$ per cent. If tax rate is 50 per cent, the after-tax cost of debt will be: $0.176(1-0.50) = 0.088$ or 8.8 per cent. The cost of equity will be as follows:

$$k_e = \frac{\text{Rs } 1.80}{\text{Rs } 20(1-0.1)} + 0.07 = 0.10 + 0.07 = 0.17 \text{ or } 17\%$$

The 'flotation-costs adjusted' weighted average cost of capital will be:

$$k_o = 0.088 \times 0.50 + 0.17 \times 0.50 = 0.13 \text{ or } 13\%$$

The NPV of the investment project using the discount rate of 13 per cent is:

$$\begin{aligned}\text{NPV} &= -450,000 + \sum_{t=1}^7 \frac{150,000}{(1.13)^t} \\ &= -450,000 + 150,000 \times 4.423 = \text{Rs } 213,450\end{aligned}$$

NOTES

This is not a correct procedure. Flotation costs are *not* annual costs; they are *one-time costs* incurred when the investment project is undertaken and financed. If the cost of capital is adjusted for the flotation costs and used as the discount rate, the effect of the flotation costs will be compounded over the life of the project. Thus, the net present value of the investment project will be biased. The correct procedure is to adjust the investment project's cash flows for the flotation costs and use the weighted average cost of capital, unadjusted for the flotation costs, as the discount rate.¹⁴ Since the flotation costs are incurred at the time the investment project is financed, they can be added to the project's initial cost. The flotation costs in the example are: $0.1 (2,50,000 + 2,50,000) = ₹ 50,000$. Thus, the net cash outlay of the project will be ₹ 500,000. Since the component costs are *not* adjusted for flotation costs, the after-cost of debt will be: $0.15 (1 - 0.5) = 0.075$ or 7.5 per cent and the cost of equity will be

$$k_e = \frac{\text{Rs } 1.80}{\text{Rs } 20} + 0.07 = 0.09 + 0.07 = 0.16 \text{ or } 16 \text{ per cent}$$

WACC, without the adjustment of floatation costs, will be

$$k_o = 0.075 \times 0.5 + 0.16 \times 0.5 = 0.12 \text{ or } 12\%$$

The NPV of the investment project will be:

$$\begin{aligned}\text{NPV} &= -500,000 + \sum_{t=1}^7 \frac{150,000}{(1.12)^t} \\ &= -500,000 + 150,000 \times 4.564 \\ &= \text{Rs } 184,600\end{aligned}$$

The project's NPV in the example is overstated when we adjust flotation costs in computing the discount rate.

In some situations, it may not be possible to exactly apportion flotation costs to given projects, particularly when the firm raises large amount of capital for unidentified future investments.

4.11 CALCULATION OF THE COST OF CAPITAL IN PRACTICE: CASE OF LARSEN AND TOUBRO LIMITED

The elegance of a theory lies in its practical application. The theory of measuring cost of capital is not simple. How can we estimate cost of capital in practice? We will use the data of L&T to calculate its cost of capital in the year 2002. L&T was founded in the year 1938. It is a large engineering company with diversified activities. L&T's main activities include dairy equipment, cement and cement equipment, steel, paper, nuclear power and space exploration, hydraulic excavators, switch gears, electronics controls, valves, welding alloys, computer peripherals, test and measuring equipment. It had total

Check Your Progress

13. State the limited application in practice behind the dividend-growth approach.
14. List the steps involved in calculating the firm's WACC.
15. What are flotation costs?

sales of ₹ 83,590 million, total gross assets of ₹ 156,540 million and net profit of ₹ 3,470 million in 2002. The capital structure of the company is given in Table 4.3.

Table 4.3 L&T's Capital Structure, 2001-02

Source of Capital	BV (₹ million)	BV Weights	MV (₹ million)	MV Weights
Short term debt	9,033.8	0.13	9,033.8	0.11
Long term debt	26,420.3	0.39	26,420.3	0.33
Debt	35,454.1	0.52	35,454.1	0.44
Equity	33,074.5	0.48	44,943.5	0.56
Total capital	68,528.6	1.00	80,397.6	1.00

Source: CMIE database.

Note: Equity excludes revaluation reserves

The market capitalization (the market value of equity) of L&T in March 2002 is ₹ 44,943.5 million. The market value of debt is assumed to be equal to the book value.

Table 4.4 provides data on L&T's EPS, DPS, payout, market value, dividend yield, earnings yield, and ROE for the years 1993 to 2002.

Table 4.4 L&T's Financial Data, 1993–2002

Year	EPS (₹million)	DPS (₹million)	BV (₹million)	MV (₹million)	ROE (%)	EY (%)	DY (%)	Payout (%)
Mar 93	15.64	3.50	64.46	287.50	18.75	2.30	1.43	62.06
Mar 94	19.17	4.00	69.12	240.00	13.27	3.19	1.39	43.62
Mar 95	12.09	5.00	89.74	268.75	13.47	5.04	2.08	41.36
Mar 96	13.44	6.00	110.62	262.00	12.15	5.00	2.23	44.64
Mar 97	16.55	6.00	122.80	253.00	13.48	6.32	2.29	36.25
Mar 98	21.39	6.50	135.88	230.00	15.74	8.45	2.57	30.39
Mar 99	18.94	6.50	147.41	211.25	12.85	8.23	2.83	34.32
Mar 00	13.74	6.50	153.83	397.73	8.93	6.50	3.08	47.31
Mar 01	8.85	6.50	155.10	232.08	5.71	2.23	1.63	73.45
Mar 02	16.51	7.00	163.56	201.28	10.06	7.11	3.02	42.40
Average	13.63	5.75	121.25	258.36	11.44	5.44	2.25	45.58

Source: CMIE database.

Estimation of L&T's Cost of Equity

There are two approaches for calculating the cost of equity:

- Constant dividend–growth model
- Capital asset pricing model (CAPM)

Dividend–Growth Model: The formula for calculating the cost of equity is as follows:

$$k_e = \frac{DIV_1}{P_0} + g$$

where the first term, DIV_1/P_0 , is the expected dividend yield and the second term, g , is the expected (constant) growth in dividends. L&T's dividend yield in 2002 is 3.02 per cent. The dividend yield of the company has varied from 1.39 per cent to 3.08 per cent

NOTES

with an average yield of 2.25 per cent. We assume that the current dividend yield of 3.02 per cent is a fair approximation of L&T's *expected* yield.

Estimation of growth rate: In practice, three methods may be used to estimate the growth rate:

NOTES

- (1) **Internal growth:** Internal growth is the product of retention ratio and return on equity (ROE):

$$g = \text{Retention ratio} \times \text{ROE}$$

This approach may be used when the firm has a stable dividend policy. L&T's payout ratio has fluctuated over years. However, on an average, it has distributed about 45 per cent of its net profit and retained 55 per cent in the past decade. In the most recent year (2002), it retained about 58 per cent of its profit. The company's ROE in 2002 is 10.06 per cent and 10-year average is 11.44 per cent. Assuming that the current retention ratio of 58 per cent and ROE of 10.06 per cent will continue in the future, then L&T's dividend is expected to grow at 6.1 per cent per year:

$$\begin{aligned} g &= \text{Retention ratio} \times \text{ROE} \\ &= 0.58 \times 0.106 = 0.061 \quad \text{or} \quad 6.1\% \end{aligned}$$

The constant growth model has its limitations. It is not applicable to those companies, which have highly unstable dividend policy (or retention ratio) and fluctuating ROE. One way to overcome this limitation is to estimate k_e for a large sample of companies of *equivalent risk* in the same industry and use the average k_e as an approximation of the cost of equity of the company under consideration. It is difficult to find similar companies like L&T. It is a diversified company but with a major presence in the engineering industry. One could calculate cost of equity of the industries where L&T has its operations and then, estimate the weighted average cost of equity using the proportion of L&T's investment in each business. In practice, this estimate of L&T's cost of equity may be relatively more reliable than the one based exclusively on its own data.

- (2) **Past average growth:** In practice, growth may be based on past EPS rather than DPS since companies do not change their DPS frequently with changes in EPS. Thus, DPS grows at a slower rate. The average of EPS past growth rates may be used as a proxy for the future growth. There are two alternatives available for calculating the average (1) the arithmetic average and (2) the geometric average. These two methods will give different estimates of the average growth rate. The geometric average will give a compounded average and is preferable when there is much variability in EPS data. Table 4.5 shows the calculation of the arithmetic average and the geometric average. The EPS growth in 1993 is calculated as: $g_1 = (\text{EPS}_{93} - \text{EPS}_{92}) / \text{EPS}_{92}$. Growth for other years is calculated similarly. The arithmetic average growth (for 10-year period from 1993 to 2002) is found as follows:

$$\text{Arithmetic average} = \frac{g_1 + g_2 + \dots + g_n}{n}$$

The geometric mean is calculated as follows:

$$\text{Geometric mean} = (1 + g_1) \times (1 + g_2) \times \dots \times (1 + g_n)^{1/n} - 1$$

Table 4.5 EPS Growth of L&T, 1993–2002

Year	EPS	g_{EPS}	$(1 + g_{EPS})$
Mar-92	7.82	—	
Mar-93	5.64	– 0.279	0.721
Mar-94	9.17	0.626	1.626
Mar-95	12.09	0.318	1.318
Mar-96	13.44	0.112	1.112
Mar-97	16.55	0.231	1.231
Mar-98	21.39	0.292	1.292
Mar-99	18.94	– 0.115	0.885
Mar-00	13.74	– 0.275	0.725
Mar-01	8.85	– 0.356	0.644
Mar-02	16.51	0.866	1.866
Average			
Arithmetic		0.142	
Geometric			0.078

NOTES

An alternative method for calculating the compounded growth rate is as follows:

$$\begin{aligned}
 EPS_n &= EPS_0(1 + g)^n \\
 (1 + g)^n &= \frac{EPS_n}{EPS_0} \\
 g &= \left[\frac{EPS_n}{EPS_0} \right]^{1/n} - 1 \\
 g &= \left[\frac{16.51}{7.82} \right]^{1/10} - 1 = 1.078 - 1 \\
 &= 0.078 \quad \text{or} \quad 7.8\%
 \end{aligned} \tag{22}$$

(3) Regression approach for estimating growth or log-linear approach: Both the arithmetic average and the geometric average methods of calculating growth have limitations. Simple average gives equal weight to each year's earnings. Both techniques are quite inadequate to use when earnings are widely fluctuating. The regression technique estimates growth over time (t) incorporating all observations.

The linear regression model is as follows:

$$EPS_t = a + bt \tag{23}$$

The linear model indicates growth in terms of rupees, rather than in percentage terms.

We know that the following formula explains the compound growth in EPS (or any other variable):

$$EPS_t = EPS_0(1 + g)^t \tag{24}$$

If we take the natural logarithm of EPS_t and EPS_0 , Equation (24) can be written as follows:

$$\ln EPS_t = \ln EPS_0 + t \ln (1 + g) \tag{25}$$

where $\ln \text{EPS}_t$ is natural logarithm of EPS_t . The regression model can be written as follows:

$$\ln \text{EPS}_t = a + bt \quad (26)$$

where $a = \ln \text{EPS}_0$ and $b = \ln(1 + g)$. The slope of the regression line is $b = \ln(1 + g)$ and it is estimated as follows:

$$\ln(1+g) = \frac{\sum_{t=1}^n (t - \bar{t}) \ln \text{EPS}_t}{\sum_{t=1}^n y_t^2} \quad (27)$$

where y_t is $t - \bar{t}$

Using the data in Table 4.6, we obtain

$$\ln(1+g) = \frac{5.6717}{82.50} = 0.0687$$

Taking antilog on both sides, we get:

$$1 + g = 1.0712$$

$$g = 1.0712 - 1 = 0.0712 \quad \text{or} \quad 7.12\%$$

Table 4.6 Log-linear Regression Growth Estimate for L&T

Year	t	$y = t - \bar{t}$	EPS	$\ln(\text{EPS})$	$y \ln(\text{EPS})$	y^2
1993	1	-4.50	5.64	1.7299	-7.7845	20.25
1994	2	-3.50	9.17	2.2159	-7.7558	12.25
1995	3	-2.50	12.09	2.4924	-6.2309	6.25
1996	4	-1.50	13.44	2.5982	-3.8974	2.25
1997	5	-0.50	16.55	2.8064	-1.4032	0.25
1998	6	0.50	21.39	3.0629	1.5315	0.25
1999	7	1.50	18.94	2.9413	4.4119	2.25
2000	8	2.50	13.74	2.6203	6.5508	6.25
2001	9	3.50	8.85	2.1804	7.6315	12.25
2002	10	4.50	16.51	<u>2.8040</u>	<u>12.6178</u>	<u>20.25</u>
Sum				25.4517	5.6717	82.50

The growth rates estimated according to the different methods are summarized in Table 4.7. The growth rate estimated by log-linear model is the most appropriate since L&T's EPS are highly variable. Thus, for the calculation of the L&T's cost of equity, we shall assume that the future dividend rate will be the same as the current dividend yield (3.02%) is and that the future growth will be 7.1 per cent. According to the dividend-growth model, L&T's cost of equity will be as follows:

$$k_e = \frac{\text{DIV}_1}{P_0} + g$$

$$k_e = 3.02\% + 7.12\% = 10.14\%$$

NOTES

Table 4.7 Estimate of Growth Rates and Cost of Equity

Method	Growth Rate (%)	Cost of Equity (%)
Internal growth	6.10	9.12
Arithmetic average	14.20	17.22
Geometric average	7.80	10.82
Log-linear growth	7.12	10.14

For different growth rates, L&T's cost of equity is calculated in Table 4.7. It varies from 9.12 per cent to 17.22 per cent. The geometric average and the log-linear growth methods give almost the same estimates for the growth rate and the cost of capital, i.e., about 10–11 per cent, for L&T.

Capital Asset Pricing Model and L&T's Cost of Equity

A more objective alternative model for calculating L&T's cost of equity is the capital asset pricing model (CAPM). The use of CAPM requires the following information:

- Expected risk-free rate of return
- Expected risk premium
- Beta of L&T's returns

Risk-free rate: The risk-free rate is generally approximated by the highly liquid government security. The yield on 91-day T-bills in India in March 2002 was about 6 per cent. This rate could be used as a proxy for the risk-free rate.

Market premium: The market premium is the excess of the expected market return over the expected risk-free rate of return. We can use the historical average over a very long period as a proxy for the market premium. There are no estimates of the market premium available in India. We will use 9 per cent as the market premium in our calculations.

L&T's beta: We use 5-year monthly data from April 1997 to March 2002 for calculating L&T's beta. We can calculate L&T's beta through the following regression equation:

$$R_{L\&T} = \alpha + \beta R_{Market} + \varepsilon$$

We use the regression analysis under the Tools wizard of the Excel to calculate L&T beta. Table 4.8 provides the beta coefficient and other regression statistics.

Table 4.8 Beta for L&T

Regression Statistics		
	Alpha	Beta
Coefficient	– 0.0014	1.5439
t-value	– 0.2543	9.4639
P-value	0.8002	0.0000
Multiple R		0.7791
R Square		0.6070
Adjusted R Square		0.6002
Standard Error		0.0429
F-value		89.5650
P-value		0.0000
Observations		60

NOTES

NOTES

L&T's beta is 1.54. This implies that L&T has above average risk of the market. The correlation coefficient of 0.78 between the market returns and L&T's returns indicates high positive relationship. Given the risk-free rate of return of 6 per cent, risk premium of 9 per cent and beta of 1.54, the cost of equity of L&T is 20 per cent:

$$\begin{aligned}\text{L\&T's cost of equity} &= \text{Risk-free rate} + (\text{Market rate} \\ &\quad - \text{Risk-free rate}) \times \text{L\&T's beta} \\ &= 0.06 + (0.09 \times 1.54) \\ &= .1986 \approx 0.20 \text{ or } 20\%\end{aligned}$$

The CAPM-based cost of equity for L&T (20%) is much higher than the estimates, according to the dividend-growth model. CAPM is theoretically superior to the dividend-growth model. We shall use 20 per cent as L&T's cost of equity.

L&T's Cost of Debt

L&T has both short-term (mostly bank borrowing) and long-term debt in its capital structure. It also has current liabilities such as creditors. What is the cost of current liabilities? Should it be included in the computation of the weighted cost of capital? There is no unanimity on this issue. The majority view is that current liabilities do not involve any explicit cost, and therefore, should be excluded from the cost of capital calculation. An alternative view is that they involve implicit cost since creditors build it in the price of their products. How can we compute the implicit cost of current liabilities? Since they involve the same risk as bank borrowings, the before-tax cost of current liabilities can be treated as equal to the cost of bank borrowing. We have ignored current liabilities in the calculation of L&T's cost of capital.

In the year 2002, L&T has a debt ratio of 52 per cent, comprising 13 per cent short-term debt and 39 per cent long-term debt. This implies that of total debt, short-term debt is 25 per cent (13%/52%) and long-term debt 75 per cent (39%/52%). Over the last five years (from 1998 to 2002), there has been some increase in short-term debt and long-term debt and a decline in L&T's equity. The cost of the short-term debt was about 16 per cent and long-term debt about 14 per cent in 2002. We may assume that L&T will incur these costs in obtaining debt in the future as well. Further, we assume that L&T's short-term debt will continue to be 25 per cent of total debt and long-term debt 75 per cent, and that corporate tax rate will be approximately 35 per cent. The after-tax weighted cost of L&T's debt will be:

$$\begin{aligned}\text{After-tax weighted cost of debt:} \\ &= 0.16(1 - 0.35) \times 0.25 + 0.14(1 - 0.35) \times 0.75 \\ &= 0.026 + 0.068 \\ &= 0.094 \text{ or approx. } 9.4\%\end{aligned}$$

L&T's Weighted Average Cost of Capital

We have estimated L&T's cost of equity and cost of debt. If we know L&T's *target capital structure*, we can estimate L&T's weighted average cost of capital. Theoretically, the target capital structure should be stated in terms of market value. However, target capital structure in practice may be expressed in terms of book value. Let us assume that L&T will maintain its current capital structure in the future. Its weighted average cost of capital will be as follows:

Source of Capital	Cost of Capital	Weights		WACC	
		Book Value	Market Value	Book Value	Market Value
Equity	0.200	0.48	0.56	0.096	0.112
Debt	0.094	0.52	0.44	0.049	0.041
Total				0.145	0.153

NOTES

L&T's weighted average cost of capital is approximately 14.5 per cent at book value weights and 15.3 per cent at market value weights. Its market value weighted average cost of capital is slightly higher than the book value weighted average cost of capital since the market value of equity is more than the book value. *If L&T is considering an investment project of 'average risk' (that is, similar to L&T's risk) that has the same capital structure as the firm, then it can use 15 per cent as discount rate to compute the project's NPV.* L&T cannot use its WACC for evaluating those projects that have higher or lower risk than the firm.

L&T's Cost of Capital Revisited: Data from 2003–04 to 2006–07

During the year 2003–04, L&T's capital and assets were restructured due to business reorganization. The paid up equity capital reduced to one-tenth in the year 2003–04. The company also issued bonus share in the ratio of 1:1 in 2006. Table 4.9 provides earnings and dividend data for L&T during the four year period from 2003–04 to 2006–07.

Table 4.9 L&T Earnings Data: 2004 to 2007

Year	EPS (₹)	DPS (%)	Payout (%)	RE (%)	NW (₹) (Cr.)	ROE (%)	MP (₹)
2004	42.8	18.1	42.2	57.8	2696.2	19.8	574.4
2005	77.6	32.1	41.3	58.7	3298.3	29.8	497.6
2006	76.1	26.2	34.5	65.5	4588.8	22.0	1216.3
2007	100.4	30.6	30.5	69.5	5730.7	24.5	1619.2
Average	74.2	26.7	37.1	62.9	4078.5	24.0	976.8

The 4-year average ROE is 24 per cent and average retention ratio is about 63 per cent. Both ROE and retention ratio are showing increasing trend. We could reasonably assume that L&T's ROE will be about 25 per cent and retention ratio about 70 per cent. Thus, expected growth rate will be:

$$g = \text{ROE} \times \text{Retention ratio} = 25\% \times 0.70 = 17.5\%$$

The dividend yield in 2007 is: $\text{DPS}/\text{MP} = 30.6/1619.2 = 2.0\%$ (approx.). Thus, L&T's cost of equity, using internal growth model, is:

$$\begin{aligned} \text{L\&T's cost of equity} \\ &= \text{dividend yield} + \text{expected growth} \\ &= 2\% + 17.5\% = 19.5\% \end{aligned}$$

L&T's growth expectations have increased significantly in the last four years. Consequently, its ROE has also increased.

NOTES

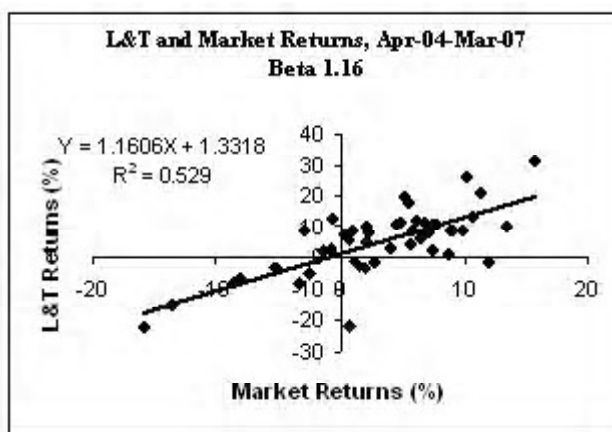


Fig. 4.3 L&T's Beta based on Monthly Returns Data from Apr-04 to Mar-07

Alternatively, we can use CAPM to calculate L&T's ROE. We have discussed in Chapter 6 that keeping in mind the current conditions, risk-free rate in India may be approximated at about 8 per cent and risk premium at 12 per cent. Further, using monthly return data from April 2004 to March 2007, L&T's beta is estimated as 1.16 (see Figure 4.3). L&T's beta has reduced from 1.54 to 1.16. The company's cost of equity as per CAPM is follows:

$$\begin{aligned} \text{L\&T's cost of equity} &= \text{risk-free rate} + \text{risk premium} \times \text{L\&T's beta} \\ &= 8\% + 12\% \times 1.16 = 21.9\% \end{aligned}$$

Notice that the CAPM-based cost of equity is much higher than the cost of equity based on the constant-growth model. The CAPM-based cost of equity is more objective and reliable estimate.

In the last four years, L&T's capital structure has undergone changes as the company is financially more conservative. It employs almost about 75 per cent equity and 25 per cent debt, mostly long-term debt (see Table 4.10). A triple-A company like L&T is able to raise debt at about 15 per cent interest rate. Assuming 35 per cent corporate tax rate, the after-tax cost of debt is: $(1 - 0.35) \times 15\% = 9.75$ per cent.

Table 4.10 L&T's Debt and Equity Ratios

Year	LTD ratio (%)	STD ratio (%)	Debt ratio (%)	Equity ratio (%)
2004	24.2	8.6	32.9	67.1
2005	28.1	7.8	35.9	64.1
2006	20.0	4.2	24.2	75.8
2007	20.0	6.5	26.5	73.5

L&T's weighted average cost of capital is calculated as follows:

$$\begin{aligned} \text{L\&T's WACC} &= 21.9\% \times 0.75 + 9.75\% \times 0.25 \\ &= 18.9\% \quad \text{or} \quad 19\%. \end{aligned}$$

This estimate of L&T's WACC is about 3.5 per cent higher than the estimate based on data until 2002. There are two reasons for this: (a) higher risk premium and (b) lower debt ratio.

4.12 DIVISIONAL AND PROJECT COST OF CAPITAL

We emphasize again that the required rate of return, or the cost of capital is a market determined rate and it reflects compensation to investors for the time value of money and risk of the investment project. It is, thus, composed of a risk-free rate (compensation for time) *plus* a risk-premium rate (compensation for risk). Investors are generally risk-averse, and demand a premium for bearing risk. The greater the risk of an investment opportunity, the greater the risk-premium required by investors. Therefore, the required rate of return of a division or a project depends on its risk. Since investors are risk-averse, divisions and projects with differing risks should be evaluated using their risk-adjusted required rates of return.

The firm's risk is composed of its overall operating risk and financial risk. **Operating risk** arises due to the uncertainty of cash flows of the firm's investments. **Financial risk** arises on account of the use of debt for financing investments. The firm's risk is also a composite risk of assets financed by the firm. Thus, the firm's cost of capital reflects the rate of return required on its securities commensurate with the perceived 'average' risk. The firm's cost of capital, therefore, cannot be used for evaluating individual divisions or investment projects that have different degrees of risk. The firm's cost of capital as a required rate of return for all projects may work well in case of companies that have a single line of business or where different businesses are highly correlated. In highly diversified, multiple-business firms like L&T, or Grasim Industries Limited, all projects cannot have same risk. Even Hindustan Unilever Limited (HUL), which basically operates in fast moving consumer products markets, has distinct markets for its consumer products. In each market segment, HUL is exposed to different degrees of competition and other environmental forces, which results in different risks for all its market segments. Hence, it is essential to estimate the required rate of return for each market segment or division than using the firm's cost of capital as a single, corporate-wide required rate of return for evaluating projects of divisions. Further, projects within a single division may differ in risk. For example, the risk of introducing a new, innovative product will be higher than the expansion of an existing product. Hence, there is need for calculating the required rate of return for projects within a division.

The capital asset pricing model is helpful in determining the required rate of return (or the cost of capital) for a division or a project. The risk-free rate and the market premium for divisions or projects are same as for the firm. What we need is the divisional or project betas. In practice, it is difficult to estimate divisional or project betas. What approach could we follow to estimate the required rate of return of a division or a project?

The Pure-play Technique

Suppose that Surya Enterprises Limited has three divisions: Pharmaceuticals Division, Financial Services Division and Power Generation Division. The company's cost of capital is 12 per cent. Since the company has three diverse businesses with different operating characteristics, it cannot use its overall cost of capital as the required rate of return for its divisions. It should estimate the required rate of return for each division separately. Suppose Surya is considering an investment in the Pharmaceuticals Division, and therefore, it would like to estimate the required rate of return for the division. A most commonly suggested method for calculating the required rate of return for a division (or project) is the **pure-play technique**. The basic idea is to use the beta of the comparable

NOTES

NOTES

firms, called **pure-play firms**, in the same industry or line of business as a proxy for the beta of the division or the project. The application of the pure-play approach for calculating the Pharmaceuticals Division's cost of capital will involve the following steps:

Identify comparable firms: The critical step is the identification of comparable or pure-play firms. These firms should have business identical to the division or the project. It is rare to find perfectly comparable or pure-play firms in practice, as any two firms in the same line of business cannot have exactly similar features; they would have some differences. However, it is not impossible to identify approximately equivalent matches in terms of product line and product mixes. One or two good matches would suffice as proxy for the division or the project. If good matches cannot be found, the average data of a broader sample of firms should be used to even out the differences.

Surya has identified the following three pure-play firms:

Firm	(₹ million)			
	Sales	Assets	Debt	Market value equity
Excel Pharma	1,000	650	325	645
Sunshine Pharma	800	700	180	700
Kiran Pharma	1,400	1,250	625	750

Estimate equity betas for comparable firms: Once the comparable or the pure-play firms have been identified, their betas should be calculated using CAPM framework and a market index such as Sensex. Alternatively, we can use betas computed by organizations like the Bombay Stock Exchange or the National Stock Exchange or any other agency. These betas are based on the share price and the market index data. Hence they are the **equity betas** for the pure-play firms. An equity beta (b_e) is also called levered beta (b_l).

The equity betas for Excel, Sunshine and Kiran, estimated using the CAPM approach, are 1.24, 0.94 and 1.05.

Estimate asset betas for comparable firms: The comparable firms also employ debt to finance their assets. The equity betas of these firms are affected by their debt ratios. The firm may have a different target capital structure than the debt ratios of the proxy firms. Therefore, the pure-play technique requires that the levered equity betas of the proxy firms should be changed to unlevered or all-equity beta. Unlevered or all-equity betas are also called asset betas. Unlevered (or asset) beta is the weighted average of beta for debt and equity (or levered) beta:

$$\beta_a = \beta_d \left(\frac{D}{V} \right) + \beta_e \left(\frac{E}{V} \right)$$

$$\beta_u = \beta_d \left(\frac{D}{V} \right) + \beta_l \left(\frac{E}{V} \right)$$

If we consider that debt is risk free, then b_d is zero, and we can find unlevered beta as follows:

$$\beta_u = \beta_l \left(\frac{E}{V} \right) = \beta_l \left(1 - \frac{D}{V} \right) \quad (28)$$

where b_u is the beta of the pure-play firm after removing the effect of leverage; b_l is its equity beta with leverage; and E/V is the ratio of the pure-play firm's equity to its total market value. Note that Equation (28) is based on two important assumptions. First, that debt is risk free and hence the beta for debt is zero. Second, all pure-play firms

maintain target capital structures and therefore, the amounts of debt change with the change in the values of firms.¹⁵ The unlevered or all-equity beta is also called the asset beta as it incorporates only the firm's operating risk and is not influenced by the financial risk arising from the use of debt.

The unlevered or asset betas for Excel, Sunshine and Kiran are as follows:

Asset Beta for Excel

$$\beta_a = 1.24 \times \frac{645}{325 + 645} = 1.24 \times 0.665 = 0.82$$

Asset Beta for Sunshine

$$\beta_a = 0.94 \times \frac{700}{180 + 700} = 0.94 \times 0.795 = 0.75$$

Asset Beta for Kiran

$$\beta_a = 1.05 \times \frac{750}{625 + 750} = 1.05 \times 0.545 = 0.55$$

Calculate the division's beta: We can use the average asset beta of the pure-play firms as a proxy for the asset beta of the Pharmaceutical Division of Surya Enterprises Limited. We can use either simple or the weighted average. We can use either sales or assets or the value of the firms as weights. The theory does not tell us whether we should use simple or weighted average and what should be the weights. In practice, financial analysts will have to use their judgment. We think that since there is no theory and since we do not know the nature of measurement error, a simple average will do a good job. For illustration, we calculate the weighted beta using assets as weights:

Weighted asset beta

$$= 0.82 \times \frac{650}{2,600} + 0.75 \times \frac{700}{2,600} + 0.55 \times \frac{1,250}{2,600} = 0.67$$

Calculate the division's all-equity cost of capital: Suppose that the risk-free rate is 6 per cent and market risk premium is 9 per cent. The Pharmaceutical Division's all-equity cost of capital is:

$$k_a = r_f + \text{risk - premium} \times \beta_a$$

$$k_a = 0.06 + 0.09 \times 0.67 = 0.12 \quad \text{or} \quad 12\%$$

The all-equity cost of capital is without financial risk. As it reflects only the business risk, it is also referred to as the asset or unlevered cost of capital.

Calculate the division's equity cost of capital: The asset (or unlevered) beta for the Pharmaceutical Division is 0.67. We need to convert the asset (unlevered) beta into the equity (levered) beta for calculating the cost of equity for the Pharmaceutical Division. To obtain the equity beta, the asset beta should be relevered to reflect the target capital structure of the Pharmaceutical Division. What is the target capital structure of the Pharmaceutical Division? Surya Enterprises Limited may use the firm's target capital structure for the Pharmaceutical Division as well. Alternatively, it may decide the Pharmaceutical Division's target capital structure based on the average debt ratio of the pure-play firms. The average debt ratio (D/V) of the pure-play firms is 0.33. Using this ratio, the equity beta for the Pharmaceutical Division is 1.00:

NOTES

NOTES

$$\begin{aligned}
 \beta_l &= \beta_u \left(\frac{E}{V} \right) = \beta_u \left(1 - \frac{D}{V} \right) \\
 \beta_u &= \beta_l \left(\frac{1}{1 - \frac{D}{V}} \right) \\
 &= 0.67 \left(\frac{1}{1 - 0.33} \right) = 0.67 \times 1.49 = 1.00
 \end{aligned} \tag{29}$$

Now we can calculate the cost of equity for the Pharmaceutical Division as follows:

$$k_e = 0.06 + 0.09 \times 1.00 = 0.15 \text{ or } 15\%$$

Calculate the division's cost of capital: The cost of capital for the division is the weighted average of the cost of equity and the cost of debt. We have estimated the target debt ratio for the Pharmaceutical Division as 0.33. Suppose the cost of debt (before tax) for the Pharmaceutical Division is 10 per cent and tax rate is 35 per cent, its weighted cost of capital can be calculated as follows:

$$\begin{aligned}
 k_0 &= k_d(1 - T) \left(\frac{D}{V} \right) + k_e \left(\frac{E}{V} \right) \\
 &= 0.10(1 - 0.35)(0.33) + 0.15(0.67) = 0.12 \text{ or } 12\%
 \end{aligned} \tag{30}$$

It should be clear from the approach discussed here that each division has its own operating risk and debt capacity. Therefore, for calculating the cost of capital for each division, you should determine its operating risk and debt capacity. Assets of the firm are the aggregate of assets of the divisions. Therefore, the beta of assets for the firm should be the weighted average of betas for the divisions:

$$\begin{aligned}
 \text{Firm's asset beta} &= \text{beta of division 1} \\
 &\quad \times \text{weight of division 1} \\
 &\quad + \text{beta of division 2} \\
 &\quad \times \text{weight of division 2} + \dots \\
 &\quad + \text{beta of division } n \times \\
 &\quad \text{weight of division } n
 \end{aligned}$$

It seems plausible that weights may be expressed in terms of market value of assets. In practice, the market value of assets of divisions are not available, therefore, weights may be expressed in terms of book value assets or sales.

The calculated average asset beta for the firm may be more than its observed asset beta. This may happen because of the synergy effect. A vertically integrated firm is likely to be more efficient than if the divisions operate as independent, separate firms. The vertically integrated firms are able to reduce operating cost. This premium resulting from diversification should be allocated to the divisions. Management will have to use its judgment in doing so as there is no formula available. Yet another problem that may arise in moving from a single cut-off rate to multiple cut-off rates, relates to the behaviour of managers. Some managers may resist the change. For some divisions (with higher risks), the divisional cut-off rates will be higher than the corporate-wide cut-off rate. These divisions are likely to get fewer funds allocated to them. They may therefore oppose the

system of the multiple cut-off rates. Management must take all into confidence and convince them that the use of a single, corporate-wide cut-off rate use is biased in favour of the investment projects of high-risk divisions since their expected returns will be higher. In the long-term, this approach will make the firm highly risky. Ideally, the firm would like to balance risk by having a portfolio of high risk and low risk projects.

Illustration 4.9: Calculation of Beta and Cost of Capital for a Division

Sinhgarh Engineering Company wants to diversify into fertilizer business and organise it as a new division. The company found a comparable fertilizer company of roughly the same characteristics as the proposed division. It has equity beta of 1.35, and debt ratio of 0.72. The corporate tax rate is 35 per cent. Sinhgarh will have a debt ratio of 0.50 for the proposed fertilizer business. The risk-free rate is 8 per cent and the risk premium is 10 per cent. Calculate the cost of equity for the proposed new division.

First, we shall ‘unlever’ the levered equity beta (that is, calculate the asset beta) of the comparable (pure-play) firm:

$$\beta_a = \beta_e \left(1 - \frac{D}{V} \right) = 1.35(1 - 0.72) = 0.38$$

We can use the asset beta of the comparable firm as a proxy for the asset beta of the fertilizer division.

Second, we can now ‘lever’ the asset beta to obtain the equity beta for the division by incorporating its debt ratio:

$$\beta_e = \beta_a \left(\frac{1}{1 - \frac{D}{V}} \right) = 0.38 \left(\frac{1}{1 - 0.50} \right) = 0.38 \times 2.00 = 0.76$$

The equity beta for the division is lower than that of the comparable firm since it will employ less debt.

Third, we can calculate the division’s cost of equity as follows:

$$k_e = 0.08 + 0.10 \times 0.76 = 0.156 \text{ or } 15.6\%$$

The Cost of Capital for Projects

The procedure described for calculating the cost of capital for divisions can be followed in the case of large projects. Many times it may be quite difficult to identify comparable (pure-play) firms. The risk of a project depends on its operating leverage. So you can estimate a project’s beta based on its operating leverage. You may also consider the variability of the project’s earnings to estimate the beta.

A simple practical approach to incorporate risk differences in projects is to adjust the firm’s or division’s WACC (upwards or downwards), and use the *adjusted WACC* to evaluate the investment project:

$$\text{Adjusted WACC} = \text{WACC} \pm R \quad (31)$$

That is, a project’s cost of capital is equal to the firm’s or division’s weighted average cost of capital plus or minus a risk adjustment factor, *R*. The risk adjustment factor would be determined on the basis of the decision maker’s past experience and judgment regarding the project’s risk. It should be noted that adjusting of division’s WACC

NOTES

for risk differences is not theoretically a very sound method; however, this approach is better than simply using the firm's or division WACC for all projects without regard for their risk.

NOTES

Companies in practice may develop policy guidelines for incorporating the project risk differences. One approach is to divide projects into broad risk classes, and use different discount rates based on the decision maker's experience. For example, projects may be classified as:

- Low risk projects
- Medium risk projects
- High risk projects

Low risk projects include replacement and modernization projects. The decision maker can estimate the benefits (increase in revenue and/or reduction in costs) of replacement/modernization projects with relative accuracy. Medium risk projects include investment for expansion of the current business. Although revenue and cost estimates are relatively difficult to make, yet the decision maker is familiar with the nature of businesses. Therefore, using his experience and judgment, he can have a reasonable idea of the variability of cash flows. High-risk projects include diversification into new businesses. As the decision maker has no or little idea of new business, he or she would find greater difficulty in estimating cash flows. Cash flows could show high variability. Within each category, projects could be further sub-divided. Figure 4.3 illustrates the *risk-adjusted discount rates* for projects classified according to their perceived risk.

Figure 4.4 indicates that projects' risk differ, and higher the project risk, the higher will be the risk-adjusted discount rate. Replacement projects are discounted at a lower rate than expansion or diversification projects since its risk is the lowest. Diversification projects involve high risk; therefore, their cash flows are discounted at a high discount rate. It may be noted that WACC reflects, 'average risk', therefore it is drawn as a horizontal line. It fails to distinguish between projects with different risk characteristics, and can mislead in undertaking profitable projects. For example, consider Projects A and B which respectively have internal rates of return, IRR_A and IRR_B . You can see from Figure 4.3 that if WACC criterion is used, Project A will be rejected (because $IRR_A < WACC$) and Project B will be accepted (because $IRR_B > WACC$). However, if risk-adjusted discount rates are used, then Project A should be accepted while Project B rejected. Note that discount rate must reflect risk of the project.

Check Your Progress

16. List the two approaches for calculating the cost of equity.
17. Define market premium.
18. Classify the different types of projects.

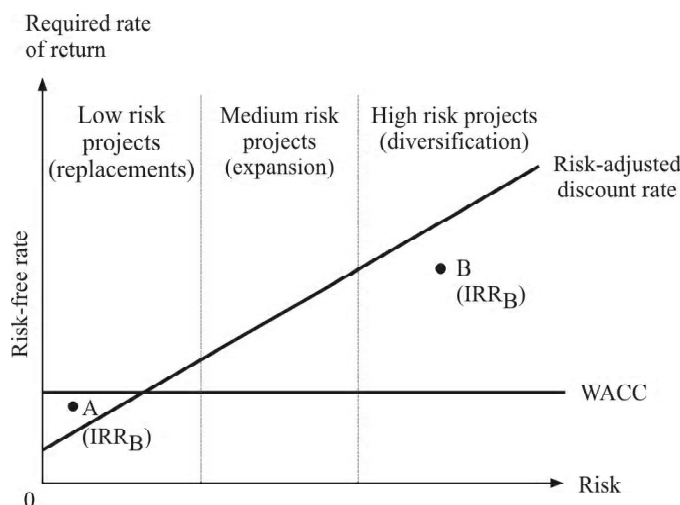


Fig. 4.4 L&T's Beta based on Monthly Returns Data from Apr-04 to Mar-07

4.13 SUMMARY

- The primary purpose of measuring the cost of capital is its use as a financial standard for evaluating the investment projects.
- The cost of capital is the minimum required rate of return on the investment project that keeps the present wealth of shareholders unchanged.
- The cost of capital can also be useful in deciding about the methods of financing at a point of time.
- The cost of capital also plays a useful role in dividend decision and investment in current assets.
- The opportunity cost is the rate of return foregone on the next best alternative investment opportunity of comparable risk.
- The cost of capital of each source of capital is known as component, or specific, cost of capital.
- Marginal cost is the new or the incremental cost that the firm incurs if it were to raise capital now, or in the near future.
- The before-tax cost of debt is the rate of return required by lenders. It is easy to compute before-tax cost of debt issued and to be redeemed at par; it is simply equal to the contractual (or coupon) rate of interest.
- The cost of preference capital is a function of the dividend expected by investors. Preference capital is never issued with an intention not to pay dividends.
- The dividend-growth approach has limited application in practice because of its two assumptions. First, it assumes that the dividend per share will grow at a constant rate, g , forever. Second, the expected dividend growth rate, g , should be less than the cost of equity, k_e , to arrive at the simple growth formula.
- WACC is the composite or overall cost of capital.
- Flotation costs are not annual costs; they are one-time costs incurred when the investment project is undertaken and financed.
- There are two approaches for calculating the cost of equity—constant dividend-growth model and the capital asset pricing model (CAPM).
- The firm's risk is composed of its overall operating risk and financial risk. Operating risk arises due to the uncertainty of cash flows of the firm's investments. Financial risk arises on account of the use of debt for financing investments.

NOTES

4.14 KEY TERMS

- **Cost of capital:** The cost of capital is the minimum required rate of return on the investment project that keeps the present wealth of shareholders unchanged.
- **Opportunity cost:** The opportunity cost is the rate of return foregone on the next best alternative investment opportunity of comparable risk.
- **Marginal cost:** Marginal cost is the new or the incremental cost that the firm incurs if it were to raise capital now, or in the near future.
- **Cost of preference capital:** The cost of preference capital is a function of the dividend expected by investors.

NOTES

- **Flotation costs:** Flotation costs are not annual costs; they are one-time costs incurred when the investment project is undertaken and financed.
- **Weighted average cost of capital (WACC):** The component costs are combined according to the weight of each component capital to obtain the average costs of capital. Thus, the overall cost is also called the weighted average cost of capital (WACC).

4.15 ANSWERS TO ‘CHECK YOUR PROGRESS’

1. The cost of capital is the minimum required rate of return on the investment project that keeps the present wealth of shareholders unchanged.
2. The cost of capital can also be useful in deciding about the methods of financing at a point of time. The cost of capital also plays a useful role in dividend decision and investment in current assets.
3. The opportunity cost is the rate of return foregone on the next best alternative investment opportunity of comparable risk.
4. The combined cost of all sources of capital is called overall, or average cost of capital. The component costs are combined according to the weight of each component capital to obtain the average costs of capital. Thus, the overall cost is also called the weighted average cost of capital (WACC).
5. Marginal cost is the new or the incremental cost that the firm incurs if it were to raise capital now, or in the near future.
6. A company may raise debt in a variety of ways. It may borrow funds from financial institutions or public either in the form of public deposits or debentures (bonds) for a specified period of time at a certain rate of interest. A debenture or bond may be issued at par or at a discount or premium as compared to its face value.
7. The contractual rate of interest or the coupon rate forms the basis for calculating the cost of debt.
8. The cost of preference capital is a function of the dividend expected by investors.
9. Redeemable preference shares are shares with finite maturity.
10. The cost of preference share is not adjusted for taxes because preference dividend is paid after the corporate taxes have been paid.
11. It is sometimes argued that the equity capital is free of cost. The reason for such argument is that it is not legally binding for firms to pay dividends to ordinary shareholders. Further, unlike the interest rate or preference dividend rate, the equity dividend rate is not fixed.
12. As a general rule, it is not theoretically correct to use the ratio of earnings to price as a measure of the cost of equity. The earnings–price (E/P) ratio does not reflect the true expectations of the ordinary shareholders.
13. The dividend-growth approach has limited application in practice because of its two assumptions. First, it assumes that the dividend per share will grow at a constant rate, g , forever. Second, the expected dividend growth rate, g , should be less than the cost of equity, k_e , to arrive at the simple growth formula.

14. The following steps are involved for calculating the firm's WACC:
 - Calculate the cost of specific sources of funds
 - Multiply the cost of each source by its proportion in the capital structure
 - Add the weighted component costs to get the WACC
15. Flotation costs are not annual costs; they are one-time costs incurred when the investment project is undertaken and financed.
16. There are two approaches for calculating the cost of equity:
 - Constant dividend–growth model
 - Capital asset pricing model (CAPM)
17. The market premium is the excess of the expected market return over the expected risk-free rate of return.
18. Projects may be classified as:
 - Low risk projects
 - Medium risk projects
 - High risk projects

NOTES

4.16 QUESTIONS AND EXERCISES

Short-Answer Questions

1. Why and how the cost of debt is adjusted for taxes?
2. What are the consequences of not paying dividends on preference capital?
3. State the reasons behind the measurement of the cost of equity being a difficult task.
4. 'The use of the book-value weights can be seriously questioned on theoretical grounds.' Give reasons.
5. Distinguish between operating and financial risk.

Long-Answer Questions

1. Explain the dividend-growth model for calculating equity.
2. Discuss weighted average cost of capital. What are the limitations of book-value weights? Why is market-value weights considered to be superior?
3. Distinguish between cost of equity calculated by the dividend-growth model and the CAPM. Which method is better?
4. Explain the steps in pure-play technique of determining the divisional cost of capital.
5. How is the cost of capital of projects determined?

4.17 FURTHER READING

- Pandey, IM. 2009. *Financial Management*. India: Vikas Publishing Pvt Ltd.
- Kuchal, SC. 1999. *Financial Management: An Analytical and Conceptual Approach*. India: Chaitanya Publishing house.

Endnotes**NOTES**

1. Quirin, G. D., *The Capital Expenditure Decision*, Richard D. Irwin, 1967, p. 92.
2. Bhattacharya, S.K., A Cost-of-Capital Framework for Management Control, *Economic and Political Weekly*, Vol. 35, 29 August, 1970.
3. Porterfield J.T.S., *Investment Decisions and Capital Costs*, Prentice-Hall, 1965, p. 45.
4. Barges, A., *The Effect of Capital Structure and the Cost of Capital*, Prentice-Hall, 1963, p. 2.
5. It is argued later in the chapter that flotation costs should not be incorporated in the computation of the cost of capital, rather they should be adjusted in the investment project's cash flows.
6. Financial institutions generally require principal to be amortized periodically. The issue of bond or debenture by a company may also provide for periodical amortization. When principal is repaid each period instead of a lump sum at maturity, cash outflows each period will include interest and principal, and interest each period will be calculated on the outstanding principal. The following formula can be used to calculate the before-tax cost of debt in this situation:

$$B_0 = \sum_{t=1}^n \frac{INT_t + B_t}{(1 + k_d)^t}$$

where INT_t and B_t are respectively the periodical payment of interest and principal.

7. Quirin, *op. cit.*, 1967.
8. Currently (2010) the corporate tax rate in India is 30 per cent plus 3 per cent education cess. Hence, it is about 31 per cent.
9. In India, irredeemable preference shares cannot be issued.
10. In fact, companies in India now (2010) will have to pay tax at 15 per cent and surcharge of 3 per cent on the amount of dividend distributed. Thus, the effective cost of preference capital to a company would be more than that shown by Equation (6) or (7). The same argument will be applicable to the equity capital.
11. The cost of equity can also be determined by using the capital asset pricing model. This is discussed in a later section.
12. Gordon, M., *The Investment, Financing and Valuation of the Corporation*, Richard D. Irwin, 1962.
13. Solomon, E., *The Theory of Financial Management*, Columbia University Press, 1963, p. 64.
14. Keene, Simon E., The Investment Discount Rate—In Defence of the Market Rate of Interest, *Accounting and Business Research* (Summer 1976); and Ezzell, John R. and R. Pourr Porter, Flotation costs and the Weighted Average Cost of Capital, *Journal of Financial and Quantitative Analysis*, 11, (Sept. 1976). Also, refer Van Horne, *op. cit.*,
15. The implication is that the amount of debt, and hence the interest tax shield will fluctuate with the firm's operations. This means that the interest tax shield will be as risky as the operations. Thus, we do not make any adjustment for interest tax shield in unlevering (or levering beta). This point is explained in a subsequent chapter.

UNIT 5 CAPITAL BUDGETING

Structure

- 5.0 Introduction
- 5.1 Unit Objectives
- 5.2 Concepts and Steps
- 5.3 Average Rate of Return
- 5.4 Payback Period
- 5.5 Present Value Method
- 5.6 Internal Rate of Return
- 5.7 Summary
- 5.8 Key Terms
- 5.9 Answers to 'Check Your Progress'
- 5.10 Questions and Exercises
- 5.11 Further Reading
- Endnotes/References

NOTES

5.0 INTRODUCTION

An efficient allocation of capital is the most important finance function in the modern times. It involves decisions to commit the firm's funds to the long-term assets. Capital budgeting or investment decisions are of considerable importance to the firm since they tend to determine its value by influencing its growth, profitability and risk. In this unit we focus on the nature and evaluation of capital budgeting decisions.

5.1 UNIT OBJECTIVES

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

- Discuss the concepts and steps involved in capital budgeting
- Explain the concept of average rate of return
- Understand the concept of payback period
- Discuss the present value method
- Explain the concept of internal rate of return

5.2 CONCEPTS AND STEPS

Capital expenditure or investment planning and control involve a process of facilitating decisions covering expenditures on long-term assets. Since a company's survival and profitability hinges on capital expenditures, especially the major ones, the importance of the capital budgeting or investment process cannot be over-emphasised. A number of managers think that investment projects have strategic elements, and the investment analysis should be conducted within the overall framework of corporate strategy. Some managers feel that the qualitative aspects of investment projects should be given due importance.

NOTES

Capital Investments

Strictly speaking, **capital investments** should include all those expenditures, which are expected to produce benefits to the firm over a long period of time, and encompass both tangible and intangible assets. Thus, R&D (research and development) expenditure is a capital investment. Similarly, the expenditure incurred in acquiring a patent or brand is also a capital investment. In practice, a number of companies follow the traditional definition, covering only expenditures on tangible fixed assets as capital investments (expenditures). The Indian companies are also influenced considerably by accounting conventions and tax regulations in classifying capital expenditures. Large expenditures on R&D, advertisement, or employees training, which tend to create valuable intangible assets, may not be included in the definition of capital investments since most of them are allowed to be expensed for tax purposes in the year in which they are incurred. From the point of view of sound decision-making, these expenditures should be treated as capital investments and subjected to proper evaluation.

A number of companies follow the accounting convention to prepare asset wise classification of capital expenditures, which is hardly of much use in decision-making. Some companies classify capital expenditures in a manner, which could provide useful information for decision-making. Their classification is (i) replacement, (ii) modernisation, (iii) expansion, (iv) new project, (v) research and development, (vi) diversification, and (vii) cost reduction.

Capital Investment Planning And Control

At least five phases of capital expenditure planning and control can be identified:

- Identification (or origination) of investment opportunities
- Development of forecasts of benefits and costs
- Evaluation of the net benefits
- Authorisation for progressing and spending capital expenditure
- Control of capital projects

The available literature puts the maximum emphasis on the evaluation phase. Two reasons may be attributed to this bias. First, this phase is easily amenable to a structured, quantitative analysis. Second, it is considered to be the most important phase by academicians. Practitioners, on the other hand, consider other phases to be more important.¹ The capital investment planning and control phases are discussed below.

Investment Ideas: Who Generates?: Investment opportunities have to be identified or created; they do not occur automatically.^{2,3} Investment proposals of various types may originate at different levels within a firm. Most proposals, in the nature of cost reduction or replacement or process or product improvements take place at plant level. The contribution of top management in generating investment ideas is generally confined to expansion or diversification projects. The proposals may originate systematically or haphazardly in a firm. The proposal for adding a new product may emanate from the marketing department or from the plant manager who thinks of a better way of utilising idle capacity. Suggestions for replacing an old machine or improving the production techniques may arise at the factory level. In view of the fact that enough investment proposals should be generated to employ the firm's funds fully well and efficiently, a systematic procedure for generating proposals may be evolved by a firm.

In a number of Indian companies, the investment ideas are generated at the plant level. The contribution of the board in idea generation is relatively insignificant. However, some companies depend on the board for certain investment ideas, particularly those that are strategic in nature. Other companies depend on research centres for investment ideas.

Is the investment idea generation primarily a bottom-up process in India? In UK, both bottom-up, as well as top-down processes exist.⁴ The Indian practice is more like that in USA. Project initiation is a bottom-up process in USA, with about more than three-fourths of investment proposals coming from divisional management and plant personnel.⁵ However, we should note that the small number of ideas generated at the top may represent a high percentage in terms of investment value, so that what looks to be an entirely bottom-up process may not be really so.

Indian companies use a variety of methods to encourage idea generation. The most common methods used are—(a) management sponsored studies for project identification, (b) formal suggestion schemes, and (c) consulting advice. Most companies use a combination of methods. The offer of financial incentives for generating investment idea is not a popular practice. Other efforts employed by companies in searching investment ideas are—(a) review of researches done in the country or abroad, (b) conducting market surveys, and (c) deputing executives to international trade fairs for identifying new products/technology.

Once the investment proposals have been identified, they are be submitted for scrutiny. Many companies specify the time for submitting the proposals for scrutiny.

Developing Cash Flow Estimates: Estimation of cash flows is a difficult task because the future is uncertain. Operating managers with the help of finance executives should develop cash flow estimates. The risk associated with cash flows should also be properly handled and should be taken into account in the decision making process. Estimation of cash flows requires collection and analysis of all qualitative and quantitative data, both financial and non-financial in nature. Large companies would generally have a management information system (MIS) providing such data.

Executives in practice do not always have clarity about estimating cash flows. A large number of companies do not include additional working capital while estimating the investment project cash flows. A number of companies also mix up financial flows with operating flows. Although companies claim to estimate cash flows on incremental basis, some of them make no adjustment for sale proceeds of existing assets while computing the project's initial cost. The prevalence of such conceptual confusion has been observed even in the developed countries. For example, in the seventies, a number of UK companies were treating depreciation as cash flows.⁶

In the past, most Indian companies chose an arbitrary period of 5 or 10 years for forecasting cash flows. This was so because companies in India largely depended on government-owned financial institutions for financing their projects, and these institutions required 5 to 10 years forecasts of the project cash flows.

Project Evaluation: The evaluation of projects should be performed by a group of experts who have no axe to grind. For example, the production people may be generally interested in having the most modern type of equipments and increased production even if productivity is expected to be low and goods cannot be sold. This attitude can bias their estimates of cash flows of the proposed projects. Similarly, marketing executives may be too optimistic about the sales prospects of goods manufactured, and overestimate

NOTES

NOTES

the benefits of a proposed new product. It is, therefore, necessary to ensure that projects are scrutinised by an impartial group and that objectivity is maintained in the evaluation process.

A company in practice should take all care in selecting a method or methods of investment evaluation. The criterion selected should be a true measure of the investment's profitability (in terms of cash flows), and it should lead to the net increase in the company's wealth (that is, its benefits should exceed its cost adjusted for time value and risk). It should also be seen that the evaluation criteria do not discriminate between the investment proposals. They should be capable of ranking projects correctly in terms of profitability. The net present value method is theoretically the most desirable criterion as it is a true measure of profitability; it generally ranks projects correctly and is consistent with the wealth maximisation criterion. In practice, however, managers' choice may be governed by other practical considerations also.

A formal financial evaluation of proposed capital expenditures has become a common practice among companies in India. A number of companies have a formal financial evaluation of almost three-fourths of their investment projects. Most companies subject more than 50 per cent of the projects to some kind of formal evaluation. However, projects, such as replacement or worn-out equipment, welfare and statutorily required projects below certain limits, small value items like office equipment or furniture, replacement of assets of immediate requirements, etc., are not often formally evaluated.

Methods of Evaluation: As regards the use of evaluation methods, most Indian companies use payback criterion. In addition to payback and/or other methods, companies also use internal rate of return (IRR) and net present (NPV) methods. A few companies use accounting rate of return (ARR) method. IRR is the second most popular technique in India.

The major reason for payback to be more popular than the DCF techniques is the executives' lack of familiarity with DCF techniques. Other factors are lack of technical people and sometimes unwillingness of top management to use the DCF techniques. One large manufacturing and marketing organisation, for example, thinks that conditions of its business are such that the DCF techniques are not needed. By business conditions the company perhaps means its marketing nature, and its products being in seller's markets. Another company feels that replacement projects are very frequent in the company, and therefore, it is not necessary to use the DCF techniques for such projects. Both these companies have fallacious approaches towards investment analysis. They should subject all capital expenditures to formal evaluation.

The practice of companies in India regarding the use of evaluation criteria is similar to that in USA. Almost four-fifths of US firms use either the internal rate of return or net present value models, but only about one-fifth use such discounting techniques without using the payback period or average rate of return methods.⁷ The tendency of US firms to use naive techniques as supplementary tools has also been reported in recent studies. However, firms in USA have come to depend increasingly on the DCF techniques, particularly IRR. The British companies use both DCF techniques and return on capital, sometimes in combination sometimes solely, in their investment evaluation; the use of payback is widespread.⁸ In recent years the use of the DCF methods has increased in UK, and NPV is more popular than IRR.⁹ However, this increase has not reduced the importance of the traditional methods such as payback and return on investment. Payback continues to be employed by almost all companies.

One significant difference between practices in India and USA is that payback is used in India as a 'primary' method and IRR/NPV as a 'secondary' method, while it is just the reverse in USA. Indian managers feel that payback is a convenient method of communicating an investment's desirability, and it best protects the recovery of capital—a scarce commodity in the developing countries.

Cut-off Rate: In the implementation of a sophisticated evaluation system, the use of a minimum required rate of return is necessary. The required rate of return or the opportunity cost of capital should be based on the riskiness of cash flows of the investment proposal; it is compensation to investors for bearing the risk in supplying capital to finance investment proposals.

Not all companies in India specify the minimum acceptable rate of return. Some of them compute the weighted average cost of capital (WACC) as the discount rate. Unfortunately, all companies do not follow correct methodology of calculating the WACC. Almost all companies use the book value weights.

Business executives in India are becoming increasingly aware of the importance of the cost of capital, but they perhaps lack clarity about its computation. Arbitrary judgment of management also seems to play a role in the assessment of the cost of capital. The fallacious tendency of equating borrowing rate with minimum required rate of return also persists in the case of some companies.¹⁰ In USA, a little more than 50 per cent companies have been found using WACC as cut-off rate.¹¹ In UK, only a very small percentage of firms were found attempting any calculation of the cost of capital.¹² As in USA and UK, companies in India have a tendency to equate the minimum rate with interest rate or cost of specific source of finance. The phenomenon of depending on management judgement for the assessment of the cost of capital is prevalent as much in USA and UK as in India.

Recognition of Risk: The assessment of risk is an important aspect of an investment evaluation. In theory, a number of techniques are suggested to handle risk. Some of them, such as the computer simulation technique are not only quite involved but are also expensive to use. How do companies handle risk in practice?

Companies in India consider the following as the four most important contributors of investment risk—*selling price, product demand, technological changes* and *government policies*. India is fast changing from sellers' market to buyers' market as competition is intensifying in a large number of products; hence uncertainty of selling price and product demand are being realised as important risk factors. Uncertain government policies (in areas such as custom and excise duty and import policy, the foreign investment etc.), of course, are a continuous source of investment risk in developing countries like India.

Sensitivity analysis and **conservative forecasts** are two equally important and widely used methods of handling investment risk in India. Each of these techniques is used by a number of Indian companies with other methods while many other companies use either sensitivity analysis or conservative forecasts with other methods. Some companies also use shorter payback and inflated discount rates (risk-adjusted discount rates).

In USA, risk adjusted discount rate is more popular than the use of payback and sensitivity analysis.^{13, 14} The British companies hardly use sensitivity analysis.¹⁵ The contrasts in risk evaluation practices in India, on the one hand, and USA and UK, on the other, are sharp and significant. Given the complex nature of risk factors in developing

NOTES

NOTES

countries, risk evaluation cannot be handled through a single number such as the NPV calculation based on conservative forecasts or risk-adjusted discount rate. Managers must know the impact on project profitability of the full range of critical variables. An American businessman states: 'there appear to be more corporations using sensitivity analysis than surveys indicate. In some cases firms may not know that what they are undertaking is called 'sensitivity analysis', and it probably is not in the sophisticated, computer oriented sense... Typically, analysts or middle managers eliminate the alternative assumptions and solutions in order to simplify the decision-making process for higher management.'¹⁶

Capital Rationing: Indian companies, by and large, do not have to reject profitable investment opportunities for lack of funds, despite the capital markets not being so well developed. This may be due to the existence of the government-owned financial system, which is always ready to finance profitable projects. Indian companies do not use any mathematical technique to allocate resources under capital shortage which may sometimes arise on account of internally imposed restrictions or management's reluctance to raise capital from outside. Priorities for allocating resources are determined by management, based on the strategic need for and profitability of projects.

Authorization: It may not be feasible in practice to specify standard administrative procedures for approving investment proposals. Screening and selection procedures may differ from one company to another. When large sums of capital expenditures are involved, the authority for the final approval may rest with top management. The approval authority may be delegated for certain types of investment projects. Delegation may be affected subject to the amount of outlay, prescribing the selection criteria and holding the authorised person accountable for results.

Funds are appropriated for capital expenditures after the final selection of investment proposals. The formal plan for the appropriation of funds is called the **capital budget**. Generally, the senior management tightly controls the capital expenditures. Budgetary controls may be rigidly exercised, particularly when a company is facing liquidity problem. The expected expenditure should become a part of the annual capital budget, integrated with the overall budgetary system.

Top management should ensure that funds are spent in accordance with appropriations made in the capital budget. Funds for the purpose of project implementation should be spent only after seeking formal permission from the financial manager or any other authorised person.

In India, as in UK, the power to commit a company to specific capital expenditure and to examine proposals is limited to a few top corporate officials. However, the duties of processing the examination and evaluation of a proposal are somewhat spread throughout the corporate management staff in case of a few companies.

Senior management tightly control capital spending. **Budgetary control** is also exercised rigidly. The expected capital expenditure proposals invariably become a part of the annual capital budget in all companies. Some companies also have formal **long-range plans** covering a period of 3 to 5 years. Some companies feel that long-range plans have a significant influence on the evaluation and funding of capital expenditure proposals.

Control and Monitoring: A capital investment reporting system is required to review and monitor the performance of investment projects after completion and during their life. The follow-up comparison of the actual performance with original estimates

not only ensures better forecasting but also helps to sharpen the techniques for improving future forecasts. Based on the follow-up feedback, the company may reappraise its projects and take remedial action.

Indian companies practice control of capital expenditure through the use of regular project reports. Some companies require quarterly reporting, others need monthly, half-yearly and yet a few companies require continuous reporting. In most of the companies, the evaluation reports include information on expenditure to date, stage of physical completion, and approved and revised total cost.

Most of the companies in reappraising investment proposals, consider comparison between actual and forecast capital cost, saving and rate of return. They perceive the following advantages of reappraisal—(i) improvement in profitability by positioning the project as per the original plan; (ii) ascertainment of errors in investment planning which can be avoided in future; (iii) guidance for future evaluation of projects; and (iv) generation of cost consciousness among the project team. A few companies abandon the project if it becomes uneconomical. The power of review is generally invested with the top executives of the companies in India.

5.3 AVERAGE RATE OF RETURN

The accounting rate of return (ARR), also known as the **return on investment (ROI)**, uses accounting information, as revealed by financial statements, to measure the profitability of an investment. The **accounting rate of return** is the ratio of the average after tax profit divided by the average investment. The average investment would be equal to half of the original investment if it were depreciated constantly. Alternatively, it can be found out by dividing the total of the investment's book values after depreciation by the life of the project. The **accounting rate of return**, thus, is an average rate and can be determined by the following equation:

$$\text{ARR} = \frac{\text{Average income}}{\text{Average investment}} \quad (1)$$

In Equation (1) average income should be defined in terms of earnings after taxes without an adjustment for interest viz. EBIT $(1 - T)$ or net operating profit after tax. Thus

$$\text{ARR} = \frac{\left[\sum_{t=1}^n \text{EBIT}_t (1 - T) \right] / n}{(I_0 + I_n) / 2} \quad (2)$$

where EBIT is earnings before interest and taxes, T tax rate, I_0 book value of investment in the beginning, I_n book value of investment at the end of n number of years.¹⁷

Illustration 5.1: Accounting Rate of Return

A project will cost ₹ 40,000. Its stream of earnings before depreciation, interest and taxes (EBDIT) during first year through five years is expected to be ₹ 10,000, ₹ 12,000, ₹ 14,000, ₹ 16,000 and ₹ 20,000. Assume a 50 per cent tax rate and depreciation on straight-line basis. Project's ARR is computed in Table 5.1.

$$\text{Accounting Rate of Return} = \frac{3,200}{20,000} \times 100 = 16 \text{ per cent}$$

NOTES

Check Your Progress

1. Identify the five phases of capital expenditure planning and control.
2. Define capital budget.
3. Name the two important and widely used methods of handling investment risk in India.

NOTES

A variation of the ARR method is to divide average earnings after taxes by the original cost of the project instead of the average cost. Thus, using this version, the ARR in Illustration 5.1 would be: ₹ 3,200 ÷ ₹ 40,000 × 100 = 8 per cent. This version of the ARR method is less consistent as earnings are averaged but investment is not.¹⁸

Table 5.1 Calculation of Accounting Rate of Return

	(₹)					
<i>Period</i>	<i>1</i>	<i>2</i>	<i>3</i>	<i>4</i>	<i>5</i>	<i>Average</i>
Earnings before depreciation, interest and taxes (EBDIT)	10,000	12,000	14,000	16,000	20,000	14,400
Depreciation	8,000	8,000	8,000	8,000	8,000	8,000
Earnings before interest and taxes (EBIT)	2,000	4,000	6,000	8,000	12,000	6,400
Taxes at 50%	1,000	2,000	3,000	4,000	6,000	3,200
Earnings before interest and after taxes [EBIT (1 – T)]	1,000	2,000	3,000	4,000	6,000	3,200
Book value of investment:						
Beginning	40,000	32,000	24,000	16,000	8,000	
Ending	32,000	24,000	16,000	8,000	—	
Average	36,000	28,000	20,000	12,000	4,000	20,000

Acceptance Rule

As an accept-or-reject criterion, this method will accept all those projects whose ARR is higher than the minimum rate established by the management and reject those projects which have ARR less than the minimum rate. This method would rank a project as number one if it has highest ARR and lowest rank would be assigned to the project with lowest ARR.

Evaluation of ARR Method

The ARR method may claim some merits:

- **Simplicity:** The ARR method is simple to understand and use. It does not involve complicated computations.
- **Accounting data:** The ARR can be readily calculated from the accounting data; unlike in the NPV and IRR methods, no adjustments are required to arrive at cash flows of the project.
- **Accounting profitability:** The ARR rule incorporates the entire stream of income in calculating the project's profitability.

The ARR is a method commonly understood by accountants, and frequently used as a performance measure. As a decision criterion, however, it has serious shortcomings.

- **Cash flows ignored:** The ARR method uses accounting profits, not cash flows, in appraising the projects. Accounting profits are based on arbitrary assumptions and choices and also include non-cash items. It is, therefore, inappropriate to rely on them for measuring the acceptability of the investment projects.
- **Time value ignored:** The averaging of income ignores the time value of money. In fact, this procedure gives more weightage to the distant receipts.

- **Arbitrary cut-off:** The firm employing the ARR rule uses an arbitrary cut-off yardstick. Generally, the yardstick is the firm's current return on its assets (book-value). Because of this, the growth companies earning very high rates on their existing assets may reject profitable projects (i.e., with positive NPVs) and the less profitable companies may accept bad projects (i.e., with negative NPVs).

The ARR method continues to be used as a performance evaluation and control measure in practice. But its use as an investment criterion is certainly undesirable. It may lead to unprofitable allocation of capital.

NOTES

5.4 PAYBACK PERIOD

Payback (PB) is one of the most popular and widely recognized traditional methods of evaluating investment proposals. **Payback** is the number of years required to recover the original cash outlay invested in a project. If the project generates constant annual cash inflows, the payback period can be computed by dividing cash outlay by the annual cash inflow. That is:

$$\text{Payback} = \frac{\text{Initial Investment}}{\text{Annual Cash Inflow}} = \frac{C_0}{C} \quad (3)$$

Illustration 5.2: Payback (Constant Cash Flows)

Assume that a project requires an outlay of ₹ 50,000 and yields annual cash inflow of ₹ 12,500 for 7 years. The payback period for the project is:

$$\text{PB} = \frac{\text{Rs } 50,000}{\text{Rs } 12,500} = 4 \text{ years}$$

Unequal cash flows: In case of unequal cash inflows, the payback period can be found out by adding up the cash inflows until the total is equal to the initial cash outlay. Consider the following example.

Illustration 5.3: Payback (Uneven Cash Flows)

Suppose that a project requires a cash outlay of ₹ 20,000, and generates cash inflows of ₹ 8,000; ₹ 7,000; ₹ 4,000; and ₹ 3,000 during the next 4 years. What is the project's payback? When we add up the cash inflows, we find that in the first three years ₹ 19,000 of the original outlay is recovered. In the fourth year cash inflow generated is ₹ 3,000 and only ₹ 1,000 of the original outlay remains to be recovered. Assuming that the cash inflows occur evenly during the year, the time required to recover ₹ 1,000 will be $(\text{₹ } 1,000 / \text{₹ } 3,000) \times 12 \text{ months} = 4 \text{ months}$. Thus, the payback period is 3 years and 4 months.

Acceptance Rule

Many firms use the payback period as an investment evaluation criterion and a method of ranking projects. They compare the project's payback with a predetermined, standard payback. The project would be accepted if its payback period is less than the maximum or **standard payback** period set by management. As a ranking method, it gives highest ranking to the project, which has the shortest payback period and lowest ranking to the project with highest payback period. Thus, if the firm has to choose between two mutually exclusive projects, the project with shorter payback period will be selected.

Check Your Progress

4. Define accounting rate of return.
5. What are the merits of ARR method?

Evaluation of Payback

Payback is a popular investment criterion in practice. It is considered to have certain virtues.

NOTES

- **Simplicity:** The most significant merit of payback is that it is simple to understand and easy to calculate. The business executives consider the simplicity of method as a virtue. This is evident from their heavy reliance on it for appraising investment proposals in practice.
- **Cost effective:** Payback method costs less than most of the sophisticated techniques that require a lot of the analysts' time and the use of computers.
- **Short-term effects:** A company can have more favourable short-run effects on earnings per share by setting up a shorter standard payback period.¹⁹ It should, however, be remembered that this may not be a wise long-term policy as the company may have to sacrifice its future growth for current earnings.
- **Risk shield:** The risk of the project can be tackled by having a shorter standard payback period as it may ensure guarantee against loss. A company has to invest in many projects where the cash inflows and life expectancies are highly uncertain. Under such circumstances, payback may become important, not so much as a measure of profitability but as a means of establishing an upper bound on the acceptable degree of risk.²⁰
- **Liquidity:** The emphasis in payback is on the early recovery of the investment. Thus, it gives an insight into the liquidity of the project. The funds so released can be put to other uses.

In spite of its simplicity and the so-called virtues, the payback may not be a desirable investment criterion since it suffers from a number of serious **limitations**:

- **Cash flows after payback:** Payback fails to take account of the cash inflows earned after the payback period. For example, consider the following projects X and Y:

Project	Cash Flows (₹)				Payback	NPV
	C_0	C_1	C_2	C_3		
X	- 4,000	0	4,000	2,000	2 years	+ 806
Y	- 4,000	2,000	2,000	0	3 years	- 530

As per the payback rule, both the projects are equally desirable since both return the investment outlay in two years. If we assume an opportunity cost of 10 per cent, Project X yields a positive net present value of ₹ 806 and Project Y yields a negative net present value of ₹ 530. As per the NPV rule, Project X should be accepted and Project Y rejected. Payback rule gave wrong results because it failed to consider ₹ 2,000 cash flow in third year for Project X.

- **Cash flows ignored:** Payback is not an appropriate method of measuring the profitability of an investment project as it does not consider all cash inflows yielded by the project. Considering Project X again, payback rule did not take into account its entire series of cash flows.
- **Cash flow patterns:** Payback fails to consider the pattern of cash inflows, i.e., magnitude and timing of cash inflows. In other words, it gives equal weights to

returns of equal amounts even though they occur in different time periods. For example, compare the following projects *C* and *D* where they involve equal cash outlay and yield equal total cash inflows over equal time periods:

Project	Cash Flows (₹)				Payback	NPV
	C_0	C_1	C_2	C_3		
<i>C</i>	– 5,000	3,000	2,000	2,000	2 years	+ 881
<i>D</i>	– 5,000	2,000	3,000	2,000	2 years	+ 798

Using payback period, both projects are equally desirable. But Project *C* *should be* preferable as larger cash inflows come earlier in its life. This is indicated by the NPV rule; project *C* has higher NPV (₹ 881) than Project *D* (₹ 798) at 10 per cent opportunity cost. It should be thus clear that payback is not a measure of profitability. As such, it is dangerous to use it as a decision criterion.

- **Administrative difficulties:** A firm may face difficulties in determining the maximum acceptable payback period. There is no rational basis for setting a maximum payback period. It is generally a subjective decision.
- **Inconsistent with shareholder value:** Payback is not consistent with the objective of maximising the market value of the firm's shares. Share values do not depend on payback periods of investment projects.²¹

Let us re-emphasise that the payback is not a valid method for evaluating the acceptability of the investment projects. It can, however, be used along with the NPV rule as a first step in roughly screening the projects. In practice, the use of DCF techniques has been increasing but payback continues to remain a popular and primary method of investment evaluation (Exhibit 5.1).

Exhibit 5.1: Capital Budgeting Methods in Practice

- In a study of the capital budgeting practices of fourteen medium to large size companies in India, it was found that all companies, except one, used payback. With payback and/or other techniques, about two-thirds of companies used IRR and about two-fifths NPV. IRR was found to be the second most popular method.
- The reasons for the popularity of payback in order of significance were stated to be its *simplicity to use and understand*, *its emphasis on the early recovery of investment* and *focus on risk*.
- It was also found that one-third of companies always insisted on the computation of payback for all projects, one-third for majority of projects and remaining for some of the projects. For about two-thirds of companies standard payback ranged between 3 and 5 years.
- Reasons for the secondary role of DCF techniques in India included *difficulty in understanding and using these techniques*, *lack of qualified professionals* and *unwillingness of top management* to use DCF techniques. One large manufacturing and marketing organisation mentioned that conditions of its business were such that DCF techniques were not needed. Yet another company stated that replacement projects were very frequent in the company, and it was not considered necessary to use DCF techniques for evaluating such projects.

Source: Pandey, I.M., "Capital Budgeting Practices of Indian Companies", *MDI Management Journal*, Vol. 2, No. 1 (Jan. 1989).

NOTES

NOTES

Payback Reciprocal and the Rate of Return

Payback is considered theoretically useful in a few situations. One significant argument in favour of payback is that its reciprocal is a good approximation of the rate of return under certain conditions.²²

The payback period is defined as follows:

$$\text{Payback} = \frac{\text{Initial investment}}{\text{Annual cash inflow (annuity)}} = \frac{C_0}{C} \quad (4)$$

The formula for the present value of an annuity is given by the following equation (i in the original equation is being replaced by r , the internal rate of return).

$$C_0 = C \left[\frac{1 - \frac{1}{(1+r)^n}}{r} \right] = \frac{C}{r} - \frac{C}{r} \left[\frac{1}{(1+r)^n} \right]$$

Multiplying both sides by r , we get

$$rC_0 = C - C \left[\frac{1}{(1+r)^n} \right]$$

Solving for r , we find

$$r = \frac{C}{C_0} - \frac{C}{C_0} \left[\frac{1}{(1+r)^n} \right] \quad (5)$$

where C_0 is the initial investment, C is annual cash inflow, r is rate of return and n is the life of investment.

In Equation (5), the first right-hand term is the reciprocal of the payback period. The second right-hand term is payback reciprocal multiplied by $1/(1+r)^n$. If n is very large or extends to infinity, the second term becomes insignificant (almost equal to zero), and we are left with the term C/C_0 . Thus, IRR is equal to the reciprocal of payback.²³

The reciprocal of payback will be a close approximation of the internal rate of return if the following two conditions are satisfied:

- The life of the project is large or at least twice the payback period.
- The project generates equal annual cash inflows.

The payback reciprocal is a useful technique to quickly estimate the true rate of return. But its major limitation is that every investment project does not satisfy the conditions on which this method is based. When the useful life of the project is not at least twice the payback period, the payback reciprocal will always exceed the rate of return. Similarly, it cannot be used as an approximation of the rate of return if the project yields uneven cash inflows.

Check Your Progress

6. Define payback.
7. State the limitation of payback reciprocal.

5.5 PRESENT VALUE METHOD

The net present value (NPV) method is the classic economic method of evaluating the investment proposals. It is a DCF technique that explicitly recognizes the time value of

money. It correctly postulates that cash flows arising at different time periods differ in value and are comparable only when their equivalents—present values—are found out. The following steps are involved in the calculation of NPV:

- Cash flows of the investment project should be forecasted based on realistic assumptions.
- Appropriate discount rate should be identified to discount the forecasted cash flows. The appropriate discount rate is the project's opportunity cost of capital, which is equal to the required rate of return expected by investors on investments of equivalent risk.
- Present value of cash flows should be calculated using the opportunity cost of capital as the discount rate.
- Net present value should be found out by subtracting present value of cash outflows from present value of cash inflows. The project should be accepted if NPV is positive (i.e., $NPV > 0$).

Let us consider an example.

Illustration 5.4: Calculating Net Present Value

Assume that Project X costs ₹ 2,500 now and is expected to generate year-end cash inflows of ₹ 900, ₹ 800, ₹ 700, ₹ 600 and ₹ 500 in years 1 through 5. The opportunity cost of the capital may be assumed to be 10 per cent.

The net present value for Project X can be calculated by referring to the present value table (Table C at the end of the book). The calculations are shown below:

$$\begin{aligned}
 NPV &= \left[\frac{\text{Rs } 900}{(1+0.10)} + \frac{\text{Rs } 800}{(1+0.10)^2} + \frac{\text{Rs } 700}{(1+0.10)^3} + \frac{\text{Rs } 600}{(1+0.10)^4} + \frac{\text{Rs } 500}{(1+0.10)^5} \right] - \text{Rs } 2,500 \\
 NPV &= [\text{Rs } 900(PVF_{1, 0.10}) + \text{Rs } 800(PVF_{2, 0.10}) + \text{Rs } 700(PVF_{3, 0.10}) \\
 &\quad + \text{Rs } 600(PVF_{4, 0.10}) + \text{Rs } 500(PVF_{5, 0.10})] - \text{Rs } 2,500 \\
 NPV &= [\text{Rs } 900 \times 0.909 + \text{Rs } 800 \times 0.826 + \text{Rs } 700 \times 0.751 + \text{Rs } 600 \times 0.683 + \text{Rs } 500 \times 0.620] - \text{Rs } 2,500 \\
 NPV &= \text{Rs } 2,725 - \text{Rs } 2,500 = + \text{Rs } 225
 \end{aligned}$$

Project X's present value of cash inflows (₹ 2,725) is greater than that of cash outflow (₹ 2,500). Thus, it generates a positive net present value ($NPV = + ₹ 225$). Project X adds to the wealth of owners; therefore, it should be accepted.

The formula for the net present value can be written as follows:

$$\begin{aligned}
 NPV &= \left[\frac{C_1}{(1+k)} + \frac{C_2}{(1+k)^2} + \frac{C_3}{(1+k)^3} + \dots + \frac{C_n}{(1+k)^n} \right] - C_0 \\
 NPV &= \sum_{t=1}^n \frac{C_t}{(1+k)^t} - C_0 \quad (6)
 \end{aligned}$$

where $C_1, C_2, \dots$ represent net cash inflows in year 1, 2, ..., k is the opportunity cost of capital, C_0 is the initial cost of the investment and n is the expected life of the investment. It should be noted that the cost of capital, k , is assumed to be known and is constant.

Why is NPV Important?

A question may be raised: why should a financial manager invest ₹ 2,500 in Project X? Project X should be undertaken if it is best for the company's shareholders; they would like their shares to be as valuable as possible. Let us assume that the total market value

NOTES

NOTES

of a hypothetical company is ₹ 10,000, which includes ₹ 2,500 cash that can be invested in Project X. Thus, the value of the company's other assets must be ₹ 7,500. The company has to decide whether it should spend cash and accept Project X or to keep the cash and reject Project X. Clearly Project X is desirable since its *PV* (₹ 2,725) is greater than the ₹ 2,500 cash. If Project X is accepted, the total market value of the firm will be: ₹ 7,500 + *PV* of Project X = ₹ 7,500 + ₹ 2,725 = ₹ 10,225; that is, an increase by ₹ 225. The company's total market value would remain only ₹ 10,000 if Project X were rejected.

Why should the *PV* of Project X reflect in the company's market value? To answer this question, let us assume that a new company X with Project X as the only asset is formed. What is the value of the company? We know that the market value of a company's shares is equal to the present value of the expected dividends. Since Project X is the only asset of Company X, the expected dividends would be equal to the forecasted cash flows from Project X. Investors would discount the forecasted dividends at a rate of return expected on securities equivalent in risk to company X. The rate used by investors to discount dividends is exactly the rate, which we should use to discount cash flows of Project X. The calculation of the *PV* of Project X is a replication of the process, which shareholders will be following in valuing the shares of company X. Once we find out the value of Project X, as a separate venture, we can add it to the value of other assets to find out the portfolio value.



Excel Application 5.1: Calculation of NPV

We can easily calculate NPV using the Excel financial function for NPV. The spreadsheet on the right side gives the cash flows of the project. We write the NPV formula in column C8: =NPV(0.10,C3:C7)+C2. You may note that 0.10 (10 per cent) is the discount rate. The project cash flows from year 1 through 5 are contained in column C3 through column C7. The initial cash flow (that is, cash flow in year 0) is added.

	A	B	C	D	E
1	Year	Cash flow		PVF at 10%	PV
2	0	C ₀	-2500	1.000	-2500
3	1	C ₁	900	0.909	818
4	2	C ₂	800	0.826	661
5	3	C ₃	700	0.751	526
6	4	C ₄	600	0.683	410
7	5	C ₅	500	0.621	310
8		NPV	226	SUM(E2:E7)	226
9		NPV(0.1,C3:C7)+C2			
10					

The difficult part in the calculation of the *PV* of an investment project is the precise measurement of the discount rate. Funds available with a company can either be invested in projects or given to shareholders. Shareholders can invest funds distributed to them in financial assets. Therefore, the discount rate is the opportunity cost of investing in projects rather than in capital markets. Obviously, the opportunity cost concept makes sense when financial assets are of equivalent risk as compared to the project.

Table 5.1 Interpretation of NPV

	Amount outstanding in the beginning	Return on outstanding amount at 10%	Total outstanding flows	Repayment from cash at the end	Balance outstanding
Year	₹	₹	₹	₹	₹
1	2,725.00	272.50	2,997.50	900	2,097.50
2	2,097.50	209.75	2,307.25	800	1,507.25
3	1,507.25	150.73	1,657.98	700	957.98
4	957.98	95.80	1,053.78	600	453.78
5	453.78	45.38	499.16	500	(0.84)*

* Rounding off error.

An alternate interpretation of the positive net present value of an investment is that it represents the maximum amount a firm would be ready to pay for purchasing the opportunity of making investment, or the amount at which the firm would be willing to sell the right to invest without being financially worse-off. The net present value (₹ 225) can also be interpreted to represent the amount the firm could raise at the required rate of return (10%), in addition to the initial cash outlay (₹ 2,500), to distribute immediately to its shareholders and by the end of the projects' life to have paid off all the capital raised and return on it.²⁴ The point is illustrated by the calculations shown in Table 5.1.

Calculations in Table 5.1 are based on the assumption that the firm chooses to receive the cash benefit resulting from the investment in the year it is made. Any pattern of cash receipts, such that the net present value is equal to ₹ 225, can be selected. Thus, if the firm raises ₹ 2,500 (the initial outlay) instead of ₹ 2,725 (initial outlay *plus* net present value) at 10 per cent rate of return, at the end of fifth year after having paid the principal sum together with interest, it would be left with ₹ 363, whose present value at the beginning of the first year at 10 per cent discount rate is ₹ 225. It should be noted that the gain to shareholders would be more if the rate of raising money is less than 10 per cent. (Why?)

Acceptance Rule

It should be clear that the acceptance rule using the NPV method is to accept the investment project if its net present value is positive ($NPV > 0$) and to reject it if the net present value is negative ($NPV < 0$). Positive NPV contributes to the net wealth of the shareholders, which should result in the increased price of a firm's share. The positive net present value will result only if the project generates cash inflows at a rate higher than the opportunity cost of capital. A project with zero NPV ($NPV = 0$) may be accepted. A zero NPV implies that project generates cash flows at a rate just equal to the opportunity cost of capital. The NPV acceptance rules are:

- Accept the project when NPV is positive $NPV > 0$
- Reject the project when NPV is negative $NPV < 0$
- May accept the project when NPV is zero $NPV = 0$

The NPV method can be used to select between mutually exclusive projects; the one with the higher NPV should be selected. Using the NPV method, projects would be ranked in order of net present values; that is, first rank will be given to the project with highest positive net present value and so on.

NOTES

Evaluation of the NPV Method

NPV is the true measure of an investment's profitability. It provides the most acceptable investment rule for the following reasons:

NOTES

- **Time value:** It recognises the time value of money—a rupee received today is worth more than a rupee received tomorrow.
- **Measure of true profitability:** It uses all cash flows occurring over the entire life of the project in calculating its worth. Hence, it is a measure of the project's true profitability. The NPV method relies on estimated cash flows and the discount rate rather than any arbitrary assumptions, or subjective considerations.
- **Value-additivity:** The discounting process facilitates measuring cash flows in terms of present values; that is, in terms of equivalent, current rupees. Therefore, the NPVs of projects can be added. For example, $NPV(A + B) = NPV(A) + NPV(B)$. This is called the **value-additivity principle**. It implies that if we know the NPVs of individual projects, the value of the firm will increase by the *sum* of their NPVs. We can also say that if we know values of individual assets, the firm's value can simply be found by adding their values. The value-additivity is an important property of an investment criterion because it means that each project can be evaluated, independent of others, on its own merit.
- **Shareholder value:** The NPV method is always consistent with the objective of the shareholder value maximisation. This is the greatest virtue of the method.

Are there any limitations in using the NPV rule? The NPV method is a theoretically sound method. In practice, it may pose some computational problems.

- **Cash flow estimation:** The NPV method is easy to use if forecasted cash flows are known. In practice, it is quite difficult to obtain the estimates of cash flows due to uncertainty.
- **Discount rate:** It is also difficult in practice to precisely measure the discount rate.
- **Mutually exclusive projects:** Further, caution needs to be applied in using the NPV method when alternative (mutually exclusive) projects with unequal lives, or under funds constraint are evaluated. The NPV rule may not give unambiguous results in these situations.
- **Ranking of projects:** It should be noted that the ranking of investment projects as per the NPV rule is not independent of the discount rates.²⁵ Let us consider an example.

Suppose two projects—A and B—both costing ₹ 50 each. Project A returns ₹ 100 after one year and ₹ 25 after two years. On the other hand, Project B returns ₹ 30 after one year and ₹ 100 after two years. At discount rates of 5 per cent and 10 per cent, the NPV of projects and their ranking are as follows:

	<i>NPV at 5%</i>	<i>Rank</i>	<i>NPV at 10%</i>	<i>Rank</i>
Project A	67.92	II	61.57	I
Project B	69.27	I	59.91	II

It can be seen that the project ranking is reversed when the discount rate is changed from 5 per cent to 10 per cent. The reason lies in the cash flow patterns. The

impact of the discounting becomes more severe for the cash flow occurring later in the life of the project; the higher is the discount rate, the higher would be the discounting impact. In the case of Project B, the larger cash flows come later in the life. Their present value will decline as the discount rate increases.

5.6 INTERNAL RATE OF RETURN

The internal rate of return (IRR) method is another discounted cash flow technique, which takes account of the magnitude and timing of cash flows.²⁶ Other terms used to describe the IRR method are yield on an investment, marginal efficiency of capital, rate of return over cost, time-adjusted rate of internal return and so on. The concept of internal rate of return is quite simple to understand in the case of a one-period project. Assume that you deposit ₹ 10,000 with a bank and would get back ₹ 10,800 after one year. The true rate of return on your investment would be:

$$\text{Rate of return} = \frac{10,800 - 10,000}{10,000} = \frac{10,800}{10,000} - 10,000 = 1.08 - 1 = 0.08 \text{ or, } 8\%$$

The amount that you would obtain in the future (₹ 10,800) would consist of your investment (₹ 10,000) plus return on your investment ($0.08 \times ₹ 10,000$):

$$10,000(1.08) = 10,800$$

$$10,000 = \frac{10,800}{(1.08)}$$

You may observe that the rate of return of your investment (8 per cent) makes the discounted (present) value of your cash inflow (₹ 10,800) equal to your investment (₹ 10,000).

We can now develop a formula for the rate of return (r) on an investment (C_0) that generates a single cash flow after one period (C_1) as follows:

$$r = \frac{C_1 - C_0}{C_0} = \frac{C_1}{C_0} - 1 \quad (7)$$

Equation (7) can be rewritten as follows:

$$\begin{aligned} \frac{C_1}{C_0} &= 1 + r \\ C_0 &= \frac{C_1}{(1 + r)} \end{aligned} \quad (8)$$

From Equation (8), you may notice that the rate of return, r , depends on the project's cash flows, rather than any outside factor. Therefore, it is referred to as the internal rate of return. The **internal rate of return** (IRR) is the rate that equates the investment outlay with the present value of cash inflow received after one period. This also implies that the rate of return is the discount rate which makes NPV = 0. There is no satisfactory way of defining the true rate of return of a long-term asset. IRR is the best available concept. We shall see that although it is a very frequently used concept in finance, yet at times it can be a misleading measure of investment worth.²⁷ IRR can be determined by solving the following equation for r :

NOTES

Check Your Progress

8. What is net present value method?
9. What is value-additivity principle?

NOTES

$$C_0 = \frac{C_1}{(1+r)} + \frac{C_2}{(1+r)^2} + \frac{C_3}{(1+r)^3} + \dots + \frac{C_n}{(1+r)^n}$$

$$C_0 = \sum_{t=1}^n \frac{C_t}{(1+r)^t}$$

$$\sum_{t=1}^n \frac{C_t}{(1+r)^t} - C_0 = 0 \quad (9)$$

It can be noticed that the IRR equation is the same as the one used for the NPV method. In the NPV method, the required rate of return, k , is known and the net present value is found, while in the IRR method the value of r has to be determined at which the net present value becomes zero.

Uneven Cash Flows: Calculating IRR by Trial and Error

The value of r in Equation (9) can be found out by trial and error. The approach is to select any discount rate to compute the present value of cash inflows. If the calculated present value of the expected cash inflow is lower than the present value of cash outflows, a lower rate should be tried. On the other hand, a higher value should be tried if the present value of inflows is higher than the present value of outflows. This process will be repeated unless the net present value becomes zero. The following illustration explains the procedure of calculating IRR.

Illustration 5.5: Trial and Error Method for Calculating IRR

A project costs ₹ 16,000 and is expected to generate cash inflows of ₹ 8,000, ₹ 7,000 and ₹ 6,000 at the end of each year for next 3 years. We know that IRR is the rate at which project will have a zero NPV. As a first step, we try (arbitrarily) a 20 per cent discount rate. The project's NPV at 20 per cent is:

$$\begin{aligned} \text{NPV} &= -\text{Rs } 16,000 + \text{Rs } 8,000(\text{PVF}_{1, 0.20}) + \text{Rs } 7,000(\text{PVF}_{2, 0.20}) + \text{Rs } 6,000(\text{PVF}_{3, 0.20}) \\ &= -\text{Rs } 16,000 + \text{Rs } 8,000 \times 0.833 + \text{Rs } 7,000 \times 0.694 + \text{Rs } 6,000 \times 0.579 \\ &= -\text{Rs } 16,000 + \text{Rs } 14,996 = -\text{Rs } 1,004 \end{aligned}$$

A negative NPV of ₹ 1,004 at 20 per cent indicates that the project's true rate of return is lower than 20 per cent. Let us try 16 per cent as the discount rate. At 16 per cent, the project's NPV is:

$$\begin{aligned} \text{NPV} &= -\text{Rs } 16,000 + \text{Rs } 8,000(\text{PVF}_{1, 0.16}) + \text{Rs } 7,000(\text{PVF}_{2, 0.16}) + \text{Rs } 6,000(\text{PVF}_{3, 0.16}) \\ &= -\text{Rs } 16,000 + \text{Rs } 8,000 \times 0.862 + \text{Rs } 7,000 \times 0.743 + \text{Rs } 6,000 \times 0.641 \\ &= -\text{Rs } 16,000 + \text{Rs } 15,943 = -\text{Rs } 57 \end{aligned}$$

Since the project's NPV is still negative at 16 per cent, a rate lower than 16 per cent should be tried. When we select 15 per cent as the trial rate, we find that the project's NPV is ₹ 200:

$$\begin{aligned} \text{NPV} &= -\text{Rs } 16,000 + \text{Rs } 8,000(\text{PVF}_{1, 0.15}) + \text{Rs } 7,000(\text{PVF}_{2, 0.15}) + \text{Rs } 6,000(\text{PVF}_{3, 0.15}) \\ &= -\text{Rs } 16,000 + \text{Rs } 8,000 \times 0.870 + \text{Rs } 7,000 \times 0.756 + \text{Rs } 6,000 \times 0.658 \\ &= -\text{Rs } 16,000 + \text{Rs } 16,200 = \text{Rs } 200 \end{aligned}$$

The true rate of return should lie between 15–16 per cent. We can find out a close approximation of the rate of return by the method of linear interpolation as follows:

		<i>Difference</i>
PV required	₹ 16,000	
		200
PV at lower rate, 15%	16,200	
		257
PV at higher rate, 16%	15,943	
$r = 15\% + (16\% - 15\%)200/257$		
$= 15\% + 0.80\% = 15.8\%$		

NOTES

Level Cash Flows

An easy procedure can be followed to calculate the IRR for a project that produces level or equal cash flows each period. To illustrate, let us assume that an investment would cost ₹ 20,000 and provide annual cash inflow of ₹ 5,430 for 6 years. If the opportunity cost of capital is 10 per cent, what is the investment's NPV? The ₹ 5,430 is an annuity for 6 years. The NPV can be found as follows:

$$\text{NPV} = -\text{Rs } 20,000 + \text{Rs } 5,430(\text{PVFA}_{6,0.10}) = -\text{Rs } 20,000 + \text{Rs } 5,430 \times 4.355 = \text{Rs } 3,648$$

How much is the project's IRR? The IRR of the investment can be found out as follows:

$$\begin{aligned} \text{NPV} &= -\text{Rs } 20,000 + \text{Rs } 5,430(\text{PVFA}_{6,r}) = 0 \\ \text{Rs } 20,000 &= \text{Rs } 5,430(\text{PVFA}_{6,r}) \\ \text{PVFA}_{6,r} &= \frac{\text{Rs } 20,000}{\text{Rs } 5,430} = 3.683 \end{aligned}$$

The rate, which gives a PVFA of 3.683 for 6 years, is the project's internal rate of return. Looking up PVFA in Table (given at the end of the book) across the 6-year row, we find it approximately under the 16 per cent column. Thus, 16 per cent is the project's IRR that equates the present value of the initial cash outlay (₹ 20,000) with the constant annual cash inflows (₹ 5,430 per year) for 6 years.

NPV Profile and IRR

We repeat to emphasise that NPV of a project declines as the discount rate increases, and for discount rates higher than the project's IRR, NPV will be negative. NPV profile of the project at various discount rates is shown in Table 5.2 and Figure 5.1. At 16 per cent, the NPV is zero; therefore, it is the IRR of the project. As you may notice, we have used the Excel spreadsheet to make the computations and create the chart using the Excel chart wizard.

Table 5.2 NPV Profile

1 NPV Profile			
2	Cash Flow	Discount rate	NPV
3	- 20000	0%	12,580
4	5430	5%	7,561
5	5430	10%	3,649
6	5430	15%	550
7	5430	16%	0
8	5430	20%	(1,942)
9	5430	25%	(3,974)

NOTES

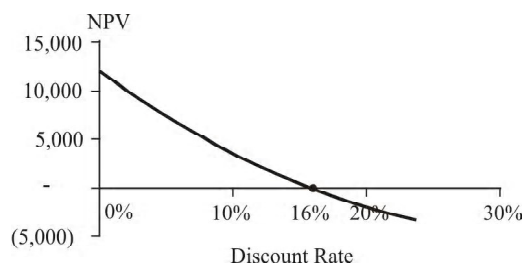


Fig. 5.1 NPV Profile

Acceptance Rule

The accept-or-reject rule, using the IRR method, is to accept the project if its internal rate of return is higher than the opportunity cost of capital ($r > k$). Note that k is also known as the required rate of return, or the cut-off, or hurdle rate. The project shall be rejected if its internal rate of return is lower than the opportunity cost of capital ($r < k$). The decision maker may remain indifferent if the internal rate of return is equal to the opportunity cost of capital. Thus the IRR acceptance rules are:

- Accept the project when $r > k$
- Reject the project when $r < k$
- May accept the project when $r = k$

The reasoning for the acceptance rule becomes clear if we plot NPVs and discount rates for the project given in Table 5.2 on a graph like Figure 5.1. It can be seen that if the discount rate is less than 16 per cent IRR, then the project has *positive* NPV; if it is equal to IRR, the project has a *zero* NPV; and if it is greater than IRR, the project has negative NPV. Thus, when we compare IRR of the project with the opportunity cost of capital, we are in fact trying to ascertain whether the project's NPV is positive or not. In case of independent projects, IRR and NPV rules will give the same results if the firm has no shortage of funds.

**Excel Application 5.2:
CALCULATION OF IRR**

We can easily calculate IRR using the Excel function for IRR. The spreadsheet below gives the cash flows of the project. We write the IRR formula in column C7: =IRR(C3:C6). The project cash flows, including the cash outlay in the beginning (C_0 in year 0) are contained in column C3 through column C6. It is optional to include the "guess" rate in the formula.

	A	B	C	D
1	IRR of An Investment Project			
2	Year	Cash Flow (Rs)		
3	0	C_0	-16000	
4	1	C_1	8000	
5	2	C_2	7000	
6	3	C_3	6000	
7		IRR	15.8%	IRR(C3:C6)

Evaluation of IRR Method

IRR method is like the NPV method. It is a popular investment criterion since it measures profitability as a percentage and can be easily compared with the opportunity cost of capital. IRR method has following merits:

- **Time value:** The IRR method recognises the time value of money.
- **Profitability measure:** It considers all cash flows occurring over the entire life of the project to calculate its rate of return.
- **Acceptance rule:** It generally gives the same acceptance rule as the NPV method.
- **Shareholder value:** It is consistent with the shareholders' wealth maximisation objective. Whenever a project's IRR is greater than the opportunity cost of capital, the shareholders' wealth will be enhanced.

Like the NPV method, the IRR method is also theoretically a sound investment evaluation criterion. However, IRR rule can give misleading and inconsistent results under certain circumstances. Here we briefly mention the problems that IRR method may suffer from.

- **Multiple rates:** A project may have multiple rates, or it may not have a unique rate of return. As we explain later on, these problems arise because of the mathematics of IRR computation.
- **Mutually exclusive projects:** It may also fail to indicate a correct choice between mutually exclusive projects under certain situations. This pitfall of the IRR method is elaborated later on in this unit.
- **Value additivity:** Unlike in the case of the NPV method, the value additivity principle does not hold when the IRR method is used—IRRs of projects do not add.²⁸ Thus, for Projects *A* and *B*, $IRR(A) + IRR(B)$ need not be equal to $IRR(A + B)$. Consider an example given below.

The NPV and IRR of Projects *A* and *B* are given below:

Project	C_0 (₹)	C_1 (₹)	NPV @ 10% (₹)	IRR (%)
A	- 100	+ 120	+ 9.1	20.0
B	- 150	+ 168	+ 2.7	12.0
A + B	- 250	+ 288	+ 11.8	15.2

It can be seen from the example that NPVs of projects add:

$$NPV(A) + NPV(B) = NPV(A + B) = 9.1 + 2.7 = 11.8, \text{ while}$$

$$IRR(A) + IRR(B) \neq IRR(A + B) = 20\% + 12\% \neq 15.2\%$$

5.7 SUMMARY

- Capital investments should include all those expenditures, which are expected to produce benefits to the firm over a long period of time, and encompass both tangible and intangible assets.
- The available literature puts the maximum emphasis on the evaluation phase. Two reasons may be attributed to this bias. First, this phase is easily amenable to a structured, quantitative analysis. Second, it is considered to be the most important phase by academicians.
- Sensitivity analysis and conservative forecasts are two equally important and widely used methods of handling investment risk in India.

NOTES

Check Your Progress

10. Define internal rate of return.
11. What is the main difference in the concepts of NPV and IRR?

NOTES

- The formal plan for the appropriation of funds is called the capital budget.
- The accounting rate of return is the ratio of the average after tax profit divided by the average investment. The average investment would be equal to half of the original investment if it were depreciated constantly.
- The ARR is a method commonly understood by accountants, and frequently used as a performance measure.
- The payback (PB) is one of the most popular and widely recognized traditional methods of evaluating investment proposals. Payback is the number of years required to recover the original cash outlay invested in a project.
- Payback is a popular investment criterion in practice. It is considered to have certain virtues.
- In spite of its simplicity and the so-called virtues, the payback may not be a desirable investment criterion since it suffers from a number of serious limitations.
- Payback is considered theoretically useful in a few situations. One significant argument in favour of payback is that its reciprocal is a good approximation of the rate of return under certain conditions.
- The net present value (NPV) method is the classic economic method of evaluating the investment proposals. It is a DCF technique that explicitly recognizes the time value of money. It correctly postulates that cash flows arising at different time periods differ in value and are comparable only when their equivalents—present values—are found out.
- NPV is the true measure of an investment's profitability.
- The internal rate of return (IRR) method is another discounted cash flow technique, which takes account of the magnitude and timing of cash flows.
- The internal rate of return (IRR) is the rate that equates the investment outlay with the present value of cash inflow received after one period.
- IRR method is like the NPV method. It is a popular investment criterion since it measures profitability as a percentage and can be easily compared with the opportunity cost of capital.

5.8 KEY TERMS

- **Capital budget:** The formal plan for the appropriation of funds is called the capital budget.
- **Accounting rate of return:** The accounting rate of return is the ratio of the average after tax profit divided by the average investment.
- **Payback:** Payback is the number of years required to recover the original cash outlay invested in a project.

5.9 ANSWERS TO 'CHECK YOUR PROGRESS'

1. At least five phases of capital expenditure planning and control can be identified:
 - Identification (or origination) of investment opportunities
 - Development of forecasts of benefits and costs

- Evaluation of the net benefits
 - Authorization for progressing and spending capital expenditure
 - Control of capital projects
2. The formal plan for the appropriation of funds is called the capital budget.
 3. Sensitivity analysis and conservative forecasts are two equally important and widely used methods of handling investment risk in India.
 4. The accounting rate of return is the ratio of the average after tax profit divided by the average investment.
 5. The ARR method may claim some merits:
 - Simplicity: The ARR method is simple to understand and use. It does not involve complicated computations.
 - Accounting data: The ARR can be readily calculated from the accounting data; unlike in the NPV and IRR methods, no adjustments are required to arrive at cash flows of the project.
 - Accounting profitability: The ARR rule incorporates the entire stream of income in calculating the project's profitability.
 6. Payback is the number of years required to recover the original cash outlay invested in a project.
 7. The payback reciprocal is a useful technique to quickly estimate the true rate of return. But its major limitation is that every investment project does not satisfy the conditions on which this method is based.
 8. The net present value (NPV) method is the classic economic method of evaluating the investment proposals. It is a DCF technique that explicitly recognizes the time value of money. It correctly postulates that cash flows arising at different time periods differ in value and are comparable only when their equivalents—present values—are found out.
 9. The discounting process facilitates measuring cash flows in terms of present values; that is, in terms of equivalent, current rupees. Therefore, the NPVs of projects can be added. For example, $NPV(A + B) = NPV(A) + NPV(B)$. This is called the value-additivity principle.
 10. The internal rate of return (IRR) is the rate that equates the investment outlay with the present value of cash inflow received after one period.
 11. In the NPV method, the required rate of return, k , is known and the net present value is found, while in the IRR method the value of r has to be determined at which the net present value becomes zero.

NOTES

5.10 QUESTIONS AND EXERCISES

Short Answer Questions

1. What are the shortcomings of ARR method?
2. What are the advantages of reappraisal perceived by companies?
3. Write a short note on steps involved in the calculation of NPV.

NOTES

Long Answer Questions

1. Discuss the merits and limitations of payback.
2. Explain the reasons behind NPV being considered as the most acceptable investment rule. What are the limitations of the NPV method?
3. Discuss the merits and demerits of IRR method.

5.11 FURTHER READING

Pandey, IM. 2009. *Financial Management*. India: Vikas Publishing Pvt Ltd.

Kuchal, SC. 1999. *Financial Management: An Analytical and Conceptual Approach*. India: Chaitanya Publishing house.

Horne Van, C. James. 2001. *Financial Management and Policy*. New Delhi: Prentice Hall.

Endnotes

1. Hastie, K. L., One Businessman's View of Capital Budgeting, *Financial Management*, 3 (Winter 1974), pp. 36, 196.
2. Haynes, W.W. and Solomon, M.B., A Misplaced Emphasis in Capital Budgeting, *Quarterly Review of Economics and Business*, (Jan.-Feb. 1964), pp. 95–106.
3. King, P., Is the Emphasis of Capital Budgeting Theory Misplaced? *Journal of Business Finance and Accounting*, (Spring 1975), pp. 69–82.
4. Rockley, L.E., *Investment for Profitability*, Business Books, 1973.
5. Petty, J.W., and Scott, D.F., Capital Budgeting Practices in large US Firms: A Retrospective Analysis and Update, in Derkindem and Crum (Ed.), *Readings in Strategy for Corporate Investments*, Pitman, 1981.
6. Rockley, *op. cit.*
7. Schall, L.D., Sundem, G.L. and Geijsbeak, W.R., "Survey and Analysis of Capital Budgeting Methods", *Journal of Finance*, (March 1978), pp. 281–87.
8. Rockley, *op. cit.*
9. Pike, R.H., "Capital Budgeting Survey: An Update", Bradford University Discussion Paper, 1992.
10. Pandey, I.M., "Financing Decision: A Survey of Management Understanding", *Management Review: Economic & Political Weekly*, (Feb. 1984), pp. 27–31.
11. Petty and Scott, *op. cit.*
12. Rockley, *op. cit.*
13. Schall et al., *op. cit.*
14. Petty and Scott, *op. cit.*
15. Rockley, *op. cit.*
16. Hastie, *op. cit.*
17. We assume straight-line depreciation.
18. See Quirin, G.D., *The Capital Expenditure Decision*, Richard D. Irwin, 1977, p. 33.
19. Weston, J.F. and Brigham, E.F., *Managerial Finance*, Holt, Rinehart & Winston, 1972, p. 145.
20. Quirin, *op. cit.*, pp. 31–32.
21. See Porterfield, J.T.S., *Investment Decisions and Capital Costs*, Prentice-Hall, 1965, p. 22.

22. Gordon, Myron, "Payoff Period and Rate of Profit", *Journal of Business*, XXVIII, No. 4, pp. 253–60.
23. In fact, the optimal cut-off for the payback can be computed from the present value of an

annuity formula: Optimal cutoff = $\frac{C_0}{C} = \left[\frac{1}{r} - \frac{1}{r(1+r)^n} \right]$.

24. Bierman, H. and Smidt, S., *The Capital Budgeting Decision*, Macmillan, 1975, p. 73.
25. Bierman and Smidt, *op. cit.*, p. 31.
26. The use of IRR for appraising capital investment was emphasised in the formal terms, for the first time, by Joel Dean. See, Dean, Joel, *Capital Budgeting*, Columbia University Press, 1951, and his article, "Measuring the Productivity of Capital in Solomon", E. (Ed.), *The Management of Corporate Capital*.
27. Brealey, R. and Myers, S., *Principles of Corporate Finance*, McGraw Hill, 1991, p. 8.
28. Copeland, T.E. and Weston, J.F., *Financial Theory and Corporate Policy*, Addison-Wesley, 1983, p. 32.

NOTES

UNIT 6 ANALYSIS AND INTERPRETATION OF LEVERAGE

NOTES

Structure

- 6.0 Introduction
- 6.1 Unit Objectives
- 6.2 Financial Leverage
 - 6.2.1 Meaning of Financial Leverage
 - 6.2.2 Measures of Financial Leverage
- 6.3 Financial Leverage and the Shareholders' Return
- 6.4 Combining Financial and Operating Leverages
 - 6.4.1 Composite Leverage: Combined Effect of Operating and Financial Leverages
- 6.5 Financial Leverage and the Shareholders' Risk
- 6.6 Summary
- 6.7 Key Terms
- 6.8 Answers to 'Check your Progress'
- 6.9 Questions and Exercises
- 6.10 Further Reading

6.0 INTRODUCTION

Given the capital budgeting decision of a firm, it has to decide the way in which the capital projects will be financed. Every time the firm makes an investment decision, it is at the same time making a financing decision also. For example, a decision to build a new plant or to buy a new machine implies specific way of financing that project. Should a firm employ equity or debt or both? What are implications of the debt-equity mix? What is an appropriate mix of debt and equity?

6.1 UNIT OBJECTIVES

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

- Explain the concept of financial leverage
- Discuss the relationship between financial leverage and shareholder's return
- Analyse the combined effect of financial and operating leverages
- Understand the relationship between financial leverage and shareholder's risk

6.2 FINANCIAL LEVERAGE

The assets of a company can be financed either by increasing the owner claims or the creditor claims. The owner claims increase when the firm raises funds by issuing ordinary shares or by retaining the earnings; the creditors' claims increase by borrowing. The various means of financing represent the financial structure of an enterprise. The left-hand side of the balance sheet (liabilities plus equity) represents the financial structure

NOTES

of a company.¹ Traditionally, short-term borrowings are excluded from the list of methods of financing the firm's capital expenditure, and therefore, the long-term claims are said to form the capital structure of the enterprise. The term, **capital structure**, is used to represent the proportionate relationship between debt and equity. Equity includes paid-up share capital, share premium and reserves and surplus (retained earnings).

The financing or capital structure decision is a significant managerial decision. As discussed later in this chapter, it influences the shareholder's return and risk. Consequently, the market value of the share may be affected by the capital structure decision. The company will have to plan its capital structure initially, at the time of its promotion. Subsequently, whenever funds have to be raised to finance investments, a capital structure decision is involved. The process of the capital structure decision is shown in Figure 6.1. 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. This decision will involve an analysis of the existing capital structure and the factors, which will govern the decision at present. The dividend decision, as discussed later on, is, in a way, a financing decision. The company's policy to retain or distribute earnings affects the owners' claims. Shareholder equity position is strengthened by retention of earnings. Thus, the dividend decision has a bearing on the capital structure of the company. The new financing decision of the company may affect its debt-equity mix. The debt-equity mix has implications for the shareholders' earnings and risk, which in turn, will affect the cost of capital and the market value of the firm.

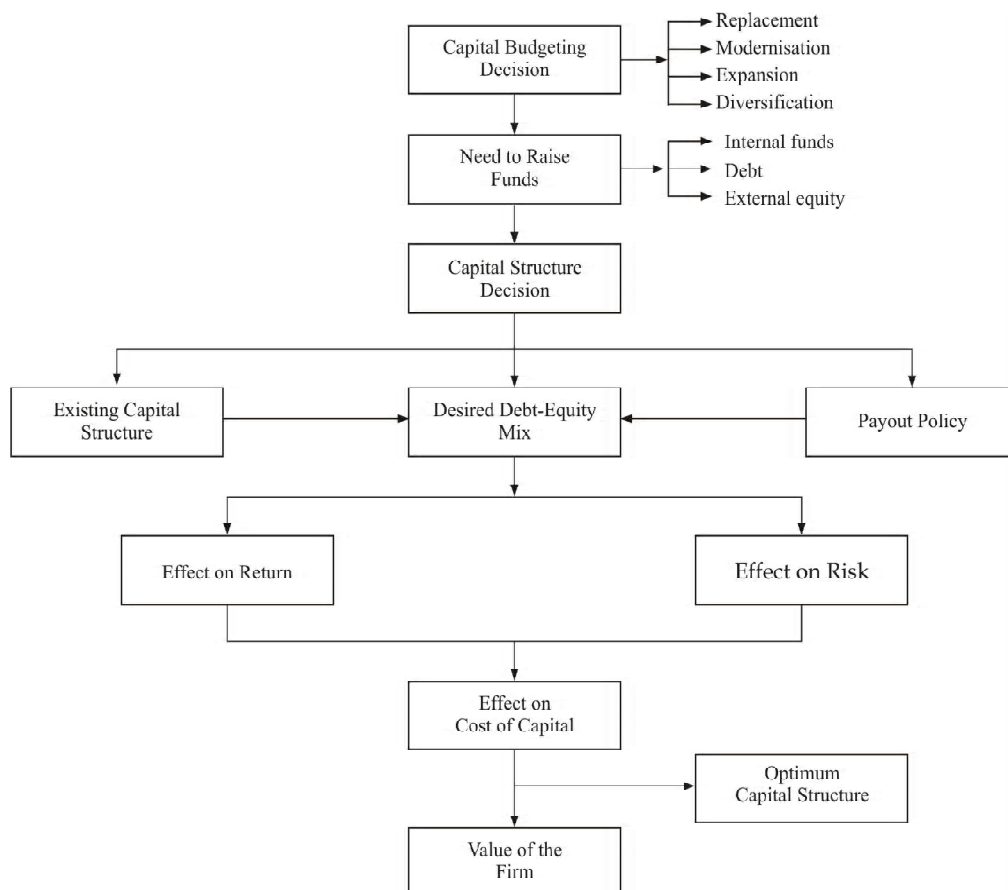


Fig. 6.1 The Capital Structure Decision Process

The management of a company should seek answers to the following questions while making the financing decision:

- How should the investment project be financed?
- Does the way in which the investment projects are financed matter?
- How does financing affect the shareholders' risk, return and value?
- Does there exist an optimum financing mix in terms of the maximum value to the firm's shareholders?
- Can the optimum financing mix be determined in practice for a company?
- What factors in practice should a company consider in designing its financing policy?

We will provide answers to these questions in this and next two chapters.

6.2.1 Meaning of Financial Leverage

As stated earlier, a company can finance its investments by debt and equity. The company may also use preference capital. The rate of interest on debt is fixed irrespective of the company's rate of return on assets. The company has a legal binding to pay interest on debt. The rate of preference dividend is also fixed; but preference dividends are paid when the company earns profits. The ordinary shareholders are entitled to the residual income. That is, earnings after interest and taxes (less preference dividends) belong to them. The rate of the equity dividend is not fixed and depends on the dividend policy of a company.

The use of the fixed-charges sources of funds, such as debt and preference capital along with the owners' equity in the capital structure, is described as **financial leverage** or **gearing** or **trading on equity**. The use of the term trading on equity is derived from the fact that it is the owner's equity that is used as a basis to raise debt; that is, the equity that is traded upon. The supplier of debt has limited participation in the company's profits and, therefore, he will insist on protection in earnings and protection in values represented by ownership equity.²

The financial leverage employed by a company is intended to earn more return on the fixed-charge funds than their costs. The surplus (or deficit) will increase (or decrease) the return on the owners' equity. The rate of return on the owners' equity is levered above or below the rate of return on total assets. For example, if a company borrows ₹ 100 at 8 per cent interest (that is, ₹ 8 per annum) and invests it to earn 12 per cent return (that is, ₹ 12 per annum), the balance of 4 per cent (₹ 4 per annum) after payment of interest will belong to the shareholders, and it constitutes the profit from financial leverage. On the other hand, if the company could earn only a return of 6 per cent on ₹ 100 (₹ 6 per annum), the loss to the shareholders would be ₹ 2 per annum. Thus, financial leverage provides the potentials of increasing the shareholders' earnings as well as creating the risks of loss to them. It is a double-edged sword. The following statement very well summarizes the concept of financial leverage:³

This role of financial leverage suggests a lesson in physics, and there might be some point in considering the rate of interest paid as the fulcrum used in applying forces through leverage. At least it suggests consideration of pertinent variables; the lower the interest rate, the greater will be the profit, and the less the chance of loss; the less the amount borrowed the lower will be the profit or loss; also, the greater the borrowing, the greater the risk of unprofitable leverage and the greater the chance of gain.

NOTES

6.2.2 Measures of Financial Leverage

The most commonly used measures of financial leverage are:⁴

1. **Debt ratio:** The ratio of debt to total capital, i.e.,

$$L_1 = \frac{D}{D+E} = \frac{D}{V}$$

where D is value of debt, E is value of shareholders' equity and V is value of total capital (i.e., $D + E$). D and E may be measured in terms of book value. The book value of equity is called net worth. Shareholder's equity may be measured in terms of market value.

2. **Debt–equity ratio:** The ratio of debt to equity, i.e.,

$$L_2 = \frac{D}{E} \quad (1)$$

3. **Interest coverage:** The ratio of net operating income (or EBIT) to interest charges, i.e.,⁵

$$L_3 = \frac{\text{EBIT}}{\text{Interest}} \quad (2)$$

The first two measures of financial leverage can be expressed either in terms of book values or market values. The market value to financial leverage is theoretically more appropriate because market values reflect the current attitude of investors. But it is difficult to get reliable information on market values in practice. The market values of securities fluctuate quite frequently.

There is no difference between the first two measures of financial leverage in operational terms. They are related to each other in the following manner.⁶

$$L_1 = \frac{L_2}{1 + L_2} = \frac{D/E}{1 + D/E} = \frac{D}{V} \quad (3)$$

$$L_2 = \frac{L_1}{1 - L_1} = \frac{D/V}{1 - D/V} = \frac{D}{E} \quad (4)$$

These relationships indicate that both these measures of financial leverage will rank companies in the same order. However, the first measure (i.e. D/V) is more specific as its value will range between zero to one. The value of the second measure (i.e. D/E) may vary from zero to any large number. The debt–equity ratio, as a measure of financial leverage, is more popular in practice. There is usually an accepted industry standard to which the company's debt–equity ratio is compared. The company will be considered risky if its debt–equity ratio exceeds the industry standard. Financial institutions and banks in India also focus on debt–equity ratio in their lending decisions.

The first two measures of financial leverage are also measures of **capital gearing**. They are static in nature as they show the borrowing position of the company at a point of time. These measures, thus, fail to reflect the level of financial risk, which is inherent in the possible failure of the company to pay interest and repay debt.

The third measure of financial leverage, commonly known as **coverage ratio**, indicates the capacity of the company to meet fixed financial charges. The reciprocal of interest coverage, that is, interest divided by EBIT, is a measure of the firm's **income gearing**. Again, by comparing the company's coverage ratio with an accepted industry

NOTES

NOTES

standard, investors can get an idea of financial risk. However, this measure suffers from certain limitations.⁷ First, to determine the company's ability to meet fixed financial obligations, it is the cash flow information, which is relevant, not the reported earnings. During recessionary economic conditions, there can be wide disparity between the earnings and the net cash flows generated from operations. Second, this ratio, when calculated on past earnings, does not provide any guide regarding the future riskiness of the company. Third, it is only a measure of short-term liquidity rather than of leverage.

Financial Leverage of Companies in India

How much financial leverage do Indian companies employ? Companies differ in the use of financial leverage since it depends on a number of factors such as the size, nature of product, capital intensity, technology, market conditions, management attitude etc. In Table 6.1, we provide the measures of financial leverage for a few large companies in India for the financial year 2008. As you may observe, companies show wide variations in the use of financial leverage. Banks or finance companies employ very high amount of debt. Housing Development Finance Corporation has the highest debt ratio of 91 per cent and its debt-equity ratio is 10:1. Infosys does not use any debt. Amongst manufacturing companies, Ranbaxy has the highest debt ratio followed by Tata Steel, Reliance Energy and Tata Motors. In spite of high debt, these companies have sufficient interest coverage due to their high profitability.

Table 6.1 Financial Leverage of Large Indian Companies, 2008

Company	Balance Sheet Gearing		Income Gearing	
	Debt ratio	Debt-equity ratio	Interest coverage	Interest to EBIT ratio
Bajaj Auto	0.223	0.288	321.569	0.003
BHEL	0.010	0.010	87.305	0.011
Bharti Airtel	0.291	0.410	17.772	0.056
Cipla	0.035	0.036	73.400	0.014
Dr. Reddy's	0.069	0.074	28.059	0.036
Grasim Industries	0.320	0.472	33.754	0.030
HDFC Bank	0.487	0.948	1.515	0.660
Hindalco Industries	0.371	0.589	15.787	0.063
HUL	0.025	0.025	203.926	0.005
Housing Dev. Fin. Corp.	0.910	10.078	1.536	0.651
ICICI Bank	0.741	2.865	1.223	0.818
ITC	0.018	0.019	245.400	0.004
Infosys	0.000	0.000	-	-
L&T	0.264	0.358	7.068	0.141
Mahindra	0.305	0.439	73.627	0.014
Maruti Suzuki India	0.095	0.106	61.777	0.016
NTPC	0.332	0.498	5.337	0.187
ONGC	0.006	0.006	7.544	0.133

NOTES

Ranbaxy	0.560	1.273	8.502	0.118
Reliance Comm.	0.415	0.710	8.562	0.117
Reliance Energy	0.385	0.627	3.976	0.252
Reliance Industries	0.302	0.432	12.185	0.082
Satyam	0.002	0.002	207.732	0.005
SBI	0.641	1.785	1.324	0.755
TCS	0.006	0.006	1216.067	0.001
Tata Motors	0.365	0.574	6.834	0.146
Tata Steel	0.404	0.679	25.698	0.039
Wipro	0.025	0.025	442.139	0.002

* Source: CMIE database.

6.3 FINANCIAL LEVERAGE AND THE SHAREHOLDERS' RETURN

The primary motive of a company in using financial leverage is to magnify the shareholders' return under favourable economic conditions. The role of financial leverage in magnifying the return of the shareholders is based on the assumptions that the fixed-charges funds (such as the loan from financial institutions and banks or debentures) can be obtained at a cost lower than the firm's rate of return on net assets (RONA or ROI). Thus, when the difference between the earnings generated by assets financed by the fixed-charges funds and costs of these funds is distributed to the shareholders, the earnings per share (EPS) or return on equity (ROE) increases. However, EPS or ROE will fall if the company obtains the fixed-charges funds at a cost higher than the rate of return on the firm's assets. It should, therefore, be clear that EPS, ROE and ROI are the important figures for analyzing the impact of financial leverage.

EPS and ROE Calculations

EPS is calculated by dividing profit after taxes, PAT also called net income, NI, by the number of shares outstanding. PAT is found out in two steps. First, the interest on debt, INT, is deducted from the earnings before interest and taxes, EBIT, to obtain the profit before taxes, PBT. Then, taxes are computed on and subtracted from PBT to arrive at the figure of PAT. The formula for calculating EPS is as follows:⁸

$$\text{Earnings per share} = \frac{\text{Profit after tax}}{\text{Number of shares}}$$

$$\text{EPS} = \frac{\text{PAT}}{N} = \frac{(\text{EBIT} - \text{INT})(1 - T)}{N} \quad (5)$$

where T is the corporate tax rate and N is the number of ordinary shares outstanding. If the firm does not employ any debt, then the formula is:

$$\text{EPS} = \frac{\text{EBIT}(1 - T)}{N} \quad (6)$$

ROE is obtained by dividing PAT by equity (E). Thus, the formula for calculating ROE is as follows:⁹

Check Your Progress

1. Define capital structure.
2. What is financial leverage?
3. What does the third measure of financial leverage indicate?

$$\text{Return on equity} = \frac{\text{Profit after tax}}{\text{Value of equity}}$$

$$\text{ROE} = \frac{(\text{EBIT} - \text{INT})(1 - T)}{E} \quad (7)$$

For calculating ROE either the book value or the market value equity may be used.

How does the financial leverage affect EPS and ROE? We shall describe two situations to illustrate the impact of the financial leverage on EPS and ROE. First, we shall analyze the impact of the alternative financial plans on EPS and ROE assuming that EBIT is constant. Second, we shall assume that EBIT varies and shows the effect of the alternative financial plans on EPS and ROE under the conditions of varying EBIT.

Analyzing Alternative Financial Plans: Constant EBIT

Suppose a new firm, Brightways Ltd, is being formed. The management of the firm is expecting a before-tax rate of return of 24 per cent on the estimated total investment of ₹ 500,000. This implies $\text{EBIT} = ₹ 500,000 \times 0.24 = ₹ 120,000$. The firm is considering two alternative financial plans: (i) either to raise the entire funds by issuing 50,000 ordinary shares at ₹ 10 per share, or (ii) to raise ₹ 250,000 by issuing 25,000 ordinary shares at ₹ 10 per share and borrow ₹ 250,000 at 15 per cent rate of interest. The tax rate is 50 per cent. What are the effects of the alternative plans for the shareholders' earnings? Table 6.2 shows calculations.

Table 6.2 Effect of Financial Plan on EPS and ROE: Constant EBIT

	Financial Plan	
	Debt-equity (₹)	All-equity (₹)
1. Earnings before interest and taxes, EBIT	120,000	120,000
2. Less: Interest, INT	0	37,500
3. Profit before taxes, PBT = EBIT – INT	120,000	82,500
4. Less: Taxes = $T(\text{EBIT} - \text{INT})$	60,000	41,250
5. Profit after taxes, PAT = $(\text{EBIT} - \text{INT})(1 - T)$	60,000	41,250
6. Total earnings of investors, PAT + INT	60,000	78,750
7. Number of ordinary shares, N	50,000	25,000
8. $\text{EPS} = (\text{EBIT} - \text{INT})(1 - T)/N$	1.20	1.65
9. $\text{ROE} = (\text{EBIT} - \text{INT})(1 - T)/E$	12.0%	16.5%

From Table 6.2, we see that the impact of the financial leverage is quite significant when 50 per cent debt (debt of ₹ 250,000 to total capital of ₹ 500,000) is used to finance the investment. The firm earns ₹ 1.65 per share, which is 37.5 per cent more than ₹ 1.20 per share earned with no leverage. ROE is also greater by the same percentage.

Table 6.3 Gain from Financial Leverage

	₹
1. EBIT on assets financed by debt, $₹ 250,000 \times 0.24$	60,000
2. Less: Interest, $₹ 250,000 \times 0.15$	37,500
3. Surplus earnings to the shareholders, $₹ 250,000 \times (0.24 - 0.15)$	22,500
4. Less: Taxes at 50 per cent	11,250
5. After tax surplus earnings accruing to the shareholders (leverage gain)	11,250

NOTES

EPS is greater under the debt-equity plan for two reasons. First, under this plan, the firm is able to borrow half of its funds requirements at a cost (15 per cent) lower than its rate of return on total investment (24 per cent). Thus, it pays a 15 per cent (or 7.5 per cent after tax) interest on the debt of ₹ 250,000 while earns a return of 24 per cent (or 12 per cent after tax) by investing this amount. The difference of 9 per cent (or 4.5 per cent after tax) accrues to the shareholders as owners of the firm without any corresponding investment. The difference in terms of rupees is ₹ 22,500 before taxes and ₹ 11,250 after taxes. Thus, the gain from the financial leverage is as shown in Table 6.3.

Second, under the debt-equity plan, the firm has only 25,000 shares as against 50,000 shares under the all-equity plan. Consequently, the after-tax favourable leverage of ₹ 11,250 dividend by 25,000 shares increases EPS by Re 0.45 from ₹ 1.20 to ₹ 1.65.

Interest Tax Shield

Another important way of explaining the effect of debt is to see the impact of the interest charges on the firm's tax liability. The interest charges are tax deductible and, therefore, provide tax shield, which increases the earnings of the shareholders. See line 6 in Table 6.2 that compares the total earnings of all investors (shareholders as well debt holders) under two alternative financial plans. The total earnings are more by ₹ 18,750 under the debt-equity plan that is exactly the amount of tax saved (i.e. ₹ 60,000 – ₹ 41,250), on account of the tax deductibility of the interest charges. The **interest tax shield** under the second financial plan could be directly found out as:

$$\begin{aligned}\text{Interest tax shield} &= \text{Tax rate} \times \text{Interest} \\ &= 0.5 \times 37,500 = \text{Rs } 18,750\end{aligned}$$

It is the fact of the tax deductibility of the interest charges, which makes the use of the debt in the capital structure beneficial to a firm.

Instead of following the long procedure discussed in Table 6.2, Equation 5 or 7 can be used to examine the effect of the alternative financial plans on the shareholders' return. Suppose that the management of the firm in the example is considering a third alternative. They want to use 75 per cent debt and 25 per cent equity to finance the assets. Under this financial plan, for raising equity investment of ₹ 125,000, the firm will sell 12,500 shares and pay ₹ 56,250 interest on a debt of ₹ 375,000 at 15 per cent. EPS and ROE will be as follows:

$$\begin{aligned}\text{EPS} &= \frac{(\text{EBIT} - \text{INT})(1 - T)}{N} \\ &= \frac{(120,000 - 56,250)(1 - 0.50)}{12,500} = \frac{31,875}{12,500} \\ &= \text{Rs } 2.55 \\ \text{ROE} &= \frac{(\text{EBIT} - \text{INT})(1 - T)}{E} = \frac{31,875}{125,000} = 25.5\%\end{aligned}$$

Under the third alternative financial plan of 75 per cent debt, EPS and ROE are more than double as compared with all-equity, no-leverage financial plan.

In the example, we assume that the firm earns EBIT of 24 per cent on its investment (or ₹ 500,000 × 0.24 = ₹ 120,000). Since the firm pays 15 per cent on debt and earns more (24 per cent) on these funds, the effect of leverage is favourable. The more debt

NOTES

the firm uses, the greater is the EPS or ROE. The 24 per cent overall return is an *expected* figure. Suppose that, for some reason, the firm may not be able to earn 24 per cent before-tax return on its total capital, rather it can earn only 12 per cent return (i.e., EBIT = ₹ 60,000). What would be the impact on EPS and ROE? We can use Equations 5 and 7 to calculate EPS and ROE:

No debt plan

$$\text{EPS} = \frac{(60,000 - 0)(1 - 0.5)}{50,000} = \frac{30,000}{50,000} = \text{Re } 0.60$$

$$\text{ROE} = \frac{30,000}{500,000} = 6\%$$

50% debt plan

$$\text{EPS} = \frac{(60,000 - 37,500)(1 - 0.5)}{25,000} = \frac{11,250}{25,000} = \text{Re } 0.45$$

$$\text{ROE} = \frac{11,250}{250,000} = 4.5\%$$

75% debt plan

$$\text{EPS} = \frac{(60,000 - 56,250)(1 - 0.5)}{12,500} = \frac{1,875}{12,500} = \text{Re } 0.15$$

$$\text{ROE} = \frac{1,875}{125,000} = 1.5\%$$

We can see from the calculations above that the effect of financial leverage is unfavourable. EPS and ROE decline as more debt is used. Why is the effect of financial leverage unfavourable? It is unfavourable because the firm's rate of return on total funds or assets is less than the cost of debt. The firm is paying 15 per cent on debt and earning a return of 12 per cent on funds employed. The shareholders will have to meet the deficit of 3 per cent. As a result, EPS and ROE decline. If the rate of return on assets were just equal to the cost of debt, it can be seen that financial leverage will have no impact on the shareholders' return. EPS and ROE would be the same under all plans. We are thus led to an important conclusion: *The financial leverage will have a favourable impact on EPS and ROE only when the firm's return on investment (ROI) exceeds the interest cost of debt (i). The impact will be unfavourable if the return on investment is less than the interest cost.* It is in this sense that the financial leverage is said to be a double-edged sword.

Effect of Leverage on ROE and EPS

Favourable	$ROI > i$
Unfavourable	$ROI < i$
Neutral	$ROI = i$

These conclusions become very clear if we rewrite the formula for ROE. Suppose r is the before-tax return on assets or investment i.e. EBIT divided by $V = E + D$, and i is the interest rate on debt. Equation 7 can be written as follows:

NOTES

$$\text{ROE} = \frac{(rV - iD)(1 - T)}{E} = \frac{[r(E + D) - iD](1 - T)}{E}$$

$$\text{ROE} = \left[r + (r - i) \frac{D}{E} \right] (1 - T) \quad (8)$$

For an all-equity capital structure firm, D/E will be zero. Therefore, ROE for such firm is simply the after-tax return on assets:

$$\text{ROE} = r(1 - T) \quad (9)$$

A comparison of Equations (8) and (9) clearly shows that ROE is more by $[(r - i) D/E] (1 - T)$ factor when the firm uses debt. It is also indicated that if the return on assets exceeds the interest rate ($r > i$), ROE will increase linearly with increase in the financial leverage (viz., D/E). The effect of leverage will depend on both D/E and the spread between the rate of return on assets (r) and interest cost (i). If the return on assets equals the interest rate ($r = i$), no benefit of the financial leverage will be obtained; that is, $(r - i) D/E (1 - T) = 0$. The leverage effect will be unfavourable when the return on assets is less than the interest rate (when $r < i$, then $(r - i) D/E (1 - T)$, would become negative). Equation (8) also shows that for a given level of financial leverage with the interest rate and tax rate being constant, ROE will increase or decline with the increase or decline in the rates of return on assets. The following section illustrates the behaviour of EPS with varying EBIT.

Analyzing Alternative Financial Plans: Varying EBIT

In the previous example, we assumed EBIT as constant. In practice, EBIT for any firm is subject to various influences. For example, because of the fluctuations in the economic conditions, sales of a firm change and as a result, EBIT also varies. In a given period, the actual EBIT of the firm may be more or less than anticipated. It is therefore useful to analyze the impact of the financial leverage on EPS (and ROE) for possible fluctuations in EBIT (or r).

EBIT–EPS analysis: Suppose that Brightways Ltd may face any of the four possible economic conditions: very poor, poor, normal and good. The firm may have a 5 per cent chance of performing very poorly and earning a negative 5 per cent return on its total assets [$\text{EBIT} = (-0.05) \times ₹ 500,000 = -₹ 25,000$]. If the economic condition is neither very poor nor normal, the firm may be able to manage a return of 10 or 15 per cent. It may have 10 per cent chance of earning 10 per cent return ($\text{EBIT} = ₹ 50,000$). Under normal economic conditions, the firm has a 35 per cent chance of earning 24 per cent return ($\text{EBIT} = ₹ 120,000$) and a 30 per cent chance of earning 32 per cent return ($\text{EBIT} = ₹ 160,000$). If the economic conditions are really favourable, the firm can earn as high as 60 per cent return ($\text{EBIT} = ₹ 300,000$). But there is only 5 per cent possibility that the economic conditions will prove to be so good. Brightways' possible levels of sales and operating expenses with their probability of occurrence are given in Table 6.4.

Table 6.4 Expected Sales, EBIT, ROI with Associated Probabilities

(₹ '000)						
	Economic Conditions					
	Very poor	Poor		Normal	Good	
Probability	0.05	0.10	0.15	0.35	0.30	0.05
Sales (₹)	510	660	710	800	880	1,160

NOTES

Costs:

Variable (₹)	255	330	355	400	440	580
Fixed (₹)	280	280	280	280	280	280
Total Costs (₹)	535	610	635	680	720	860
EBIT (₹)	– 25	50	75	120	160	300
ROI (<i>r</i>)	– 5%	10%	15%	24%	32%	60%

The behaviour of EPS (and ROE) with fluctuating EBIT (or return on assets) under the alternative financial plans is analyzed in Table 6.5. The summary of the effect of the increasing financial leverage on EPS with changing EBIT (see Tables 6.6 and 6.7) provides interesting insights.

Table 6.5 Impact of Financial Leverage: Varying EBIT

(₹' 000)

	Economic Conditions					
	Very poor	Poor	Normal	Good		
Plan I: No debt						
EBIT	– 25.00	50.00	75.00	120.00	160.00	300.00
Less: Interest	0.00	0.00	0.00	0.00	0.00	0.00
PBT	– 25.00	50.00	75.00	120.00	160.00	300.00
Less:						
Tax, 50%	–12.50*	25.00	37.50	60.00	80.00	150.00
PAT	– 12.50	25.00	37.50	60.00	80.00	150.00
No. of shares ('000)	50.00	50.00	50.00	50.00	50.00	50.00
EPS (₹)	– 0.25	0.50	0.75	1.20	1.60	3.00
ROE (%)	– 2.50	5.00	7.50	12.00	16.00	30.00
Plan II: 25% debt						
EBIT	– 25.00	50.00	75.00	120.00	160.00	300.00
Less:						
Interest	18.75	18.75	18.75	18.75	18.75	18.75
PBT	– 43.75	31.25	56.25	101.25	141.25	281.25
Less:						
Tax, 50%	– 21.88*	15.63	28.13	50.63	70.63	140.63
PAT	– 21.87	15.62	28.12	50.62	70.62	140.62
No. of shares ('000)	37.50	37.50	37.50	37.50	37.50	37.50
EPS (₹)	– 0.58	0.42	0.75	1.35	1.88	3.75
ROE (%)	– 5.80	4.20	7.50	13.50	18.80	37.50
Plan III: 50% debt						
EBIT	– 25.00	50.00	75.00	120.00	160.00	300.00
Less:						
Interest	37.50	37.50	37.50	37.50	37.50	37.50
PBT	– 62.50	12.50	37.50	82.50	122.50	262.50
Less:						
Tax, 50%	– 31.25*	6.25	18.75	41.25	61.25	131.25
PAT	– 31.25	6.25	18.75	41.25	61.25	131.25
No. of shares ('000)	25.00	25.00	25.00	25.00	25.00	25.00
EPS (₹)	– 1.25	0.25	0.75	1.65	2.45	5.25
ROE (%)	– 12.50	2.50	7.50	16.50	24.50	52.50

NOTES

Plan IV: 75% debt

EBIT	– 25.00	50.00	75.00	120.00	160.00	300.00
Less:						
Interest	56.25	56.25	56.25	56.25	56.25	56.25
PBT	– 81.25	– 6.25	18.75	63.75	103.75	243.75
Less:	– 40.63*	– 3.13	9.38	31.88	51.88	121.88
Tax, 60%						
PAT	– 40.62	– 3.12	9.37	31.87	51.87	121.87
No. of shares ('000)	12.50	12.50	12.50	12.50	12.50	12.50
EPS (₹)	– 3.25	– 0.25	0.75	2.55	4.15	9.75
ROE (%)	– 32.50	– 2.50	7.50	25.50	41.50	97.50

* It is assumed that losses will be set off against other profits or tax credit will be available to the firm.

Financial Plan I does not employ any leverage. As EBIT increases, EPS also increases. In fact, EPS increases with improved EBIT under all financial plans (Table 6.6). What is important to note is that as the financial leverage is increased, EPS is further magnified. Take the example of normal and good years. When EBIT increases from ₹ 120,000 to ₹ 160,000—an increase by 33 per cent, EPS under no financial leverage plan increases proportionately (i.e., by 33 per cent). But EPS increases faster under the high financial leverage plans; it increases by 40 per cent when debt is 25 per cent, by 48 per cent when debt is 50 per cent and by 63 per cent when debt is 75 per cent. Same conclusions can be drawn from Table 6.7 for the behaviour of ROE in relation to return on assets (r). It may be worth repeating that the favourable effect of the increasing financial leverage during normal and good years is on account of the fact that the rates of return on assets (investment) exceed the cost on debt.

Financial leverage works both ways. It accelerates EPS (and ROE) under favourable economic conditions, but depresses EPS (and ROE) when the proceedings are not good for the firm. It can be seen from Tables 6.6 and 6.7 that EPS or ROE is lower with debt in the capital structure in the poor years. With no leverage plan, if the firm's return on assets is positive, although low, the shareholders do obtain positive EPS or ROE. For example, when the firm's return (r) is 10 per cent, EPS under no leverage plan is Re 0.40 (or ROE is 4 per cent). But it becomes lower with more debt used, and even turns negative under very high leverage plan, such as Financial Plan IV. The unfavourable effect on EPS (and ROE) is more severe with more debt in the capital structure when EBIT (or r) is negative.

Table 6.6 Summary of the Behaviour of EPS with Fluctuating EBIT under Alternative Financial Plans

Economic Conditions	EBIT	Financial Plan			
		No debt I EPS	25% debt II EPS	50% debt III EPS	75% debt IV EPS
Very poor	– 25,000	– 0.25	– 0.58	– 1.25	– 3.25
Poor	50,000	0.50	0.42	0.25	– 0.25
	75,000	0.75	0.75	0.75	0.75
Normal	1,20,000	1.20	1.35	1.65	2.55
	1,60,000	1.60	1.88	2.45	4.15
Good	3,00,000	3.00	3.75	5.25	9.75

Table 6.7 Summary of the Behaviour of ROE with Fluctuating Return on Assets under Alternative Financial Plans

Economic Conditions	Return on assets	Financial Plan			
		No debt I	25% debt II	50% debt III	75% debt IV
Very poor	– 5%	– 2.5%	– 5.8%	– 12.5%	– 32.5%
Poor	10%	5.0%	4.2%	2.5%	– 2.5%
	15%	7.5%	7.5%	7.5%	7.5%
Normal	24%	12.0%	13.5%	16.5%	25.5%
	32%	16.0%	18.8%	24.5%	41.5%
Good	60%	30.0%	37.5%	52.5%	97.5%

NOTES

The reason again lies in the relationship between the return on assets and the cost of debt. If the cost of debt were more than the return on assets, EPS (or ROE) would depress with more leverage. It is indicated from Table 6.6 or Table 6.7 that when the firm earns 15 per cent return on its assets, which is equal to the cost of debt, EPS (or ROE) is the same under all financial plans. Whatever the firm earns on the funds raised through debt is exactly paid to the suppliers of debt as interest charges.

Variability of EPS: Yet another significant point to be noted from Table 6.6 is that the higher the financial leverage, the wider the range over which EPS varies with fluctuating EBIT. For example, when no debt is used (Financial Plan I), EPS ranges between a negative ₹ 0.25 to a positive ₹ 3.00—a range of ₹ 3.25. Under Financial Plan II, where 25 per cent debt is introduced in the capital structure, EPS ranges from a negative ₹ 0.58 to a positive ₹ 3.75—a range of ₹ 4.33. The range of EPS increases to ₹ 6.50 and ₹ 13.00 when debt is respectively 50 per cent and 75 per cent. The range for ROE shows the similar behaviour (Table 6.7). Thus, for any given level of variability in EBIT (or r), the increased financial leverage increases the degree of variability in EPS (or ROE). The indiscriminate use of financial leverage without taking into account the uncertainty surrounding EBIT (or r) can lead a firm into financial difficulties. More about the risk of the financial leverage is explained in the next section.

EBIT–EPS chart: One convenient and useful way of showing the relationship between EBIT and EPS for the alternative financial plans is to prepare the EBIT–EPS chart. The chart is easy to prepare since, for any given level of financial leverage, EPS is linearly related to EBIT.¹⁰ As noted earlier, the formula for calculating EPS is:

$$\begin{aligned} \text{EPS} &= \frac{(\text{EBIT} - \text{INT})(1 - T)}{N} \\ &= \frac{(1 - T)}{N} [\text{EBIT} - \text{INT}] \end{aligned} \quad (10)$$

Equation (10) can also be written as follows:

$$\begin{aligned} \text{EPS} &= \frac{(1 - T)}{N} \text{EBIT} - \frac{(1 - T)}{N} \text{INT} \\ &= -\frac{(1 - T)}{N} \text{INT} + \frac{(1 - T)}{N} \text{EBIT} \end{aligned} \quad (11)$$

We assume that the level of debt, the cost of debt and the tax rate are constant. Therefore, in Equations (10) and (11), the terms $(1 - T)/N$ and INT (which is equal to

NOTES

interest rate times debt, iD) are constant; EPS will increase if EBIT increases and fall if EBIT declines.

Under the assumptions made, the first part of Equation (11) is a constant and can be represented by a . EBIT is a random variable since it can assume a value more or less than expected. The term $(1 - T)/N$ is also a constant and can be shown as b . Thus, the EPS formula can be rewritten as:

$$\text{EPS} = a + b \times \text{EBIT} \quad (12)$$

Equation (12) clearly indicates that EPS is a linear function of EBIT.

The EBIT–EPS analysis shown in Table 6.8 could be worked out with the help of Equation (12). As an illustration, we work out Equation (12) for Financial Plan IV: equity ₹ 125,000, 15 per cent debt ₹ 375,000, number of shares 12,500 and tax rate 50 per cent. The values of a and b ('000 eliminated) are:

$$a = -\frac{(1-T)}{N} \text{INT} = -\frac{0.5}{12.5} \times 56.25 = -2.25$$

$$b = \frac{(1-T)}{N} = \frac{0.5}{12.5} = 0.04$$

EPS for various levels of EBIT will be as shown in Table 6.8.

Table 6.8 EPS Calculations for Financial Plan IV: $\text{EPS} = a + b \text{ EBIT}$

$(1 - T)/N$ = b	EBIT	=	$b \text{ EBIT}$	+	a	=	$\text{EPS} = a + b$ $\times \text{EBIT}$
(0.04)	(- 25)	=	- 1.00	+	- 2.25	=	- 3.25
(0.04)	(50)	=	2.00	+	- 2.25	=	- 0.25
(0.04)	(75)	=	3.00	+	- 2.25	=	0.75
(0.04)	(120)	=	4.80	+	- 2.25	=	2.55
(0.04)	(160)	=	6.40	+	- 2.25	=	4.15
(0.04)	(300)	=	12.00	+	- 2.25	=	9.75

Because of the linear relation between EPS and EBIT, the EBIT–EPS chart can be drawn easily. We can use the following information of Financial Plans I and III in our example to draw EBIT–EPS chart in Figure 6.2.

EBIT (₹ '000)	EPS	
	No debt	50% debt
- 25,000	- 0.25	- 1.25
0	0.00	- 0.75
25,000	0.25	- 0.25
50,000	0.50	0.25
75,000	0.75	0.75
1,00,000	1.00	1.25
1,25,000	1.25	1.75
1,50,000	1.50	2.25
1,75,000	1.75	2.75
2,00,000	2.00	3.25

NOTES

In Figure 6.2, EBIT is shown on a horizontal line and EPS on a vertical line. If we identify any two points of EPS for two given levels of EBIT and join them in a straight line, we obtain EPS-line for a particular financial plan. For example, at EBIT of ₹ 50,000 and ₹ 75,000, two points of EPS are respectively Re 0.25 and Re 0.75 for Financial Plan III. If we join these two points in a straight line, we get EPS-line for Financial Plan III. The EPS-line can be similarly drawn for 100 per cent equity plan. We can see from Figure 6.2 that EPS-lines for all-equity and 50 per cent debt plans intersect at EBIT ₹ 75,000. EPS under both plans are same at this level of EBIT. Figure 6.3, drawn similarly as Figure 6.2, shows four financial plans together.

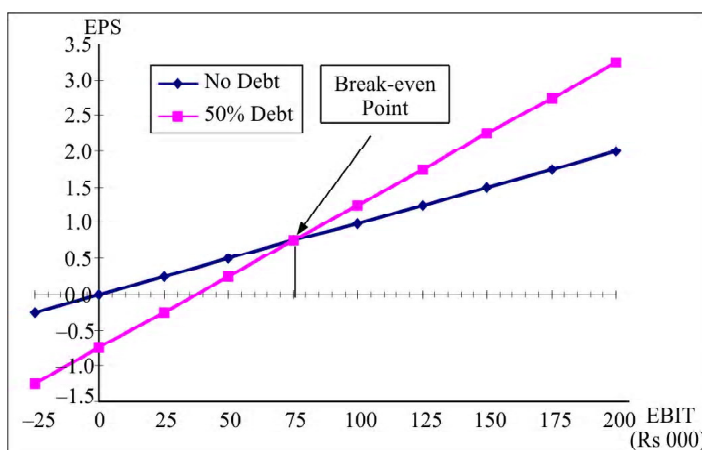


Fig. 6.2 EBIT–EPS chart

The steep solid lines in Figure 6.3 show the relation between EBIT and EPS. The line relating EBIT and EPS becomes steeper with more debt in the capital structure, and steeper the line, the more the profit potential to the shareholders with increasing EBIT. If EBIT is declining, the loss to the shareholders will be magnified. The point of intersection of four EBIT–EPS lines in Figure 6.3 indicates the **indifference point** or the **EBIT–EPS break-even point** at which EPS is same regardless of the level of the financial leverage. In the example (see Table 6.6), EPS is same for all financial plans when the firm earns a 15 per cent return on assets or EBIT of ₹ 75,000.

EBIT	EPS			
	No debt	25% debt	50% debt	75% debt
– 25,000	– 0.25	– 0.583	– 1.25	– 3.25
0	0.00	– 0.250	– 0.75	– 2.25
25,000	0.25	0.083	– 0.25	– 1.25
50,000	0.50	0.417	0.25	– 0.25
75,000	0.75	0.750	0.75	0.75
1,00,000	1.00	1.083	1.25	1.75
1,25,000	1.25	1.417	1.75	2.75
1,50,000	1.50	1.750	2.25	3.75
1,75,000	1.75	2.083	2.75	4.75
2,00,000	2.00	2.417	3.25	5.75

NOTES

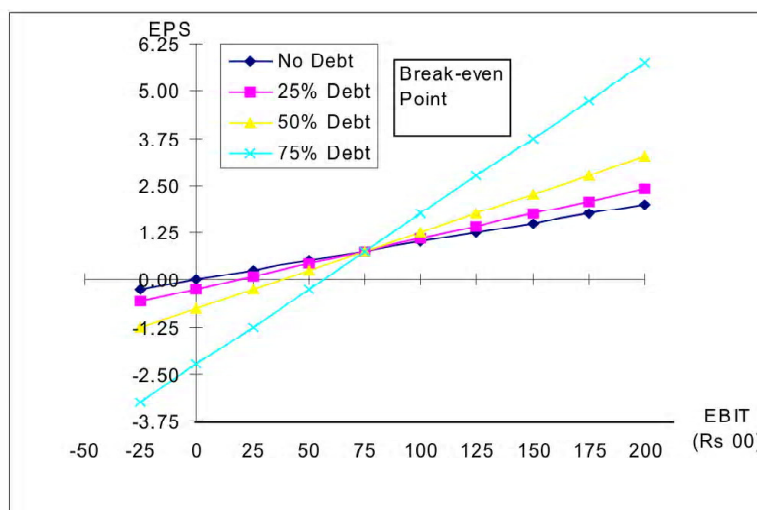


Fig. 6.3 EBIT–EPS chart

The 15 per cent return on assets is just equal to the cost of debt. It can also be noticed from Figure 6.3 that below the ‘indifference point’ the EBIT–EPS lines shift more towards the right when the level of financial leverage increases, indicating unfavourable effect because of a low rate of return on assets than the interest cost. The EBIT–EPS line shifts more towards the left beyond the ‘indifference point’ when the level of the financial leverage increases. This indicates a favourable effect of leverage because the return on assets exceeds the interest rate. We thus again reach the conclusion that the shareholders will benefit by the use of the financial leverage in terms of the increased EPS if return on assets is higher than the interest cost, and will have reduced EPS if return on assets is lower than the interest cost; the shareholders’ earnings will not be affected by the level of leverage if return on assets is just equal to the interest cost.

Calculation of indifference point: The break-even, or indifference, point between two alternative methods of financing can be determined by a formula. In the earlier example, suppose the firm is considering only two financial plans—an all-equity plan (Financial Plan I) and a 25 per cent debt and 75 per cent equity plan (Financial Plan II). The firm wants to know the level of EBIT at which EPS would be the same under both the plans. To find out the break-even level of EBIT, we may set the EPS formulae of two plans equal. The EPS formula under **all-equity plan** is

$$EPS = \frac{(1 - T) EBIT}{N_1}$$

where N_1 is number of ordinary shares under first plan and since the firm has no debt, no interest charges exist. The EPS formula under **debt–equity plan** is:

$$EPS = \frac{(1 - T) (EBIT - INT)}{N_2}$$

where INT is the interest charges on debt and N_2 is the number of ordinary shares under second plan. Setting the two formulae equal, we have:

$$\frac{(1 - T) EBIT}{N_1} = \frac{(1 - T) (EBIT - INT)}{N_2} \quad (13)$$

Using the values for Financial Plans I and II given in the example, we can determine EBIT as follows:

$$\begin{aligned}\frac{(1-0.5)EBIT}{50,000} &= \frac{(1-0.5)(EBIT-18,750)}{37,500} \\ 0.5 EBIT \frac{37,500}{50,000} &= 0.5 EBIT - 9,375 \\ 9,375 &= 0.5 EBIT - 0.375 EBIT \\ EBIT &= \frac{9,375}{0.125} = \text{Rs } 75,000\end{aligned}$$

We can simplify Equation (13) as follows:

$$EBIT = \frac{N_1}{N_1 - N_2} \times \text{INT} \quad (14)$$

Thus, in the example:

$$\begin{aligned}EBIT &= \frac{50,000}{50,000 - 37,500} \times 18,750 \\ &= 4 \times 18,750 = \text{Rs } 75,000\end{aligned}$$

Sometimes a firm may like to make a choice between two levels of debt. Then, the indifference point formula will be:

$$\frac{(1-T)(EBIT - \text{INT}_1)}{N_1} = \frac{(1-T)(EBIT - \text{INT}_2)}{N_2} \quad (15)$$

where INT_1 and INT_2 represent the interest charges under the alternative financial plans. After simplifying Equation (15), we obtain:

$$EBIT = \frac{N_1 \times \text{INT}_2 - N_2 \times \text{INT}_1}{N_1 - N_2} \quad (16)$$

Many other combinations of the methods of financing may be compared. The firm may compare between an all-equity plan and an equity-and-preference share plan. Then the indifference point formula will be:

$$\frac{(1-T)(EBIT)}{N_1} = \frac{(1-T)EBIT - \text{PDIV}}{N_2} \quad (17)$$

Equation (17) can be simplified as follows:

$$EBIT = \frac{N_1}{N_1 - N_2} \times \frac{\text{PDIV}}{1-T} \quad (18)$$

ILLUSTRATION 6.1: Calculation of Indifferent Points

Calculate the level of EBIT at which the indifference point between the following financing alternatives will occur:

- Ordinary share capital ₹ 10 lakh or 15% debentures of ₹ 5 lakh and ordinary share capital of ₹ 5 lakh.
- Ordinary share capital of ₹ 10 lakh or 13% preference share capital of ₹ 5 lakh and ordinary share capital of ₹ 5 lakh.

NOTES

NOTES

- Ordinary share capital of ₹ 10 lakh or ordinary share capital of ₹ 5 lakh, 13% preference share capital of ₹ 2 lakh and 15% debenture of ₹ 3 lakh.
- Ordinary share capital of ₹ 6 lakh and 15 debentures of ₹ 4 lakh or ordinary share capital of ₹ 4 lakh, 13% unit preference share capital of ₹ 2 lakh and 15% debentures of ₹ 4 lakh.
- Ordinary share capital of ₹ 8 lakh and 13% preference share capital of ₹ 2 lakh or ordinary share capital of ₹ 4 lakh, 13% preference share capital of ₹ 2 lakh and 15% debentures of ₹ 4 lakh.

Assume that the corporate tax rate is 50 per cent and the price of the ordinary share is ₹ 10 in each case.

The indifference points for the various combinations of the methods of finance are calculated as follows:

(i) Ordinary shares vs. ordinary shares and debentures:

$$\begin{aligned} \text{EBIT} &= \frac{N_1}{N_1 - N_2} \times \text{INT} \\ &= \frac{100,000}{100,000 - 50,000} \times 75,000 \\ &= \text{Rs } 150,000 \end{aligned}$$

(ii) Ordinary shares vs. ordinary and preference shares:

$$\begin{aligned} \text{EBIT} &= \frac{N_1}{N_1 - N_2} \times \frac{\text{PDIV}}{1 - T} \\ &= \frac{100,000}{100,000 - 50,000} \times \frac{65,000}{1 - 0.5} \\ &= 2 \times 130,000 = \text{Rs } 260,000 \end{aligned}$$

(iii) Ordinary shares vs. ordinary and preference shares and debentures

$$\begin{aligned} \text{EBIT} &= \frac{N_1}{N_1 - N_2} \times \left[\text{INT} + \frac{\text{PDIV}}{(1 - T)} \right] \\ &= \frac{100,000}{100,000 - 50,000} \times \left[45,000 + \frac{26,000}{(1 - 0.5)} \right] \\ &= 2 \times (45,000 + 52,000) = \text{Rs } 194,000 \end{aligned}$$

(iv) Ordinary shares and debentures vs. ordinary and preference shares and debentures:

$$\begin{aligned} \text{EBIT} &= \frac{N_1}{N_1 - N_2} \times \left[\text{INT}_2 + \frac{\text{PDIV}}{(1 - T)} \right] \\ &\quad - \left[\frac{N_2}{N_1 - N_2} \times \text{INT}_1 \right] \\ &= \frac{60,000}{60,000 - 40,000} \times \left[60,000 + \frac{26,000}{(1 - 0.5)} \right] \\ &\quad - \left[\frac{40,000}{60,000 - 40,000} \times 60,000 \right] \\ &= (3 \times 112,000) - (2 \times 60,000) \\ &= \text{Rs } 216,000 \end{aligned}$$

- (v) Ordinary shares and preference shares vs. ordinary and preference shares and debentures:

$$\begin{aligned} \text{EBIT} &= \frac{N_1}{N_1 - N_2} \times \left[\text{INT} + \frac{\text{PDIV}_2}{(1-T)} \right] \\ &\quad - \left[\frac{N_2}{N_1 - N_2} \times \frac{\text{PDIV}_1}{(1-T)} \right] \\ &= \frac{80,000}{80,000 - 40,000} \times \left(60,000 + \frac{26,000}{1-0.5} \right) \\ &\quad - \left(\frac{40,000}{80,000 - 40,000} \times \frac{26,000}{1-0.5} \right) \\ &= 2 \times 112,000 - 1 \times 52,000 \\ &= \text{Rs } 172,000 \end{aligned}$$

NOTES

6.4 COMBINING FINANCIAL AND OPERATING LEVERAGES

Operating leverage affects a firm's operating profit (EBIT), while **financial leverage** affects profit after tax or the earnings per share. The combined effect of two leverages can be quite significant for the earnings available to ordinary shareholders.

Degree of Operating Leverage

The **degree of operating leverage** (DOL) is defined as the percentage change in the earnings before interest and taxes relative to a given percentage change in sales. Thus:

$$\text{DOL} = \frac{\% \text{Change in EBIT}}{\% \text{Change in Sales}}$$

$$\text{DOL} = \frac{\Delta \text{EBIT} / \text{EBIT}}{\Delta \text{Sales} / \text{Sales}} \quad (19)$$

The following equation is also used for calculating DOL:

$$\text{DOL} = \frac{Q(s - v)}{Q(s - v) - F} \quad (20)$$

where Q is the units of output, s is the unit selling price, v is the unit variable cost and F is the total fixed costs. Equation (20) can also be written as follows:

$$\text{DOL} = \frac{\text{Contribution}}{\text{EBIT}} \quad (21)$$

Since contribution = EBIT + Fixed cost, Equation (21) can be expressed as follows:

$$\text{DOL} = \frac{\text{EBIT} + \text{Fixed Cost}}{\text{EBIT}} = 1 + \frac{F}{\text{EBIT}} \quad (22)$$

Suppose that in the earlier example of Brightways Ltd the management had developed the following income statement based on an expected sales volume of 100,000 units:

Check Your Progress

4. State the primary motive of a company in using financial leverage.
5. What are the assumptions on which the role of financial leverage is based upon?

NOTES

	₹
Sales (100,000 units at ₹ 8)	800,000
Less: Variable costs (100,000 at ₹ 4)	<u>400,000</u>
Contribution	400,000
Less: Fixed costs	<u>280,000</u>
EBIT	120,000

Applying Equation (20), DOL is:

$$\begin{aligned} \text{DOL} &= \frac{100,000 (\text{Rs } 8 - \text{Rs } 4)}{100,000 (\text{Rs } 8 - \text{Rs } 4) - \text{Rs } 280,000} \\ &= \frac{\text{Rs } 400,000}{120,000} = 3.33 \end{aligned}$$

DOL of 3.33 implies that for a given change in Brightways' sales, EBIT will change by 3.33 times.

Let us suppose in the case of Brightways that a technical expert appointed by the management tells them that they can choose a more automated production processes which will reduce unit variable cost to ₹ 2 but will increase fixed costs to ₹ 480,000. If the management accepts the expert's advice, then the income statement will look as follows:

	₹
Sales (100,000 at ₹ 8)	800,000
Less: Variable costs (100,000 at ₹ 2)	<u>200,000</u>
Contribution	600,000
Less: Fixed costs	<u>480,000</u>
EBIT	120,000

With high fixed costs and low variable costs, DOL for Brightways will be:

$$\text{DOL} = \frac{\text{Rs } 600,000}{\text{Rs } 120,000} = 5.0$$

If Brightways Ltd chooses the high-automated technology and if its actual sales happen to be more than expected, its EBIT will increase greatly; an increase of 100 per cent in sales will lead to a 500 per cent increase in EBIT.

Degree of Financial Leverage

We have seen earlier in this chapter that financial leverage affects the earnings per share. When the economic conditions are good and the firm's EBIT is increasing, its EPS increases faster with more debt in the capital structure. The **degree of financial leverage** (DFL) is defined as the percentage change in EPS due to a given percentage change in EBIT:

$$\text{DFL} = \frac{\% \text{ Change in EPS}}{\% \text{ Change in EBIT}}$$

$$\text{or} \quad \text{DFL} = \frac{\Delta \text{EPS}/\text{EPS}}{\Delta \text{EBIT}/\text{EBIT}} \quad (23)$$

In the case of Brightways Ltd, when EBIT increases from ₹ 120,000 to ₹ 160,000, EPS increases from ₹ 1.65 to ₹ 2.45, when it employs 50 per cent debt and pays interest charges of ₹ 37,500 (see Table 6.6). Applying Equation (23), DFL at EBIT of ₹ 120,000 is:

$$\begin{aligned} \text{DFL} &= \frac{(2.45 - 1.65)/1.65}{(160,000 - 120,000)/120,000} \\ &= \frac{0.485}{0.333} = 1.456 \end{aligned}$$

This implies that for a given change in EBIT, EPS will change by 1.456 times.

The following equation can also be used to calculate DFL:

$$\text{DFL} = \frac{\text{EBIT}}{\text{EBIT} - \text{INT}} = \frac{\text{EBIT}}{\text{PBT}} = 1 + \frac{\text{INT}}{\text{PBT}} \quad (24)$$

We know that $\text{EBIT} = Q(p - v) - F$ (and $\text{EBIT} - \text{INT} = \text{PBT}$). Thus Equation (24) can also be written as follows:

$$\text{DFL} = \frac{Q(s - v) - F}{Q(s - v) - F - \text{INT}} \quad (25)$$

The numerator of Equation (24) or (25) is earnings before interest and taxes and the denominator is profit before taxes.

In the example, Brightways Ltd was considering four alternative debt levels (see Table 6.5). Applying Equation (24), DFL for those alternatives at EBIT of ₹ 120,000 is given below:

Table 6.9 Degree of Financial Leverage of Alternative Financial Plans at EBIT of ₹ 120,000

Debt Level	DFL
0	1.000
25%	1.185
50%	1.456
75%	1.882

It is indicated from Table 6.9 that if the firm does not employ any debt, EPS will increase at the same rate at which EBIT increases. EPS increases faster for a given increase in EBIT when debt is introduced in the capital structure; more the debt in the capital structure, the greater the increase in EPS. The opposite will happen if EBIT declines—the greater will be the fall in EPS with more debt in the capital structure.

6.4.1 Composite Leverage: Combined Effect of Operating and Financial Leverages

Composite leverage is used to calculate the combined effect of operating and financial leverages.

Thus, composite leverage can be computed by multiplying operating leverage and the financial leverage by way of a formula:

$$\text{Composite leverage} = \text{Operating leverage} \times \text{financial leverage}$$

NOTES

NOTES

Operating and financial leverages together cause wide fluctuation in EPS for a given change in sales. If a company employs a high level of operating and financial leverage, even a small change in the level of sales will have dramatic effect on EPS. A company with cyclical sales will have a fluctuating EPS; but the swings in EPS will be more pronounced if the company also uses a high amount of operating and financial leverage.

The degrees of operating and financial leverages can be combined to see the effect of total leverage on EPS associated with a given change in sales. The **degree of combined leverage** (DCL) is given by the following equation:

$$\begin{aligned} &= \frac{\% \text{ Change in EBIT}}{\% \text{ Change in sales}} \times \frac{\% \text{ Change in EPS}}{\% \text{ Change in EBIT}} \\ &= \frac{\% \text{ Change in EPS}}{\% \text{ Change in Sales}} \end{aligned} \quad (26)$$

Yet another way of expressing the degree of combined leverage is as follows:

$$\begin{aligned} \text{DCL} &= \frac{Q(s-v)}{Q(s-v)-F} \times \frac{Q(s-v)-F}{Q(s-v)-F-\text{INT}} \\ &= \frac{Q(s-v)}{Q(s-v)-F-\text{INT}} \end{aligned} \quad (27)$$

Since $Q(s-v)$ is contribution and $Q(s-v)-F-\text{INT}$ is the profit after interest but before taxes, Equation (27) can also be written as follows:

$$\begin{aligned} \text{DCL} &= \frac{\text{Contribution}}{\text{Profit before taxes}} \\ &= \frac{\text{EBIT} + \text{Fixed costs}}{\text{PBT}} \\ &= \frac{\text{PBT} + \text{INT} + F}{\text{PBT}} = 1 + \frac{\text{INT} + F}{\text{PBT}} \end{aligned} \quad (28)$$

For Brightways Ltd when it used less automated production processes, the combined leverage effect at a sales of ₹ 8 lakh (100,000 units at ₹ 8) and 50 per cent debt level is:

$$\begin{aligned} \text{DCL} &= \frac{100,000(8-4)}{100,000(8-4) - 280,000 - 37,500} \\ &= \frac{400,000}{82,500} = 4.85 \end{aligned}$$

In the case of Brightways Ltd the combined effect of leverage is to increase EPS by 4.85 times for one unit increase in sales when it chooses less automated production process and employs 50 per cent debt. Thus, if the Brightways' sales increase by 10 per cent from ₹ 8 lakh to ₹ 8.80 lakh, then EPS will increase by: $10\% \times 4.85 = 48.5\%$. EPS at the sales level of ₹ 8 lakh is ₹ 1.65 then the new EPS will be:

$$\text{EPS} = 1.65 \times 1.485 = \text{Rs } 2.45$$

Firms can employ operating and financial leverages in various combinations. Brightways Ltd, for example, can either choose high-automated production processes and high degree of operating leverages or low automated production processes and low degree of operating leverage associated with high or low level of debt. The following are the possible combinations of operating and financial leverages for Brightways Ltd:

Table 6.10 Combinations of Operating and Financial Leverage for Brightways Ltd

Low Automation			High Automation		
DOL	DFL	DCL	DOL	DFL	DCL
3.33	1.000	3.33	5.00	1.000	5.00
3.33	1.185	3.95	5.00	1.185	5.93
3.33	1.455	4.85	5.00	1.456	7.28
3.33	1.882	6.27	5.00	1.882	9.41

Table 6.10 indicates that the largest effect of leverage (9.41 times) will be obtained when the firm combines higher amount of operating leverage (5.00 times) with the highest level of debt (DFL = 1.882). If the company has this combination, EPS will increase by 9.41 times than the increase in sales. Thus, if Brightways' sales increase from ₹ 8 lakh to ₹ 11.60 lakh—an increase of 45 per cent and EPS increases from ₹ 2.55 to ₹ 13.35—an increase by 423 per cent (i.e., 45 per cent × 9.41). Detailed calculations are given in Table 6.11.

Table 6.11 Brightways Ltd: EPS Calculations for Change in Sales

Units sold	<u>100,000</u>	<u>145,000</u>
Sales (at ₹ 8)	800,000	1,160,000
Less: Variable costs (at ₹ 2)	<u>200,000</u>	<u>290,000</u>
Contribution	600,000	870,000
Less: Fixed costs	<u>480,000</u>	<u>480,000</u>
EBIT	120,000	390,000
Less: Interest	<u>56,250</u>	<u>56,250</u>
PBT	63,750	333,750
Less: Taxes (50%)	<u>31,875</u>	<u>166,875</u>
PAT	<u>31,875</u>	<u>166,875</u>
No. of shares	12,500	12,500
EPS	2.55	13.35
% Change in sales:	$\frac{1,160,000 - 800,000}{800,000} = 45\%$	
% Change in EPS:	$\frac{13.35 - 2.55}{2.55} = 423\%$	

This combination can, however, prove risky for the company. If sales decline, the adverse effect on EPS will be very severe. The right combination of operating and financial leverages will differ among companies. It would generally be governed by the behaviour of sales. Public utilities such as electricity companies can afford to combine high operating leverage with high financial leverage since they generally have stable or rising sales. A company whose sales fluctuate widely and erratically should avoid use of high leverage since it will be exposed to a very high degree of risk.

6.5 FINANCIAL LEVERAGE AND THE SHAREHOLDERS' RISK

We have seen that financial leverage magnifies the shareholders' earnings. We also find that the variability of EBIT causes EPS to fluctuate within wider ranges with debt in the capital structure. That is, with more debt, EPS rises and falls faster than the rise and fall in EBIT. Thus, financial leverage not only magnifies EPS but also increases its variability.

NOTES

Check Your Progress

- Define the degree of operating leverage.
- What is the degree of financial leverage?

NOTES

The variability of EBIT and EPS distinguish between two types of risk—**operating risk** and **financial risk**. The distinction between operating and financial risk was long ago recognized by Marshall in the following words:¹¹

... Let us suppose that two men are carrying on similar business, the one working with his own, the other chiefly with borrowed, capital. There is one set of risks common to both, which may be described as the trade risk of the particular business in which they are engaged.... But there is another set of risks, the burden of which has to be borne by the man working with borrowed capital, and not by another.

Operating Risk

Operating risk can be defined as the variability of EBIT (or return on assets). The environment—internal and external—in which a firm operates, determines the variability of EBIT. So long as the environment is given to the firm, *operating risk is an unavoidable risk*. A firm is better placed to face such risk if it can predict it with a fair degree of accuracy.

The variability of EBIT has two components:¹²

- variability of sales
- variability of expenses

Variability of sales: The variability of sales revenue is in fact a major determinant of operating risk. Sales of a company may fluctuate because of three reasons. First, the changes in general economic conditions may affect the level of business activity. Business cycle is an economic phenomenon, which affects sales of all companies. Second, certain events affect sales of companies belonging to a particular industry. For example, the general economic conditions may be good but a particular industry may be hit by recession. Other factors may include the availability of raw materials, technological changes, actions of competitors, industrial relations, shifts in consumer preferences and so on. Third, sales may also be affected by the factors, which are internal to the company. The change in management, the product-market decisions of the company and its investment policy, or strike in the company have a great influence on the company's sales.

Variability of expenses: Given the variability of sales, the variability of EBIT is further affected by the composition of fixed and variable expenses. Higher the proportion of fixed expenses relative to variable expenses, higher the degree of operating leverage. We have seen in the previous section that operating leverage affects EBIT. High operating leverage leads to faster increase in EBIT when sales are rising. In bad times when sales are falling, high operating leverage becomes a nuisance; EBIT declines at a greater rate than fall in sales. Operating leverage causes wide fluctuations in EBIT with varying sales. Operating expenses may also vary on account of changes in input prices, and may also contribute to the variability of EBIT.

Financial Risk

For a given degree of variability of EBIT, the variability of EPS (and ROE) increases with more financial leverage. The variability of EPS caused by the use of financial leverage is called **financial risk**. Firms exposed to same degree of operating risk can differ with respect to financial risk when they finance their assets differently. A totally equity financed firm will have no financial risk. But when debt is used, the firm adds financial risk. *Financial risk is, thus, an avoidable risk if the firm decides not to use any debt in its capital structure.*

Measuring the Operating and Financial Risk

How do we measure the riskiness of EBIT and EPS? We can use two measures of risk: the standard deviation and coefficient of variation. We first calculate the extent of Brightways' operating risk by determining the standard deviation and coefficient of variation of its expected earnings before interest and taxes. Table 6.12 shows the calculations.¹³

Table 6.12 indicates that the expected EBIT (₹ 120,000) has a standard deviation of ± ₹ 62,809, which means that on an average, EBIT will range between ₹ 57,191 to ₹ 182,809. The coefficient of variation, calculated by dividing standard deviation by the expected value of EBIT, is 52.34 per cent. Brightways Ltd's shareholders will be exposed to this risk even if the company does not use debt. In the absence of debt in the capital structure, the variability of the earnings available to the shareholders will be same as the variability of EBIT. The use of debt accentuates the variability of the shareholders' earnings.

Table 6.12 Standard Deviation and Coefficient Variation of Expected EBIT:
Brightways Ltd

Prob. P_j	$EBIT_j$	$P_j EBIT_j$	$EBIT_j - E(EBIT)$	$EBIT_j - E(EBIT)^2$	$P_j [EBIT_j - E(EBIT)]^2$
0.05	-25	-1.25	-145	21,025	1,051.25
0.10	50	5.00	-70	4,900	490.00
0.15	75	11.25	-45	2,025	303.75
0.35	120	42.00	0	0	0
0.30	160	48.00	40	1,600	480.00
0.05	300	15.00	180	32,400	1,620.00
E(EBIT) = 120.00					$\sigma^2 = 3,945.00$
$\sigma = \sqrt{3,945} = 62.809$ $CV = 62.809/120 = 0.5234$					

We can use the following formulae to calculate the expected earnings per share, $E(EPs)$ and its variance (σ^2), standard deviation (σ) and coefficient of variation (CV):

$$\begin{aligned}
 E(EPs) &= EPs_1 \times P_1 + EPs_2 \times P_2 + \dots + EPs_j P_j \\
 &= \sum_{j=1}^n EPs_j P_j
 \end{aligned} \tag{29}$$

$$\begin{aligned}
 \sigma^2(EPs) &= [EPs_1 - E(EPs)]^2 P_1 + [EPs_2 - E(EPs)]^2 P_2 \\
 &\quad + \dots + [EPs_j - E(EPs)]^2 P_j \\
 &= \sum_{j=1}^n [EPs_j - E(EPs)]^2 P_j
 \end{aligned} \tag{30}$$

$$\sigma(EPs) = \sqrt{\sigma^2(EPs)} \tag{31}$$

$$CV = \sigma(EPs) / E(EPs) \tag{32}$$

Plan I

NOTES

NOTES

$$E(\text{EPS}) = (-0.25 \times 0.05) + (0.50 \times 0.10) + (0.75 \times 0.15) \\ + (1.20 \times 0.35) + (1.60 \times 0.30) + (3.00 \times 0.05) \\ = 1.20$$

$$\sigma^2(\text{EPS}) = (-0.25 - 1.20)^2 \times 0.05 + (0.50 - 1.20)^2 \times 0.10 \\ + (0.75 - 1.20)^2 \times 0.15 + (1.20 - 1.20)^2 \times 0.35 \\ + (1.60 - 1.20)^2 \times 0.30 + (3.00 - 1.20)^2 \times 0.05 \\ = 0.3945$$

$$\sigma(\text{EPS}) = \sqrt{0.3945} = 0.6281$$

$$CV = 0.6281/1.20 = 0.5234 \quad \text{or} \quad 52.34\%$$

Plan II

$$E(\text{EPS}) = (-0.58 \times 0.05) + (0.42 \times 0.10) + (0.75 \times 0.15) \\ + (1.35 \times 0.35) + (1.88 \times 0.30) + (3.75 \times 0.05) \\ = 1.35$$

$$\sigma^2(\text{EPS}) = (-0.58 - 1.35)^2 \times 0.05 + (0.42 - 1.35)^2 \times 0.10 \\ + (0.75 - 1.35)^2 \times 0.15 + (1.35 - 1.35)^2 \times 0.35 \\ + (1.88 - 1.35)^2 \times 0.30 + (3.75 - 1.35)^2 \times 0.05 \\ = 0.6990$$

$$\sigma(\text{EPS}) = \sqrt{0.6990} = 0.8361$$

$$CV = 0.8361/1.35 = 0.6193 \quad \text{or} \quad 61.93\%$$

Plan III

$$E(\text{EPS}) = (-1.25 \times 0.05) + (0.25 \times 0.10) + (0.75 \times 0.15) \\ + (1.65 \times 0.35) + (2.45 \times 0.30) + (5.25 \times 0.05) \\ = 1.65$$

$$\sigma^2(\text{EPS}) = (-1.25 - 1.65)^2 \times 0.05 + (0.25 - 1.65)^2 \times 0.10 \\ + (0.75 - 1.65)^2 \times 0.15 + (1.65 - 1.65)^2 \times 0.35 \\ + (2.45 - 1.65)^2 \times 0.30 + (5.25 - 1.65)^2 \times 0.05 \\ = 1.578$$

$$\sigma(\text{EPS}) = \sqrt{1.578} = 1.2562$$

$$CV = 1.2562/1.65 = 0.7613 \quad \text{or} \quad 76.13\%$$

Plan IV

$$E(\text{EPS}) = (-3.25 \times 0.05) + (0.25 \times 0.10) + (0.75 \times 0.15) \\ + (2.55 \times 0.35) + (4.15 \times 0.30) + (9.75 \times 0.05) \\ = 2.55$$

$$\sigma^2(\text{EPS}) = (-3.25 - 2.55)^2 \times 0.05 + (0.25 - 2.55)^2 \times 0.10 \\ + (0.75 - 2.55)^2 \times 0.15 + (2.55 - 2.55)^2 \times 0.35 \\ + (4.15 - 2.55)^2 \times 0.30 + (9.75 - 2.55)^2 \times 0.05 \\ = 6.312$$

$$\sigma(\text{EPS}) = \sqrt{6.312} = 2.5124$$

$$CV = 2.5124/2.55 = 0.9852 \quad \text{or} \quad 98.52\%$$

Data in Table 6.13 shows that the shareholders are always exposed to basic business risk. With variations in sales and expenses, EBIT fluctuates. The variability of EPS measured in terms of the coefficient of variation is same as that of EBIT when the firm does not use any debt.

Table 6.13 Variability of EBIT and EPS—Summary

Debt Ratio	Expected Value (₹)	Standard Deviation (₹) EBIT	Coefficient of Variation
	120,000	62,809	0.5234
		EPS	
0	1.20	0.6281	0.5234
25%	1.35	0.8361	0.6193
50%	1.65	1.2562	0.7613
75%	2.55	2.5124	0.9852

An increase in debt increases both the expected value of EPS and its standard deviation or coefficient of variation. Figure 6.4 shows the relationship of expected EPS and its standard deviation with debt. It is clearly indicated that debt increases both risk and return. The relationship between debt ratio and risk measured by the standard deviation is upward curvilinear. If we draw a graph relating debt ratio and coefficient of variation, a linear relationship will be found. What is important to note is that financial leverage adds to financial risk.

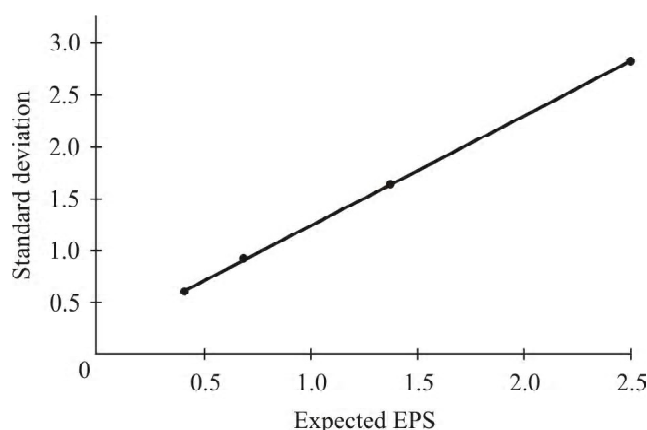


Fig. 6.4 Expected EPS and standard deviation

There is yet another way to see the risk of using debt. If we assume many possible levels of EBIT, then a continuous probability distribution of EPS can be drawn.¹⁴ Assuming only two levels of leverage, the probability distributions will look as shown in Figure 6.5. From the figure, we can see that the low-leverage financial plan has the tighter, more peaked, distribution. It will have smaller standard deviation or coefficient of variation. The high-leverage financial plan has higher expected EPS and is also more risky as it shows greater dispersion or variability.

NOTES

NOTES

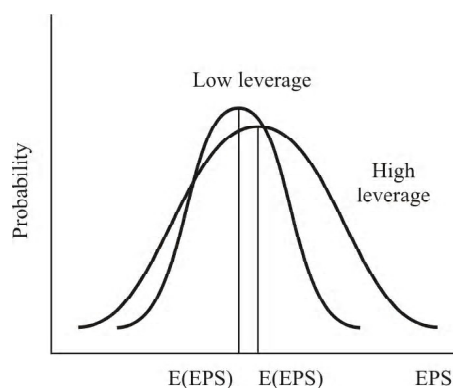


Fig. 6.5 Probability distribution of EPS

Risk-Return Trade-off

We have now a lot of information about Brightways Ltd. We know the firm's expected EPS and its variability. We also know expected EPS and its variability, in relation to the alternative levels of debt.

We find from Table 6.13 that for a given degree of operating risk (i.e., variability of EBIT), an increase in debt increases expected EPS as well as its variability. How much debt should Brightways employ? In fact, the firm faces a trade-off between risk and return. If the firm wants higher return (EPS or ROE) for the shareholders for a given level of EBIT, it will have to employ more debt and will also be exposed to greater risk (as measured by standard deviation or coefficient of variation). It should be noted that EBIT is a random variable. In an uncertain world, the actual EBIT may be so low that the solvency of the firm may be threatened.

Financial leverage increases the chance or probability of **insolvency**. Suppose two firms are identical except that one is levered and another is not. Each firm has an expected EBIT of ₹ 50,000. The interest burden of levered firm is ₹ 20,000. If the actual EBIT happens to be ₹ 10,000 in one year for both firms, the levered firm will not be able to meet its obligation to pay interest. The non-levered firm's shareholders still get a return of ₹ 10,000 (taxes are ignored). The levered firm can legally be forced into liquidation for non-payment of interest charges. If the insolvency proceedings actually follow, the levered firm will have to incur costs in the form of liquidation fees and other legal expenses. If the firm is not liquidated, it may be reorganized. During the reorganization period, its earnings will be reduced because of the additional costs and reduced sales volume due to the adverse effect on the firm's goodwill. If liquidation becomes unavoidable, the additional costs incurred would result in a decline in the net value of the firm's assets available to the shareholders after the creditors' claims have been satisfied. Leverage has benefits as well as costs—it is not an unmixed blessing.

Illustrative solved problems

PROBLEM 6.1: AB Ltd needs ₹ 10 lakh (one million) for expansion. The expansion is expected to yield an annual EBIT of ₹ 160,000. In choosing a financial plan, AB Ltd has an objective of maximizing earnings per share. It is considering the possibility of issuing equity shares and raising debt of ₹ 100,000, or ₹ 400,000 or ₹ 600,000. The current market price per share is ₹ 25 and is expected to drop to ₹ 20 if the funds are borrowed in excess of ₹ 500,000. Funds can be borrowed at the rates indicated below: (a) up to ₹ 100,000 at 8%; (b) over ₹ 100,000 up to ₹ 500,000 at 12%; (c) over ₹ 500,000 at 18%.

Assume a tax rate of 50 per cent. Determine the EPS for the three financing alternatives.

Solution:

The EPS is determined as follows:

	<i>Alternatives</i>		
	<i>I</i> (₹ 100,000 debt) ₹	<i>II</i> (₹ 400,000 debt) ₹	<i>III</i> (₹ 600,000 debt) ₹
EBIT	160,000	160,000	160,000
Interest	8,000	44,000	74,000
PBT	152,000	116,000	86,000
Taxes at 50%	76,000	58,000	43,000
PAT	76,000	58,000	43,000
No. of shares	36,000	24,000	20,000
EPS	2.11	2.42	2.15

The second alternative maximizes EPS; therefore, it is the best financial alternative in the present case.

The interest charges for alternatives II and III are calculated as follows:

Interest calculation, alternative II

₹	₹
100,000 @ 8%	8,000
300,000 @ 12%	<u>36,000</u>
Total	<u>44,000</u>

Interest Calculation, Alternative III

₹	₹
100,000 @ 8%	8,000
400,000 @ 12%	48,000
100,000 @ 18%	<u>18,000</u>
Total	<u>74,000</u>

The number of shares are found out by dividing the amount to be raised through equity issue by the market price per share. The market price per share is ₹ 25 in case of first two alternatives and ₹ 20 in case of the last alternative.

PROBLEM 6.2: A company needs ₹ 500,000 for construction of a new plant. The following three financial plans are feasible: (i) The company may issue 50,000 ordinary shares at ₹ 10 per share. (ii) The company may issue 25,000 ordinary shares at ₹ 10 per share and 2,500 debentures of ₹ 100 denominations bearing a 8 per cent rate of interest. (iii) The company may issue 25,000 ordinary shares at ₹ 10 per share and 2,500 preference shares at ₹ 100 per share bearing a 8 per cent rate of dividend.

If the company's earnings before interest and taxes are ₹ 10,000, ₹ 20,000 ₹ 40,000, ₹ 60,000 and ₹ 100,000, what are the earnings per share under each of the three financial plans? Which alternative would you recommend and why? Determine the indifference points by formulae and graphically. Assume a corporate tax rate of 50 per cent.

NOTES

NOTES

Solution:

The earnings per share under the three financial plans are calculated as follows:

First Alternative:

	₹	₹	₹	₹	₹
EBIT	10,000	20,000	40,000	60,000	1,00,000
Interest	0	0	0	0	0
PBT	10,000	20,000	40,000	60,000	1,00,000
Taxes @ 50%	5,000	10,000	20,000	30,000	50,000
PAT	5,000	10,000	20,000	30,000	50,000
No. of shares	50,000	50,000	50,000	50,000	50,000
EPS	0.10	0.20	0.40	0.60	1.00

Second Alternative:

	₹	₹	₹	₹	₹
EBIT	10,000*	20,000	40,000	60,000	100,000
Interest	20,000*	20,000	20,000	20,000	20,000
PBT	(10,000)*	0	20,000	40,000	80,000
Taxes @ 50%	(5,000)*	0	10,000	20,000	40,000
PAT	(5,000)*	0	10,000	20,000	40,000
No. of shares	25,000*	25,000	25,000	25,000	25,000
EPS	(0.20)*	0.00	0.40	0.80	1.60

* It is assumed that the company will be able to set-off losses against other profits. If the company has no profits from other operations, losses will be carried forward.

Third Alternative:

	₹	₹	₹	₹	₹
EBIT	10,000	20,000	40,000	60,000	100,000
Interest	0	0	0	0	0
PBT	10,000	20,000	40,000	60,000	100,000
Taxes @ 50%	5,000	10,000	20,000	30,000	50,000
PAT	5,000	10,000	20,000	30,000	50,000
Pref. Dividend	20,000	20,000	20,000	20,000	20,000
PAT for ordinary shareholders	(15,000)	(10,000)	0	10,000	30,000
No. of shares	25,000	25,000	25,000	25,000	25,000
EPS	(0.60)	(0.40)	0.00	0.40	1.20

The choice of the financial plan will depend on the state of economic conditions. If the company's sales are increasing, the earnings per share will be maximum under the second financial alternative. Under favourable conditions, debt financing gives more benefit than equity or preference financing. Debt capital is cheaper than preference capital because interest on debt is tax deductible while preference dividend is not.

NOTES

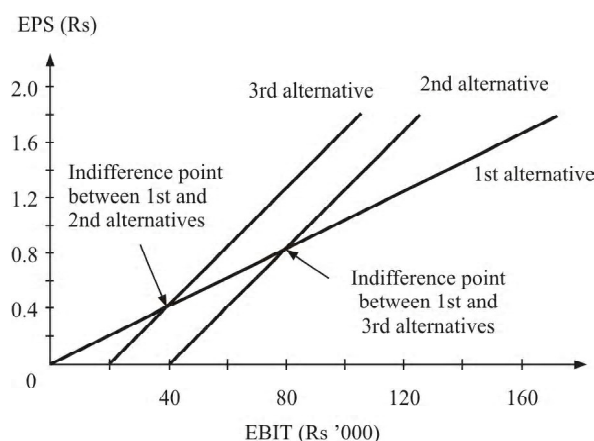


Fig. 6.6 EBIT–EPS chart

The indifference points are determined by formula and graphically as follows:

(i) Indifference point between first and second alternatives:

$$\frac{(1 - T)EBIT}{N_1} = \frac{(EBIT - INT)(1 - T)}{N_2}$$

$$\begin{aligned} EBIT &= \frac{N_1}{N_1 - N_2} \times INT \\ &= \frac{50,000}{50,000 - 25,000} \times 20,000 \\ EBIT &= 2 \times 20,000 = \text{Rs } 40,000 \end{aligned}$$

(ii) Indifference point between first and third alternatives:

$$\begin{aligned} \frac{(1 - T)EBIT}{N_1} &= \frac{(1 - T)EBIT - PDIV}{N_2} \\ EBIT &= \frac{N_1}{N_1 - N_2} \times \frac{PDIV}{1 - T} \\ &= \frac{50,000}{50,000 - 25,000} \times \frac{20,000}{1 - 0.5} \\ EBIT &= 2 \times 40,000 = \text{Rs } 80,000 \end{aligned}$$

PROBLEM 6.3: Two firms A and B have the following information:

(₹ lakh)

	Sales	Variable Costs	Fixed Costs
Firm A	1,800	450	900
Firm B	1,500	750	375

You are required to calculate (a) profit to sales ratio, (b) break-even point, and (c) the degree of operating leverage for both firms.

Comment on the positions of the firms. If sales increase by 20 per cent what shall be the impact on the profitability of the two firms?

NOTES

Solution:

(a) (i) Contribution ratio: Contribution/Sales

$$\text{Firm A: } \frac{1,800 - 450}{1,800} = \frac{1,350}{1,800} = 0.75 \text{ or } 75\%$$

$$\text{Firm B: } \frac{1,500 - 750}{1,500} = \frac{750}{1,500} = 0.50 \text{ or } 50\%$$

(ii) Profit margin: Profit/Sales

$$\text{Firm A: } \frac{1,350 - 900}{1,800} = \frac{450}{1,800} = 0.25 \text{ or } 25\%$$

$$\text{Firm B: } \frac{750 - 375}{1,500} = \frac{375}{1,500} = 0.25 \text{ or } 25\%$$

(b) Break-even point

$$\text{Firm A: } \frac{900}{0.75} = \text{Rs } 1,200$$

$$\text{Firm B: } \frac{375}{0.50} = \text{Rs } 750$$

(c) Degree of operating leverage: Contribution/EBIT

$$\text{Firm A: } \frac{1,350}{450} = 3.0$$

$$\text{Firm B: } \frac{750}{375} = 2.0$$

Firm A has a higher contribution ratio as well as a higher operating leverage. Therefore, under favourable economic conditions, the firm's profit margin (EBIT/Sales ratio) will increase at a fast rate. Firm B has a lower contribution ratio but a lower break-even point and operating leverage as compared to Firm A. Its profits would grow relatively at a lower rate. At present, the profit margin for the two firms is same, but it would change with change in sales. If sales increase by 20 per cent, then profit margin would be as follows:

$$\text{Firm A: } \frac{(1,800 \times 1.20)0.75 - 900}{1,800 \times 1.20} = \frac{720}{2,160} = 0.33 \text{ or } 33\%$$

$$\text{Firm B: } \frac{(1,500 \times 1.20)0.50 - 375}{1,500 \times 1.20} = \frac{525}{1,800} = 0.29 \text{ or } 29\%$$

You may notice that 20 per cent increase in sales led to 60 per cent increase in profits (from ₹ 450 lakh to ₹ 720 lakh) for A and 40 per cent increase for B (for ₹ 375 lakh to ₹ 525 lakh). This has changed the profit margin for A higher than B.

PROBLEM 6.4: Consider the following information for Kaunark Enterprise:

	₹ in lakh
EBIT	1,120
PBT	320
Fixed cost	700

Calculate percentage change in earnings per share if sales increased by 5 per cent.

Solution:

(a) Degree of operating leverage

$$\begin{aligned} \text{DOL} &= \frac{\text{Contribution}}{\text{EBIT}} = \frac{\text{EBIT} + \text{Fixed Cost}}{\text{EBIT}} \\ &= \frac{1,120 + 700}{1,120} = 1.625 \end{aligned}$$

(b) Degree of financial leverage

$$\text{DFL} = \frac{\text{EBIT}}{\text{PBT}} = \frac{1,120}{320} = 3.5$$

(c) Degree of combined leverage

$$\text{DCL} = \text{DOL} \times \text{DFL} = 1.625 \times 3.5 = 5.6875$$

Change in EPS can be calculated as:

$$\begin{aligned} \text{DCL} &= \frac{\% \text{ Change in EPS}}{\% \text{ Change in Sales}} \\ 5.6875 &= \frac{\% \text{ Change in EPS}}{5} \end{aligned}$$

$$\% \text{ change in EPS} = 5 \times 5.6875 = 28.4375\%$$

PROBLEM 6.5: Arun Chemicals Ltd is considering expansion of its plant capacity to meet the growing demand. The company would finance the expansion either with 15 per cent debentures or issue of 10 lakh shares at a price of ₹ 16 per share. The funds requirement is ₹ 160 lakh. The company's profit and loss statement before expansion is as follows.

	₹ lakh
Sales	1,500
Less: Costs	1,050
EBIT	450
Less: Interest	50
PBT	400
Less: Tax at 51.75%	207
PAT	193
Number of shares (lakh)	50
EPS (₹)	3.86

The company's expected EBIT with associated probabilities after expansion is as follows:

EBIT (₹ lakh)	Probability
250	0.10
450	0.30
540	0.50
600	0.10

NOTES

You are required to calculate the company's expected EBIT and EPS and standard deviation of EPS and EBIT for each plan.

Solution:

NOTES

$$(a) \quad E(\text{EBIT}) = \text{EBIT}_1 \times P_1 + \text{EBIT}_2 \times P_2 + \text{EBIT}_3 \times P_3 + \dots$$

$$\text{Plan I and II: } E(\text{EBIT}) = 250 \times 0.10 + 450 \times 0.30 + 540 \times 0.50 + 600 \times 0.10 = 490$$

$$(b) \quad \sigma^2(\text{EBIT}) = [\text{EBIT}_1 - E(\text{EBIT})]^2 P_1 + [\text{EBIT}_2 - E(\text{EBIT})]^2 P_2 + [\text{EBIT}_3 - E(\text{EBIT})]^2 P_3 + \dots$$

$$= (250 - 490)^2 \times 0.10 + (450 - 490)^2 \times 0.30 + (540 - 490)^2 \times 0.50 + (600 - 490)^2 \times 0.10 = 8,700$$

$$\sigma(\text{EBIT}) = \sqrt{8,700} = 93.27$$

(i) Plan I: issue of 15% debenture (₹ lakh)

EBIT	250	450	540	630
Less: Interest*	74	74	74	74
PBT	176	376	466	556
Tax at 51.75%	91	195	241	288
PAT	85	181	225	268
No. of shares	50	50	50	50
EPS	1.70	3.62	4.50	5.36

* Includes existing and incremental interest.

$$E(\text{EPS}) = 1.70 \times 0.10 + 3.62 \times 0.30 + 4.50 \times 0.50 + 5.36 \times 0.10 = 4.036$$

$$\sigma^2(\text{EPS}) = (1.70 - 4.036)^2 \times 0.10 + (3.62 - 4.036)^2 \times 0.30 + (4.50 - 4.036)^2 \times 0.50 + (5.36 - 4.036)^2 \times 0.10 = 0.8805$$

$$\sigma(\text{EPS}) = \sqrt{0.8805} = 0.94$$

(ii) Plan II : Issue of shares (₹ lakh)

EBIT	250	450	540	630
Less: Interest	50	50	50	50
PBT	200	400	490	580
Tax at 51.75%	104	207	254	300
PAT	96	193	236	280
No of shares*	60	60	60	60
EPS	1.60	3.22	3.93	4.67

* Includes existing and new shares.

$$\begin{aligned}
 E(\text{EPS}) &= 1.60 \times 0.10 + 3.22 \times 0.30 + 3.93 \\
 &\quad \times 0.50 + 4.67 \times 0.10 \\
 &= 3.558 \\
 \sigma^2(\text{EPS}) &= (1.60 - 3.558)^2 \times 0.10 + (3.22 - 3.558)^2 \\
 &\quad \times 0.30 + (3.93 - 3.558)^2 \times 0.50 \\
 &\quad + (4.67 - 3.558)^2 \times 0.10 \\
 &= 0.610496 \\
 \sigma(\text{EPS}) &= \sqrt{0.610496} = 0.7813
 \end{aligned}$$

Plan I (issue of debenture) has not only a higher expected EPS but also a higher standard deviation as well. The coefficient of variation is: $0.94/4.036 = 0.233$ or 23.3%. The coefficient of variation of EPS under Plan II is: $0.7813/3.558 = 0.2196$ or 21.96%. Thus Plan I has higher return as well as higher risk. The firm's overall risk is reflected by the variability of EBIT. The coefficient of variation of EBIT is: $93.27/490 = 0.1903$ or 19.03%.

6.6 SUMMARY

- The term, capital structure, is used to represent the proportionate relationship between debt and equity.
- The use of the fixed-charges sources of funds, such as debt and preference capital along with the owners' equity in the capital structure, is described as financial leverage or gearing or trading on equity.
- The first two measures of financial leverage are also measures of capital gearing.
- The third measure of financial leverage, commonly known as coverage ratio, indicates the capacity of the company to meet fixed financial charges.
- One convenient and useful way of showing the relationship between EBIT and EPS for the alternative financial plans is to prepare the EBIT–EPS chart.
- Operating leverage affects a firm's operating profit (EBIT), while financial leverage affects profit after tax or the earnings per share. The combined effect of two leverages can be quite significant for the earnings available to ordinary shareholders.
- The degree of operating leverage (DOL) is defined as the percentage change in the earnings before interest and taxes relative to a given percentage change in sales.
- The degree of financial leverage (DFL) is defined as the percentage change in EPS due to a given percentage change in EBIT.
- Operating and financial leverages together cause wide fluctuation in EPS for a given change in sales.
- The variability of EBIT and EPS distinguish between two types of risk—operating risk and financial risk.
- Operating risk can be defined as the variability of EBIT (or return on assets). The environment—internal and external, in which a firm operates, determines the variability of EBIT.
- The variability of EBIT has two components—variability of sales and variability of expenses.

NOTES

Check Your Progress

8. Define operating risk.
9. State the two components of the variability of EBIT.
10. Define financial risk.

NOTES

- Financial risk is an avoidable risk if the firm decides not to use any debt in its capital structure.

6.7 KEY TERMS

- **Capital structure:** The term capital structure is used to represent the proportionate relationship between debt and equity.
- **Financial leverage:** The use of the fixed-charges sources of funds, such as debt and preference capital along with the owners' equity in the capital structure, is described as financial leverage or gearing or trading on equity.
- **Degree of operating leverage:** The degree of operating leverage (DOL) is defined as the percentage change in the earnings before interest and taxes relative to a given percentage change in sales.
- **Degree of financial leverage:** The degree of financial leverage (DFL) is defined as the percentage change in EPS due to a given percentage change in EBIT.
- **Operating risk:** Operating risk can be defined as the variability of EBIT (or return on assets). The environment—internal and external, in which a firm operates, determines the variability of EBIT.
- **Financial risk:** Financial risk is an avoidable risk if the firm decides not to use any debt in its capital structure.

6.8 ANSWERS TO 'CHECK YOUR PROGRESS'

1. The term capital structure is used to represent the proportionate relationship between debt and equity.
2. The use of the fixed-charges sources of funds, such as debt and preference capital along with the owners' equity in the capital structure, is described as financial leverage or gearing or trading on equity.
3. The third measure of financial leverage, commonly known as coverage ratio, indicates the capacity of the company to meet fixed financial charges.
4. The primary motive of a company in using financial leverage is to magnify the shareholders' return under favourable economic conditions.
5. The role of financial leverage in magnifying the return of the shareholders is based on the assumptions that the fixed-charges funds (such as the loan from financial institutions and banks or debentures) can be obtained at a cost lower than the firm's rate of return on net assets (RONA or ROI).
6. The degree of operating leverage (DOL) is defined as the percentage change in the earnings before interest and taxes relative to a given percentage change in sales.
7. The degree of financial leverage (DFL) is defined as the percentage change in EPS due to a given percentage change in EBIT.
8. Operating risk can be defined as the variability of EBIT (or return on assets). The environment—internal and external—in which a firm operates, determines the variability of EBIT.

9. The variability of EBIT has two components:
 - Variability of sales
 - Variability of expenses
10. Financial risk is an avoidable risk if the firm decides not to use any debt in its capital structure.

NOTES

6.9 QUESTIONS AND EXERCISES

Short-Answer Questions

1. Distinguish between capital and income gearing.
2. Distinguish between operating and financial leverage.
3. State the combined effect of operating and financial leverage.
4. Write a short note on the two components of the variability of EBIT.

Long-Answer Questions

1. Discuss the measures of financial leverage.
2. How do you measure operating and financial risk?
3. What is EBIT-EPS analysis?

6.10 FURTHER READING

- Pandey, IM. 2009. *Financial Management*. India: Vikas Publishing Pvt Ltd.
- Kuchal, SC. 1999. *Financial Management: An Analytical and Conceptual Approach*. India: Chaitanya Publishing house.
- Horne Van, C. James. 2001. *Financial Management and Policy*. New Delhi: Prentice Hall.

Endnotes

1. In USA the right-hand side of the balance sheet is used to show liabilities and equity.
2. Waterman, Merwin H., Trading on Equity, in Eitman, W.J. (ed.), *Essays on Business Finance*, Masterco Press, 1953.
3. *Ibid*.
4. Bierman, H., Jr., *Financial Policy*, Macmillan, 1970.
5. Fixed charges may also include sinking funds (SF). Then the ratio will be as follows:

$$L_3 = \frac{\text{EBIT}}{\text{Interest} + (\text{Sinking fund} / 1 - \text{Tax rate})}$$

Depreciations, being a non-cash item, may be included in the numerator of the equation.

6. Since, $L_1 = \frac{D}{D+E} = \frac{D}{V}$ then $D = L_1 V$. Similarly, since $L_2 = \frac{D}{E}$, then $D = L_2 E$.

Thus, $L_1 V = L_2 E, L_1 = L_2 \frac{E}{V} = L_2 \frac{V-D}{V}$ or $L_1 = L_2 - L_2 \frac{D}{V}$ or $L_1 = L_2 - L_2 L_1$.

Since, $\frac{D}{V} = L_1$ or $L_1 = \frac{L_2}{(1+L_2)}$ or $L_2 = \frac{L_1}{(1-L_1)}$.

NOTES

7. Bierman, *op. cit.*, 1970, p. 89.

8. If a company uses preference capital, then EPS may be calculated as follows:

$$\text{EPS} = \frac{(\text{EBIT} - \text{INT})(1 - T) - \text{PDIV}}{N}$$

Notice that PDIV, the preference dividend, is not tax deductible.

9. ROE can also be found out by dividing the earnings per share by the equity capital (book value) per share.

10. Bierman, *op. cit.*, 1970.

11. Marshall, A., *The Principles of Economics*. Macmillan 8th ed., 1952, pp. 589–90.

12. Solomn, E. and J.J. Pringle, *An Introduction to Financial Management*, Prentice-Hall of India, 1978, pp. 470–71.

13. The expected EBIT can be calculated as follows:

$$\text{DCL} = \frac{\text{Contribution}}{\text{EBIT} - \text{INT}} = \frac{\text{Contribution}}{\text{PBT}} = 1 + \frac{\text{INT} + f}{\text{PBT}}$$

and standard deviation of EBIT as:

$$\sigma(\text{EBIT}) = \sqrt{P_1 [(\text{EBIT}_1 - E(\text{EBIT}))^2] + P_2 [(\text{EBIT}_2 - E(\text{EBIT}))^2] \dots} = \sqrt{\sum_{j=1}^n P_j [(\text{EBIT}_j - E(\text{EBIT}))^2]}$$

where P_j is probability of occurrence of EBIT in j th event.

14. Weston, J.F. and E.F. Brigham, *Managerial Finance*, Halt, Rinehart & Weston, 1972, p. 256.

UNIT 7 WORKING CAPITAL MANAGEMENT

NOTES

Structure

- 7.0 Introduction
- 7.1 Unit Objectives
- 7.2 Concepts and Definition
 - 7.2.1 Focusing on Management of Current Assets
 - 7.2.2 Focusing on Liquidity Management
- 7.3 Financing Current Assets
 - 7.3.1 Matching Approach; 7.3.2 Conservative Approach
 - 7.3.3 Aggressive Approach
 - 7.3.4 Short-term vs. Long-term Financing: A Risk-Return Trade-off
- 7.4 Hedging Approach
 - 7.4.1 Risk Hedging with Options
- 7.5 Level of Current and Liquid Assets
- 7.6 Factors Affecting the Requirement of Working Capital
 - 7.6.1 Determinants of Working Capital
 - 7.6.2 Issues in Working Capital Management
- 7.7 Summary
- 7.8 Key Terms
- 7.9 Answers to 'Check Your Progress'
- 7.10 Questions and Exercises
- 7.11 Further Reading

7.0 INTRODUCTION

The management of current assets is similar to that of fixed assets in the sense that in both cases a firm analyses their effects on its return and risk. The management of fixed and current assets, however, differs in three important ways: *First*, in managing fixed assets, time is a very important factor; consequently, discounting and compounding techniques play a significant role in capital budgeting and a minor one in the management of current assets. *Second*, the large holding of current assets, especially cash, strengthens the firm's liquidity position (and reduces riskiness), but also reduces the overall profitability. Thus, a risk-return trade off is involved in holding current assets. *Third*, levels of fixed as well as current assets depend upon *expected sales*, but it is only current assets which can be adjusted with sales fluctuations in the short run. Thus, the firm has a greater degree of flexibility in managing current assets. The two main sources of working capital are trade credit and bank borrowing. Commercial paper is another important source of short-term funds. This unit will discuss various aspects of working capital management.

7.1 UNIT OBJECTIVES

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

- Discuss working capital management
- Examine how current assets are financed
- Discuss the hedging approach
- Describe the factors affecting the requirement of working capital

7.2 CONCEPTS AND DEFINITION

NOTES

There are two concepts of working capital—gross and net.

- **Gross working capital** refers to the firm's investment in current assets. **Current assets** are the assets which can be converted into cash within an accounting year and include cash, short-term securities, debtors, (accounts receivable or book debts) bills receivable and stock (inventory).
- **Net working capital** refers to the difference between current assets and current liabilities. **Current liabilities** are those claims of outsiders which are expected to mature for payment within an accounting year and include creditors (accounts payable), bills payable, and outstanding expenses. Net working capital can be positive or negative. A positive net working capital will arise when current assets exceed current liabilities. A negative net working capital occurs when current liabilities are in excess of current assets.

The two concepts of working capital—gross and net—are not exclusive; rather, they have equal significance from the management viewpoint.

7.2.1 Focusing on Management of Current Assets

The gross working capital concept focuses attention on two aspects of current assets management: (1) How to optimise investment in current assets? (2) How should current assets be financed?

The consideration of the level of investment in current assets should avoid two danger points—*excessive* or *inadequate* investment in current assets. Investment in current assets should be just adequate to the needs of the business firm. Excessive investment in current assets should be avoided because it impairs the firm's profitability, as idle investment earns nothing. On the other hand, inadequate amount of working capital can threaten solvency of the firm because of its inability to meet its current obligations. It should be realised that the working capital needs of the firm may be fluctuating with changing business activity. This may cause excess or shortage of working capital frequently. The management should be prompt to initiate an action and correct imbalances.

Another aspect of the gross working capital points to the need of arranging funds to finance current assets. Whenever a need for working capital funds arises due to the increasing level of business activity or for any other reason, financing arrangement should be made quickly. Similarly, if suddenly, some surplus funds arise they should not be allowed to remain idle, but should be invested in short-term securities. Thus, the financial manager should have knowledge of the sources of working capital funds as well as investment avenues where idle funds may be temporarily invested.

7.2.2 Focusing on Liquidity Management

Net working capital is a qualitative concept. It indicates the liquidity position of the firm and suggests the extent to which working capital needs may be financed by permanent sources of funds. Current assets should be sufficiently in excess of current liabilities to constitute a margin or buffer for maturing obligations within the ordinary operating cycle of a business. In order to protect their interests, short-term creditors always like a company to maintain current assets at a higher level than current liabilities. It is a conventional rule

to maintain the level of current assets twice the level of current liabilities. However, the quality of current assets should be considered in determining the level of current assets *vis-à-vis* current liabilities. A weak liquidity position poses a threat to the solvency of the company and makes it unsafe and unsound. A negative working capital means a negative liquidity, and may prove to be harmful for the company's reputation. Excessive liquidity is also bad. It may be due to mismanagement of current assets. Therefore, prompt and timely action should be taken by management to improve and correct the imbalances in the liquidity position of the firm.

Net working capital concept also covers the question of judicious mix of long-term and short-term funds for financing current assets. For every firm, there is a minimum amount of net working capital which is permanent. Therefore, a portion of the working capital should be financed with the permanent sources of funds such as equity share capital, debentures, long-term debt, preference share capital or retained earnings. Management must, therefore, decide the extent to which current assets should be financed with equity capital and/or borrowed capital.

In summary, it may be emphasised that both gross and net concepts of working capital are equally important for the efficient management of working capital. There is no precise way to determine the exact amount of gross, or net working capital for any firm. The data and problems of each company should be analysed to determine the amount of working capital. There is no specific rule as to how current assets should be financed. It is not feasible in practice to finance current assets by short-term sources only. Keeping in view the constraints of the individual company, a judicious mix of long and short-term finances should be invested in current assets. Since current assets involve cost of funds, they should be put to productive use.

7.3 FINANCING CURRENT ASSETS

A firm can adopt different financing policies *vis-à-vis* current assets. Three types of financing may be distinguished:

- **Long-term financing** The sources of long-term financing include ordinary share capital, preference share capital, debentures, long-term borrowings from financial institutions and reserves and surplus (retained earnings).
- **Short-term financing** The short-term financing is obtained for a period less than one year. It is arranged in advance from banks and other suppliers of short-term finance in the money market. Short-term finances include working capital funds from banks, public deposits, commercial paper, factoring of receivable etc.
- **Spontaneous financing** Spontaneous financing refers to the *automatic* sources of short-term funds arising in the normal course of a business. Trade (suppliers') credit and outstanding expenses are examples of spontaneous financing. There is no explicit cost of spontaneous financing. A firm is expected to utilise these sources of finances to the fullest extent. The real choice of financing current assets, once the spontaneous sources of financing have been fully utilised, is between the long-term and short-term sources of finances.

What should be the mix of short-and long-term sources in financing current assets?

NOTES

Check Your Progress

1. Differentiate between gross working and net working capital.
2. While deciding on the level of current assets, which are the risks that the management of the firm should avoid?
3. Why is the concept of net working capital important from a liquidity management perspective?

NOTES

Depending on the mix of short- and long-term financing, the approach followed by a company may be referred to as:

- Matching approach
- Conservative approach
- Aggressive approach

7.3.1 Matching Approach

The firm can adopt a financial plan which matches the expected life of assets with the expected life of the source of funds raised to finance assets. Thus, a ten-year loan may be raised to finance a plant with an expected life of ten years; stock of goods to be sold in thirty days may be financed with a thirty-day commercial paper or a bank loan. The justification for the exact matching is that, since the purpose of financing is to pay for assets, the source of financing and the asset should be relinquished simultaneously. Using long-term financing for short-term assets is expensive as funds will not be utilised for the full period. Similarly, financing long-term assets with short-term financing is costly as well as inconvenient as arrangement for the new short-term financing will have to be made on a continuing basis.

When the firm follows **matching approach** (also known as **hedging approach**), long-term financing will be used to finance fixed assets and permanent current assets and short-term financing to finance temporary or variable current assets. However, it should be realised that exact matching is not possible because of the uncertainty about the expected lives of assets.

Figure 7.1 is used to illustrate the matching plan over time.¹ The firm's fixed assets and permanent current assets are financed with long-term funds and as the level of these assets increases, the long-term financing level also increases. The temporary or variable current assets are financed with short-term funds and as their level increases, the level of short-term financing also increases. Under matching plan, no short-term financing will be used if the firm has a fixed current assets need only.

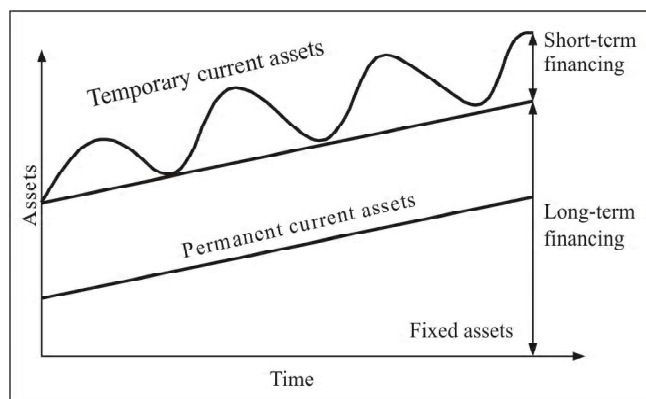


Fig. 7.1 Financing Under Matching Plan

7.3.2 Conservative Approach

A firm in practice may adopt a **conservative approach** in financing its current and fixed assets. The financing policy of the firm is said to be conservative when it depends more on long-term funds for financing needs. Under a conservative plan, the firm finances its permanent assets and also a part of temporary current assets with long-term financing.

In the periods when the firm has no need for temporary current assets, the idle long-term funds can be invested in the tradable securities to conserve liquidity. The conservative plan relies heavily on long-term financing and, therefore, the firm has less risk of facing the problem of shortage of funds. The conservative financing policy is shown in Figure 7.2.² Note that when the firm has no temporary current assets [e.g., at (a) and (b)]; the long-term funds released can be invested in marketable securities to build up the liquidity position of the firm.

NOTES

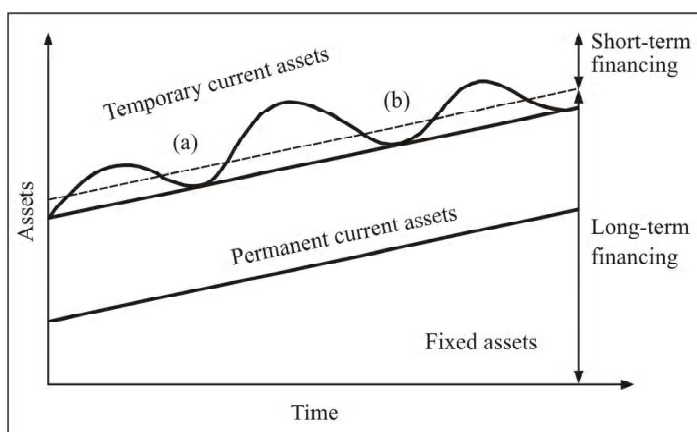


Fig. 7.2 Conservative Financing

7.3.3 Aggressive Approach

A firm may be aggressive in financing its assets. An **aggressive policy** is said to be followed by the firm when it uses more short-term financing than warranted by the matching plan. Under an aggressive policy, the firm finances a part of its permanent current assets with short-term financing. Some extremely aggressive firms may even finance a part of their fixed assets with short-term financing. The relatively more use of short-term financing makes the firm more risky. The aggressive financing is illustrated in Figure 7.3.³

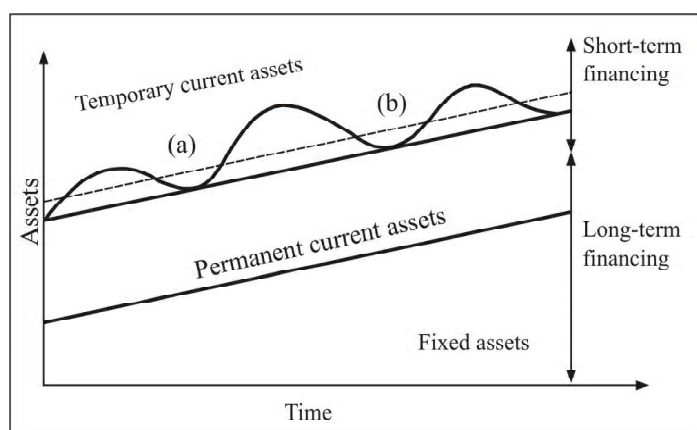


Fig. 7.3 Aggressive Financing

7.3.4 Short-term vs. Long-term Financing: A Risk-Return Trade-off

A firm should decide whether or not it should use short-term financing. If short-term financing has to be used, the firm must determine its portion in total financing. This

NOTES

decision of the firm will be guided by the risk-return trade-off. Short-term financing may be preferred over long-term financing for two reasons: (i) the cost advantage and (ii) flexibility.⁴ But short-term financing is more risky than long-term financing.

Cost: Short-term financing should generally be less costly than long-term financing. It has been found in developed countries, like USA, that the rate of interest is related to the maturity of debt. The relationship between the maturity of debt and its cost is called the **term structure of interest rates**. The curve, relating to the maturity of debt and interest rates, is called the **yield curve**. The yield curve may assume any shape, but it is generally *upward sloping*. Figure 7.4 shows the yield curve. The figure indicates that more the maturity greater the interest rate.

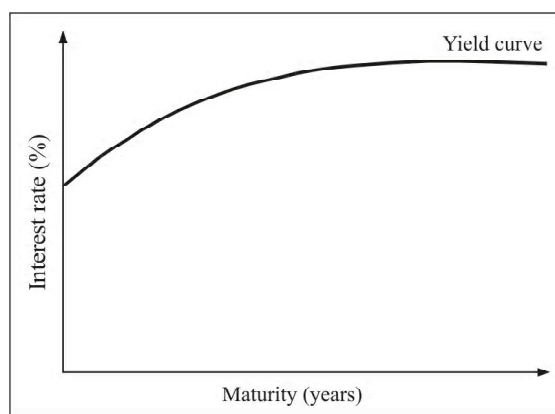


Fig. 7.4 Yield Curve

The justification for the higher cost of long-term financing can be found in the **liquidity preference theory**. This theory says that since lenders are risk averse, and risk generally increases with the length of lending time (because it is more difficult to forecast the more distant future), most lenders would prefer to make short-term loans. The only way to induce these lenders to lend for longer periods is to offer them higher rates of interest.

The cost of financing has an impact on the firm's return. Both short and long-term financing have a leveraging effect on shareholders' return. But the short-term financing ought to cost less than the long-term financing; therefore, it gives relatively higher return to shareholders.

It is noticeable that in India short-term loans cost more than long-term loans. Banks are the major suppliers of the working capital finance in India. Their rates of interest on working capital finance are quite high. The main source of long-term loans are financial institutions which till recently were not charging interest at differential rates. The prime rate of interest charged by financial institutions is lower than the rate charged by banks.

Flexibility It is relatively easy to refund short-term funds when the need for funds diminishes. Long-term funds such as debenture loan or preference capital cannot be refunded before time. Thus, if a firm anticipates that its requirements for funds will diminish in near future, it would choose short-term funds.

Risk Although short-term financing may involve less cost, it is more risky than long-term financing. If the firm uses short-term financing to finance its current assets, it runs the risk of renewing borrowings again and again. This is particularly so in

the case of permanent assets. As discussed earlier, permanent current assets refer to the minimum level of current assets which a firm should always maintain. If the firm finances its permanent current assets with short-term debt, it will have to raise new short-term funds as debt matures. This continued financing exposes the firm to certain risks. It may be difficult for the firm to borrow during stringent credit periods. At times, the firm may be unable to raise any funds and consequently, its operating activities may be disrupted. In order to avoid failure, the firm may have to borrow at most inconvenient terms. These problems are much less when the firm finances with long-term funds. There is less risk of failure when the long-term financing is used.

Risk-return trade-off Thus, there is a conflict between long-term and short-term financing. Short-term financing is less expensive than long-term financing, but, at the same time, short-term financing involves greater risk than long-term financing. The choice between long-term and short-term financing involves a trade-off between risk and return. This trade-off may be further explained with the help of an example in Illustration 7.1.

Illustration 7.1: Working Capital Financing: Risk-return Trade-off

Suppose that a firm has an investment of ₹ 50 crore in assets, ₹ 30 crore invested in fixed assets and ₹ 20 crore in current assets. It is expected that assets will yield a return of 18 per cent before interest and taxes. Tax rate is assumed to be 35 per cent. The firm maintains a debt ratio of 60 per cent. Thus, the firm's assets are financed by 40 per cent equity that is ₹ 20 crore equity funds are invested in its total assets. The firm has to decide whether it should use a 12 per cent short-term debt or a 14 per cent long-term debt to finance its current assets. The financing plans would affect the return on equity funds differently. The calculations of return on equity are shown in Table 7.1.

Table 7.1 Effect of Long-Term and Short-Term Financing

	Financing Plan		
	Conservative	Moderate	Aggressive
	₹'000	₹'000	₹'000
Fixed assets	300,000	300,000	300,000
Current assets	200,000	200,000	200,000
Total assets	500,000	500,000	500,000
Short-term debt (12%)	60,000	150,000	300,000
Long-term debt (14%)	240,000	150,000	0
PBIT	90,000	90,000	90,000
Interest	40,800	39,000	36,000
EBT	49,200	51,000	54,000
Tax (35%)	17,220	17,850	18,900
Net income	31,980	33,150	35,100
Return on equity	16.00%	16.58%	17.55%
SF/TF	12%	30%	60%

* SF = Short-term financing, TF = Total financing.

It is shown in Table 7.1 that return on equity is highest under the aggressive plan and lowest under the conservative plan. The results of moderate plan are in between

NOTES

NOTES

these two extremes. However, the aggressive plan is the most risky as short-term financing as a ratio of total financing is maximum in this case. The short-term financing to total financing ratio is minimum in case of the conservative plan and, therefore, it is less risky.

Let us summarise our discussion on the structure and financing of current assets. The relative liquidity of the firm's assets structure is measured by current assets to fixed assets (or current assets to total assets) ratio. The greater this ratio, the less risky as well as less profitable will be the firm and *vice versa*. Similarly, the relative liquidity of the firm's financial structure can be measured by the short-term financing to total financing ratio. The lower this ratio, the less risky as well as profitable will be the firm and *vice versa*. In shaping its working capital policy, the firm should keep in mind these two dimensions—*relative asset liquidity* (level of current assets) and *relative financing liquidity* (level of short-term financing) of the working capital management. A firm will be following a very conservative working capital policy if it combines a high level of current assets with a high level of long-term financing (or low level of short-term financing). Such a policy will not be risky at all but would be less profitable. An aggressive firm, on the other hand, would combine low level of current assets with a low level of long-term financing (or high level of short-term financing). This firm will have high profitability and high risk. In fact, the firm may follow a conservative financing policy to counter its relatively liquid assets structure in practice. The conclusion of all this is that the considerations of assets and financing mix are crucial to the working capital management.

7.4 HEDGING APPROACH

The term derivatives can simply be understood as those items that do not have their own independent values, rather they have derived values. Derivatives have a significant place in finance and risk management. A **derivative** is a financial instrument whose pay-off is derived from some other asset which is called **an underlying** asset. An option is a derivative. For example, in case of a stock option, the underlying asset is share (stock) of a company. The value of the stock option depends on the value of the share. Options are more complicated derivatives. There are a large number of simple derivatives like futures or forward contracts or swaps.

Firms do not like risk; they do not consider it desirable. Firms will take risks only when they are appropriately compensated for the risk. By reducing risk, they can avoid cash flow fluctuations and thus, increase value of their assets or investments. Not surprisingly, firms always look for ways and means of reducing their risk. Derivatives are tools to reduce a firm's risk exposure. A firm can do away with unnecessary parts of risk exposure and even convert exposures into quite different forms by using derivatives. **Hedging** is the term used for reducing risk by using derivatives.

There are several advantages of better risk management through hedging:

1. **Debt capacity enhancement:** Financial risk management helps to understand and manage investment and financing risk. It reduces a firm's costs of financial distress. Hence, the firm can increase debt capacity and interest tax shield.
2. **Increased focus on operations:** Financial risk management requires managers to hedge against possible movements in interest rates and exchange rates. These factors are not under the control of managers nor can they predict their behaviour. Hedging against such risks encourages

Check Your Progress

4. What are the main long-term and short-term sources for financing working capital?
5. What should be the mix of short-term and long term sources in financing current assets?

managers to concentrate their efforts on improving operations rather than worrying about factors that are not in their control.

3. **Isolating managerial performance:** Hedging helps to separate out the effects of fluctuating external factors (interest or exchange rate) and good or bad management on the firm's profitability. If a company that always hedges its risk suffers a loss or its profits drop, then it means bad management.

In the following sections, we shall discuss how risk can be hedged by using options, futures and forward contracts, and swaps.

7.4.1 Risk Hedging with Options

An **option** is a right to buy or sell an asset at a specified exercise price at a specified period of time. Option is a right and does not constitute any obligation on the part of the buyer or seller of the option to buy or sell the underlying asset.

A foreign currency option is a handy method of reducing foreign exchange risk. Similarly, options on interest rates and commodities are quite popular with managers to reduce risk. Many options trade on option exchanges. However, in practice, banks and companies strike private option deals.

How does option help reducing risk of a company? Consider an example. Suppose Indian Oil Company (IOC) imports thousands of barrels of oil. The company is expecting increase in the price of oil. The company can lock in the price of oil by purchasing an option to buy oil at a predetermined future date at a specified exercise price. For example, it could acquire 3-month option to buy 3,000 barrels of oil at an exercise price of \$50. There is no free lunch; IOC will have to pay **option premium** to the seller of the option. Assume that this premium is \$0.60 per barrel. By incurring a small cost (option premium), IOC has bought an insurance against increase in the oil price.

Suppose the oil price at the time of option expiry is \$52 per barrel. Since the oil price is higher than the exercise price of \$50, IOC will gain by exercising the option. It will be able to buy oil at \$50 while the actual price (called spot price) is \$52. In practice, firms may collect the difference between the exercise price and the oil price. Since IOC paid a premium to acquire the option, its net payoff is:

$$\begin{aligned}\text{Net pay-off} &= (52 - 50) \times 3,000 - 0.60 \times 3,000 \\ &= 6,000 - 1,800 = \$4,200\end{aligned}$$

The cost of oil to IOC is: $50 \times 3,000 = \$1,50,000$. Thus, the net cost to the company is: $1,50,000 - 4,200 = \$1,45,800$.

On the other hand, if the oil price is below the exercise price, IOC will let the option expire as it is worthless for the company. If the oil price is \$49, it is in IOC's interest to buy oil from the market at \$49 spot price rather than pay an exercise price of \$50. Thus, the cost of oil to the company is: $49 \times 3,000 = \$1,47,000$. IOC has a net loss from option in the form of option premium: $0.60 \times 3,000 = \$1,800$. The net cost to the company is: $1,47,000 + 1,800 = \$1,48,800$.

We may observe from this example that buying an option shields a company from increases in the prices while the company can continue benefiting from the decrease in the prices. Thus, option creates an opportunity to guard against risk and benefit from changes in the prices. The cost of this opportunity is option premium.

Let us consider another example. Suppose ONGC sells oil to Indian Petrochemical Limited (IPCL). ONGC wants to protect itself from a potential fall in oil prices. What

NOTES

NOTES

should it do? It should buy a put option—a right to sell oil at a specified exercise price at a specified time. ONGC will be able to protect itself from falling prices and at the same time benefit from increase in the oil prices. Suppose ONGC buys the put option with the ₹ 25,000 exercise price at a premium of ₹ 50 per barrel. If the price of oil on the day option expires is less than the exercise price, ONGC will exercise the option since it will fetch the locked in price of ₹ 25,000 per barrel. On the other hand, if the oil price is more than the exercise price, it will allow the option to lapse as it can get sell the oil at a higher price. In both situations there is a cost in the form of option premium involved.

Illustration 7.2: Hedging with Options

A goldsmith from Surat plans to import 1,000 troy ounces of gold in three months. He suspects fluctuations in the gold prices. The price could be \$320, \$340 or \$360 an ounce. The goldsmith is thinking of buying a 3-month call option on 1,000 ounces of gold with an exercise price of \$340. The option will cost \$4 per ounce. What is the total cost to the goldsmith under different gold prices?

The goldsmith would exercise the call option when the gold price is more than the exercise price, otherwise he would allow it to lapse. When the gold price is higher than the exercise price, the goldsmith's payoff will be the difference between the gold price and the exercise price. The total cost to the gold smith is as follows:

	Gold Price, Dollar per ounce		
	\$320	\$340	\$360
Cost of 1,000 ounces	3,20,000	3,40,000	3,60,000
Less: Pay-off on call option	0	0	20,000
Plus: option premium	4,000	4,000	4,000
	3,24,000	3,44,000	3,44,000

Forward Contracts

We do frequently enter into arrangements or under-standing now for buying or selling items in the future. These arrangements, when formalized, are referred to as **forward contracts**. Let us clarify further with the help of an example. Suppose you have been admitted to a post-graduate management programme of one of the prestigious management institutes in India. To cope with the academic workload and, particularly, to do assignments in finance and quantitative courses, you intend to buy a desktop computer. You approach a computer dealer on 1 July. When you go to the computer shop, you find that the computer make of your choice is not available for immediate delivery. The shopkeeper offers to deliver the computer of your choice to you after 15 days (15 July) for ₹ 30,000. He also states that if you don't accept the offer, and if you want to buy the computer after 15 days, you will have to pay the actual or the **spot price** on that day which could be more than ₹ 30,000. You agree to the shopkeeper's offer. In fact, you have entered into a forward contract with the shopkeeper. You are under an obligation to buy the computer and pay to the shopkeeper ₹ 30,000 after 15 days and the shopkeeper is obliged to deliver the computer to you. As you agree to buy the computer, you are buying a forward contract. You will be **taking delivery** of the computer, called **deliverable instrument**, on the due date. The shopkeeper, by handing over the computer to you, will be **making delivery** to you. Table 7.2 illustrates the forward contract vis-à-vis your computer deal.

Table 7.2 Example of Forward Contract for Computer Purchase

1 July 2009	15 July 2009
Buyer of Forward Contract	Buyer of Forward Contract
1. Agrees to pay price of ₹ 30,000	1. Makes payment of ₹ 30,000
2. Agrees to take delivery of computer on agreed (15 July)	2. Takes delivery of computer due date
Seller of Forward Contract	Seller of Forward Contract
1. Agrees to make delivery of computer on agreed due date (15 July)	1. Makes delivery of computer
2. Agrees to receive purchase price of ₹ 30,000 on agreed due date (15 July)	2. Receives payment of ₹ 30,000

NOTES

After 15 days, when you take delivery of the computer, you discover that the actual price of the computer, called **spot price**, is ₹ 31,000. You have a gain of ₹ 1,000 since you shall pay ₹ 1,000 less than the current price. Forward contract is a very simple tool of hedging risk. A **forward contract** is an agreement between two parties to exchange an asset for cash at a predetermined future date for a price that is specified today.

Suppose that when you approach the shopkeeper for buying a computer, he has it for immediate delivery. You will pay him the cash and take the delivery. This is a **cash transaction** where the exchange takes place immediately. Forward contracts must be differentiated from the cash transactions.

You would notice that a forward contract is similar to an option in hedging risk, but there is a significant difference. In case of a forward contract, both the buyer and the seller are bound by the contract; the buyer must take the delivery and the seller must make the delivery at the agreed price on the specified due date. Under an option, the buyer has a right to decide whether or not she would exercise the option.

Forward contracts are flexible. They are tailor-made to suit the needs of the buyers and sellers. You can enter into a forward contract for any goods, commodities or assets. You can choose your delivery date for any quantity of goods or commodities. For example, you need a small quantity of gold, say, two troy ounce, after 45 days. You can fix the price of two troy ounce of gold today by an agreement with a gold supplier forward. After 45 days, you will take the delivery of gold by paying the agreed price. There should always be willing buyers and sellers for entering into a forward contract. Though forward contracts are entered into for different goods, commodities or assets, etc., but the foreign currencies forwards have the largest trading.

Illustration 7.3: Hedging through Forward Contract

An Indian company has ordered machinery from USA. The price of \$5,00,000 is payable after six months. The current exchange rate is ₹ 45.75/\$. At the current exchange rate, the company would need: $45.75 \times 5,00,000 = ₹ 22,875,000$. But the company anticipates depreciation of Indian rupee over time. The cost to the company in Indian rupees will increase if rupee depreciates when payment is made after six months. What should the company do? The company can lock in the exchange rate by entering into a forward contract and forget about any fluctuation in the exchange rate. Suppose the six-month forward exchange rate is ₹ 45.95. The company can buy dollars forward. At the time of making payment, it will exchange ₹ 22,975,000 for buying \$5,00,000.

NOTES

Futures Contracts

Suppose a farmer produces barley. He is expecting to have an excellent yield of barley; but he is worried. He is concerned about the future prices of barley. The farmer fears fall in the barley prices in the future. How can he protect himself from the potential of falling price of barley? The farmer supplies barley to a breakfast cereal manufacturer. The farmer can reduce his risk exposure and worries if he could lock in the barley price today. He can do so by entering into a contract today with the manufacturer who wants to buy barley for delivery in the future. The farmer agrees today to sell barley to the manufacturer at a specified future date at a price agreed upon today. The manufacturer is in a different position from the farmer; he is worried that the barley price might increase in the future. He can fix the barley price ahead of time, and take delivery in the future. He would agree to buy barley at a predetermined price on a specified due date.

In fact, the manufacturer and the farmer have entered into a **futures contract**. The farmer will deliver barley to the manufacturer in the future and receive the agreed price, and the manufacturer will take delivery of barley and pay to the farmer. What are the consequences of doing so? First, there is no exchange of money when the contract is entered. The barley farmer agrees to sell barley on a specified future date at a price agreed upon today. The miller agrees to buy at the same price and on the same due date. Second, the contract is binding on both the parties. The barley farmer must sell the barley and the miller must buy irrespective of the actual price in the future.

You may be wondering that futures contracts are like forward contracts. It is true that future contracts are no different from forward contracts as they serve the same purpose and operate through a contract between counterparties. The difference is in terms of standardization and method of operation. Futures contracts have standardized contract size and they trade only on the organized exchanges. Thus, future contracts are forwards contracts traded on organized exchanges in standardized contract size. For example, the standard contract size for barley in the barley international exchange is 20 metric ton. You can enter into barley futures contracts for 20 metric ton or its multiples. If your requirement is less than 20 metric ton, then you should enter into a forward contract as it can be custom made for your specific requirement.

Both the farmer and the manufacturer have hedged risk and both have less risk than before. The farmer has protected himself against risk by selling barley futures; his action is called a **short hedge**. The short hedge is a common occurrence in business, and it takes place whenever a firm or an individual is holding goods or commodities (or any other asset) or is expecting to receive goods or commodities. Farmers anticipate receiving commodities from harvesting agriculture commodities. A producer of petrochemical products may carry inventory of oil. In our example, the manufacturer has protected himself against risk by buying barley futures; his action is referred to as a **long hedge**. Generally, a long hedge occurs when a person or the firm is committed to buy at a fixed price.

Like options, one could use futures contracts to hedge risk. But, as with forward contract and option, there is a difference between these two instruments as well. Unlike options but like forward contracts, future contracts are obligations; on the due date the seller (farmer) has to deliver barley to the buyer (miller) and the buyer will pay the seller the agreed price.

NOTES

In the futures contracts, like in the forward contracts, one party would lose and another will gain. The profit and loss will depend on the agreed futures price and the actual spot at the time of contract maturity. Suppose the futures price of barley is ₹ 20,000 per metric ton and the market price turns out to be ₹ 21,500 per metric ton on the due date. The barley farmer will receive ₹ 1,500 per metric ton less. His loss is the miller's gain; he will pay ₹ 1,500 per metric ton less. Thus, the seller of the contract gains when the contracted price is more than the actual market price later on. The buyer of the contract will gain when the contracted price is less than the actual market price.

Both the barley farmer and the miller are able to hedge their risk. The farmer has locked in the selling price and the miller has locked in the buying price. Both can concentrate on their operations, instead of worrying about the fluctuations in the barley price.

Illustration 7.4: Hedging with Futures

A coal mining company is concerned about short-term volatility in its revenues. Coal currently sells for ₹ 7,000 per ton. But the price could fall as low as ₹ 6,500 per ton or as high as ₹ 7,400 per ton. The company will supply about 5,000 tons to the market next month. What are the consequences if the company does not hedge? What is the cost to the company if it enters into a futures contract to deliver 5,000 tons of coal at an agreed price of ₹ 7,050 per ton next month?

If the company does not hedge risk, it will not know what the selling price will be after one month and its revenues will depend on the actual price after one month. If the company hedges through the coal futures, it will lock in the selling price which in the present case is ₹ 7,050 per ton. Thus, the company's position will be as shown below:

Hedging Risk			
Futures price	7,050	7,050	7,050
Spot price	7,400	7,000	6,500
Profit/loss	-350	+50	+550

Financial Futures

Futures are traded in a wide variety of commodities: wheat, sugar, gold, silver, copper, oranges, coco, oil soybean, etc. Commodity prices fluctuate far and wide. For large buyers of a commodity whose prices swing downward and upward, there are significant cost implications. These companies reduce their risk of upward movements in prices by hedging with commodity futures.

There are firms which do not have commodity prices exposure but they have significant exposure of interest rates and exchange rates fluctuations. These firms can hedge their exposure through financial futures. **Financial futures**, like the commodity futures, are contracts to buy or sell financial assets at a future date at a specified price. Financial futures, introduced for the first time in 1972 in USA, have become very popular. Now the trading in financial futures far exceeds trading in commodity futures.

Futures Contracts vs. Forward Contracts

Futures contracts originated for hedging risk of agricultural commodities and later on many more commodities were covered under futures contracts. In terms of the basic nature, forward contracts and futures contracts are same. But in the operating terms there are the following differences.

Table 7.3 Examples of Listed Futures Contracts

<i>Contract</i>	<i>Contract size</i>	<i>Exchange</i>
Corn	5,000 bushels	CBT
Soybeans	5,000 bushels	CBT
Wheat	5,000 bushels	KC
Barley	20 metric ton	WPG
Rye	21 metric ton	WPG
Pork bellies	40,000 lbs	CME
Cotton	50,000 lbs	CTN
Orange juice	15,000 lbs.	CTN
Sugar (world)	1,12,000 lbs.	CSCE
Coffee	37,500 lbs.	CSCE
Gold	100 troy oz.	CMX
Crude oil (light sweet)	1,000 barrels	NYM
Eurodollar	\$1 million	LIFFE
German Mark	1,25,000 marks	IMM
Treasury bonds	\$1,00,000	CBT
Treasury notes	\$1,00,000	CBT
S&P Index	500 times Index	CME
NYSE Composite	501 times Index	NYFE
Major Market Index	250 times Index	CBT

CBT = Chicago Board of Trade
 KC = Kansas City
 WPG = Winnipeg
 CME = Chicago Mercantile Exchange
 CTN = New Cotton Exchange
 CSCE = Coffee, Sugar, and Cocoa Exchange
 CMX = Commodity Exchange in New York
 NYM = New York Mercantile
 IMM = International Monetary Market in Chicago
 LIFFE = London International Financial Futures Exchange
 NYFE = New York Futures Exchange

Organized futures exchanges: Forward contracts are contracts between two parties, called the **counterparties** and they are not traded on any exchange. Future contracts are traded in the organized future exchanges. As stated earlier, futures contracts are forward contracts traded on the futures exchanges. The Chicago Board of Trade is the largest futures exchange. Other exchanges include Commodity Exchange in New York, International Monetary Market in Chicago, London International Financial Futures Exchange, etc., In a futures exchange the delivery dates are specified, but there is choice of delivery dates. The futures prices would be higher as the delivery date extends. For example, the December 2004 futures contract will have a higher price than, say, the October 2004 futures contract.

Standardized contracts: Futures contracts are standar-dized contracts in terms of the amount or quantity as well as the quality of the product. The seller of the futures contract

NOTES

will have to deliver goods or commodities of a specified quality. Forward contracts are non-standard. They are custom-made depending on the requirements of the counterparties. Table 7.3 gives examples of futures contracts in certain commodities, products and financial instruments, contract size and the exchange where these futures contracts are traded. For example, you may notice that if you want to enter into a barley futures contract, the minimum size of the contract is 20 metric ton.

Margin: The buyers and sellers of the futures contracts are required to deposit some cash or securities as margin. This is done to ensure that the buyers and sellers honour the deal. In case of forward contracts, there is no formal requirement of margin.

Marked to market: This is a significant difference between forward contracts and futures contracts. Forward contracts are settled on the due date. But in the case of futures contracts, there is daily closing and reopening of the position which is called **marked to market**. Consider an example to understand the meaning of marked to market. Suppose you have a futures contract to deliver 1,000 troy ounces of gold at \$300 per troy ounce. Assume that the price of the gold futures next day is \$305 per troy ounce of gold. You have a loss on your sales of 1,000 troy ounces of gold: $1,000 (305 - 300) = \$5,000$. You will be required to pay this amount to the futures exchange. After the first day your loss is \$5 per troy ounce and now your obligation is to deliver gold at \$305 per troy ounce. This is like buying back your future position each day and then entering into a new futures contract. The buyer of the gold has a reverse position. He makes a profit of \$5 due to increase in the futures price. He will receive this profit from the exchange. On the part of the buyer of gold, this is like selling back the futures position each day and then entering into a new futures contract. This is referred to marked to market. Marked to market means that profit and loss on a futures contract are calculated each day, and if there is a profit, you receive profit from the exchange but if there is a loss, you pay loss to the exchange.

Delivery: A seller of the futures contract may wait for the contract to mature and then make the delivery. In practice, the seller of the futures contracts buys back the futures just before delivery. Most forward contracts are made to give and take delivery.

Futures and Spot Prices of Financial Futures

The price of a commodity or financial asset for immediate delivery is known as the **spot price**. The futures price and spot price today will not be the same. Let us first explain the futures and spot prices of a financial asset. The difference in the prices will be on account of the financial cost and dividend or interest associated with a financial security. Suppose a person owns a share that he can sell immediately for cash or sell at a later date at the futures price. If he sells the financial asset at the spot price immediately instead of selling share futures, he will earn interest on the amount received, but he will have to forgo any dividend on the share that he would have received by holding the asset. Let us consider another example where a person wants to buy a share. He can buy it immediately at spot price, or enter into a futures contract and take delivery in the future at futures price. Under the futures contract, there will be no outgo of cash and the buyer has an opportunity of earning interest on the purchase price. But, since the buyer will not hold the share, he will lose the opportunity of earning dividends (or interest in case of a debt security). Thus, the relationship between the spot and the future prices will be as follows:

NOTES

NOTES

Futures price = Spot price $(1+r_f)^t$ – dividend foregone

$$\text{Spot price} = \frac{\text{Future price}}{(1+r_f)^t} + \frac{\text{Dividend foregone}}{(1+r_f)^t} \quad (1)$$

Alternatively, we can write the following equation:

$$\text{Spot price} - \frac{\text{Dividend foregone}}{(1+r_f)^t} = \frac{\text{Future price}}{(1+r_f)^t} \quad (2)$$

Note that r_f is the risk-free rate of interest. Let us consider an example of the stock index futures.

Stock Index Futures Stock index futures are futures contracts on stock market indices. For example, stock index futures are available on New York Stock Exchange, S&P500, S&P100 and the Major market Index, etc. What is the relationship between the stock index futures and spot prices?

Suppose the stock index is at 2,500. The risk-free interest rate is 6 per cent per annum. The average annual dividend yield is 2 per cent. How much would be the one-year stock index futures?

$$\text{Futures price} = 2,500 (1.06)^1 - 2,500 (0.02)^1 = 2,600$$

Stock index futures, like other futures contracts, are traded in organized exchanges and have standardized size. For example, the S&P500 index has a contract size of \$500 times the index.

On 20 November 2004, a broker is anticipating rise in S&P500 when the December S&P500 futures is at 1,200. The broker purchases one December contract for $1,200 \times \$500 = \$600,000$. The S&P500 index increases to 1,250 by 20 December 2004. The broker decides to sell his contract. How much profit does the broker make?

$$\text{The broker's profit is: } (1,250 - 1,200) \times \$500 = \$125,000.$$

Spot and Future Prices of Commodity Futures: There is a difference between the spot and futures prices of financial assets and commodities. In case of commodity futures, there is no dividend forgone. Further, the buyer of commodity futures does not need to store commodity as delivery will be in the future. Therefore, he avoids storage cost. Also, the buyer does not have commodity in hand which does not give him a comfort or convenience of meeting sudden requirements. Thus, the buyer saves storage cost but loses in terms of **convenience yield**.⁵ The spot and futures prices relationship in case of commodities futures is given as follows:

$$\begin{aligned} \text{Spot price} \\ = \frac{\text{Future price}}{(1+r_f)^t} - \frac{\text{Storage costs}}{(1+r_f)^t} + \frac{\text{Convenience yield}}{(1+r_f)^t} \end{aligned} \quad (3)$$

$$\begin{aligned} \frac{\text{Future price}}{(1+r_f)^t} \\ = \text{Spot price} + \left(\frac{\text{Storage costs}}{(1+r_f)^t} - \frac{\text{Convenience yield}}{(1+r_f)^t} \right) \end{aligned} \quad (4)$$

The difference between the present value storage costs and convenience yield is **net convenience yield** (NCY). In practice, it can be inferred as the difference between the present value of futures price and spot price.

Illustration 7.5: Convenience Yield

Suppose the spot price for wheat was \$2.85 per bushel in September 2004. The one-year futures price was \$3.38 per bushel. The interest rate is 6 per cent. What is the net convenience yield?

$$\frac{3.38}{(1.06)^1} = 2.85 + \text{PV (storage costs - convenience yield)}$$

$$\text{PV (NCY)} = 3.19 - 2.85 = \$ 0.34$$

Trading in the futures contracts runs into billions of dollars each day. Since the futures contracts are traded on the organized exchanges, there is high degree of liquidity. But the futures contracts may not suit the needs of all. The contract size is standardized and the delivery dates are specified in each year. If the futures contracts are not suitable for the needs of a company, it can buy or sell forward contracts.

7.5 LEVEL OF CURRENT AND LIQUID ASSETS

Current Assets to Fixed Assets Ratio

The financial manager should determine the optimum level of current assets so that the wealth of shareholders is maximized. A firm needs fixed and current assets to support a particular level of output. However, to support the same level of output, the firm can have different levels of current assets. As the firm's output and sales increase, the need for current assets increases. Generally, current assets do not increase in direct proportion to output; current assets may increase at a decreasing rate with output. This relationship is based upon the notion that it takes a greater proportional investment in current assets when only a few units of output are produced, than it does later on, when the firm can use its current assets more efficiently.

Exhibit 7.1 Levels of Current Assets: Some Examples of Indian Companies

Current assets form a significant portion of total assets of many Indian companies. Consider the following examples:

	<i>BHEL</i>	<i>GNFC</i>	<i>L&T</i>	<i>Voltas</i>
Sales	7651.1	1476.7	8782.5	1232.3
Total assets (TA)	9600.4	1991.9	17095.9	862.9
Current assets (CA)	8601.0	882.9	11398.4	658.4
CA/TA	89.6	44.3	66.7	76.3
CA/Sales	112.4	59.8	129.8	53.4

Note: Data for the year 2003, except in case of BHEL.

- **Voltas** Voltas is a large, well-diversified, private sector marketing-cum-manufacturing organization. In 2003, the company's current assets are three-fourths of total assets and more than half of sales.

NOTES

Check Your Progress

- What is a derivative?
- Define hedging.
- How are future contracts different from forward contracts?

NOTES

- **L&T Limited** L&T is also a diversified company in the private sector. In 2003, its current assets are two-thirds of total assets and about one and a third times of sales.
- **GNFC** GNFC is a joint sector (joint venture between state of Gujarat and private sector) company manufacturing fertilizers, industrial products (methanol, formic acid, nitric acid, ammonium nitrate, liquid nitrogen etc.) and electronic products. Its current assets in the year 2003 are less than half of total assets and 60 per cent of sales.
- **BHEL** BHEL was started as a large public sector company. Its shares have been partly divested now. It has a dominant position in the power sector. Its manufacturing operations are spread into industrial and transportation sectors also. A large number of its products are long production-cycle products. The company's main customers are State Electricity Boards who fail to pay their due on time. BHEL's current assets in 2002 are 90 per cent of total assets and 112 per cent of sales.

The level of the current assets can be measured by relating current assets to fixed assets. Dividing current assets by fixed assets gives CA/FA ratio. Assuming a constant level of fixed assets, a higher CA/FA ratio indicates a **conservative current assets policy** and a lower CA/FA ratio means an **aggressive current assets policy**, assuming other factors to be constant. A conservative policy implies greater liquidity and lower risk; while an aggressive policy indicates higher risk and poor liquidity. **Moderate Coverage) current assets policy** falls in the middle of conservative and aggressive policies. The current assets policy of the most firms may fall between these two extreme policies. The alternative current assets policies may be shown with the help of Figure 7.5.

In Figure 7.5 alternative A indicates the most conservative policy, where CA/FA ratio is greatest at every level of output. Alternative C is the most aggressive policy, as CA/FA ratio is lowest at all levels of output. Alternative B lies between the conservative and aggressive policies and is an average policy.

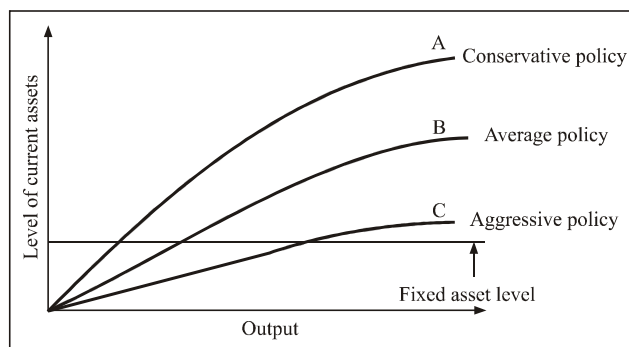


Fig. 7.5 Alternative Current Asset Policies

Liquidity vs Profitability: Risk–Return Trade-off

The firm would make just enough investment in current assets if it were possible to estimate working capital needs exactly. Under perfect certainty, current assets holdings would be at the minimum level. A larger investment in current assets under certainty would mean a low rate of return on investment for the firm, as excess investment in current assets will not earn enough return. A smaller investment in current assets, on the other hand, would mean interrupted production and sales, because of frequent stock-outs and inability to pay to creditors in time due to restrictive policy.

As it is not possible to estimate working capital needs accurately, the firm must decide about levels of current assets to be carried. Given a firm's technology and production policy, sales and demand conditions, operating efficiency etc., its current assets holdings will depend upon its working capital policy. It may follow a conservative or an aggressive policy. These policies involve risk–return trade-offs. A conservative policy means lower return and risk, while an aggressive policy produces higher return and risk.

The two important aims of the working capital management are: *profitability* and *solvency*. **Solvency**, used in the technical sense, refers to the firm's continuous ability to meet maturing obligations. Lenders and creditors expect prompt settlements of their claims as and when due. To ensure solvency, the firm should be very liquid, which means larger current assets holdings. If the firm maintains a relatively large investment in current assets, it will have no difficulty in paying claims of creditors when they become due and will be able to fill all sales orders and ensure smooth production. Thus, a liquid firm has less risk of insolvency; that is, it will hardly experience a cash shortage or a stock-out situation. However, there is a cost associated with maintaining a sound liquidity position. A considerable amount of the firm's funds will be tied up in current assets, and to the extent this investment is idle, the firm's profitability will suffer.

To have higher profitability, the firm may sacrifice solvency and maintain a relatively low level of current assets. When the firm does so, its profitability will improve as fewer funds are tied up in idle current assets, but its solvency would be threatened and would be exposed to greater risk of cash shortage and stock-outs.

Illustration 7.6: Working Capital Risk-return Trade-off

Suppose, a firm has the following data for some future year:

	₹
Sales (100,000 units @ ₹ 15)	1,500,000
Earnings before interest and taxes	150,000
Fixed assets	500,000

The three possible current assets holdings of the firm are: ₹ 5,00,000, ₹ 4,00,000 and ₹ 3,00,000. It is assumed that fixed assets level is constant and profits do not vary with current assets levels. The effect of the three alternative current assets policies is shown in Table 7.4.

Table 7.4 Effect of Alternative Working Capital Policies

Working Capital Policy	Conservative A	Moderate B	Aggressive B
Sales	1,500,000	15,00,000	1,500,000
Earnings before interest & taxes (EBIT)	150,000	150,000	150,000
Current assets	500,000	400,000	300,000
Fixed assets	500,000	500,000	500,000
Total assets	1,000,000	900,000	800,000
Return on total assets (EBIT/Total assets)	15%	16.67%	18.75%
Current assets/Fixed assets	1.00	0.80	0.60

NOTES

NOTES

The calculations in Table 7.4 indicate that alternative A, the most conservative policy, provides greatest liquidity (solvency) to the firm, but also the lowest return on total assets. On the other hand, alternative C, the most aggressive policy, yields highest return but provides lowest liquidity and thus, is very risky to the firm. Alternative B demonstrates a moderate policy and generates a return higher than alternative A but lower than alternative C and is less risky than alternative C but more risky than alternative A.

Illustration 7.6 is a simple example of risk–return trade-off. The calculation of risk–return trade-off is difficult and returns are affected differently by different assets, and generalization is not possible.

7.6 FACTORS AFFECTING THE REQUIREMENT OF WORKING CAPITAL

The firm should maintain a sound working capital position. It should have adequate working capital to run its business operations. Both excessive as well as inadequate working capital positions are dangerous from the firm's point of view. Excessive working capital means holding costs and idle funds which earn no profits for the firm. Paucity of working capital not only impairs the firm's profitability but also results in production interruptions and inefficiencies and sales disruptions.

The dangers of excessive working capital are as follows:⁶

- It results in unnecessary accumulation of inventories. Thus, chances of inventory mishandling, waste, theft and losses increase.
- It is an indication of defective credit policy and slack collection period. Consequently, higher incidence of bad debts results, which adversely affects profits.
- Excessive working capital makes management complacent which degenerates into managerial inefficiency.
- Tendencies of accumulating inventories tend to make speculative profits grow. This may tend to make dividend policy liberal and difficult to cope with in future when the firm is unable to make speculative profits.

Inadequate working capital is also bad and has the following dangers:⁷

- It stagnates growth. It becomes difficult for the firm to undertake profitable projects for non-availability of working capital funds.
- It becomes difficult to implement operating plans and achieve the firm's profit target.
- Operating inefficiencies creep in when it becomes difficult even to meet day-to-day commitments.
- Fixed assets are not efficiently utilised for the lack of working capital funds. Thus, the firm's profitability would deteriorate.
- Paucity of working capital funds render the firm unable to avail attractive credit opportunities etc.
- The firm loses its reputation when it is not in a position to honour its short-term obligations. As a result, the firm faces tight credit terms.

An enlightened management should, therefore, maintain the right amount of working capital on a continuous basis. Only then a proper functioning of business operations will

be ensured. Sound financial and statistical techniques, supported by judgement, should be used to predict the quantum of working capital needed at different time periods.

A firm's net working capital position is not only important as an index of liquidity but it is also used as a measure of the firm's risk. Risk in this regard means chances of the firm being unable to meet its obligations on due date. The lender considers a positive net working capital as a measure of safety. All other things being equal, the more the net working capital a firm has, the less likely that it will default in meeting its current financial obligations. Lenders such as commercial banks insist that the firm should maintain a minimum net working capital position.

7.6.1 Determinants of Working Capital

There are no set rules or formulae to determine the working capital requirements of firms. A large number of factors, each having a different importance, influence working capital needs of firms. The importance of factors also changes for a firm over time. Therefore, an analysis of relevant factors should be made in order to determine total investment in working capital. The following is the description of factors which generally influence the working capital requirements of firms.⁸

Nature of Business

Working capital requirements of a firm are basically influenced by the nature of its business. Trading and financial firms have a very small investment in fixed assets, but require a large sum of money to be invested in working capital. Retail stores, for example, must carry large stocks of a variety of goods to satisfy varied and continuous demands of their customers. A large departmental store like Wal-Mart may carry, say, over 20,000 items. Some manufacturing businesses, such as tobacco manufacturers and construction firms, also have to invest substantially in working capital and a nominal amount in fixed assets. In contrast, public utilities may have limited need for working capital and have to invest abundantly in fixed assets. Their working capital requirements are nominal because they may have only cash sales and supply services, not products. Thus, no funds will be tied up in debtors and stock (inventories). For the working capital requirements most of the manufacturing companies will fall between the two extreme requirements of trading firms and public utilities. Such concerns have to make adequate investment in current assets depending upon the total assets structure and other variables.

Market and Demand Conditions

The working capital needs of a firm are related to its sales. However, it is difficult to precisely determine the relationship between volume of sales and working capital needs. In practice, current assets will have to be employed before growth takes place. It is, therefore, necessary to make advance planning of working capital for a growing firm on a continuous basis.

Growing firms may need to invest funds in fixed assets in order to sustain growing production and sales. This will, in turn, increase investment in current assets to support enlarged scale of operations. Growing firms need funds continuously. They use external sources as well as internal sources to meet increasing needs of funds. These firms face further problems when they retain substantial portion of profits, as they will not be able to pay dividends to shareholders. It is, therefore, imperative that such firms do proper planning to finance their increasing needs for working capital.

NOTES

NOTES

Sales depend on demand conditions. Large number of firms experience seasonal and cyclical fluctuations in the demand for their products and services. These business variations affect the working capital requirement, specially the temporary working capital requirement of the firm. When there is an upward swing in the economy, sales will increase; correspondingly, the firm's investment in inventories and debtors will also increase. Under boom, additional investment in fixed assets may be made by some firms to increase their productive capacity. This act of firms will require further additions of working capital. To meet their requirements of funds for fixed assets and current assets under boom period, firms generally resort to substantial borrowing. On the other hand, when there is a decline in the economy, sales will fall and consequently, levels of inventories and debtors will also fall. Under recession, firms try to reduce their short-term borrowings.

Seasonal fluctuations not only affect working capital requirement but also create production problems for the firm. During periods of peak demand, increasing production may be expensive for the firm. Similarly, it will be more expensive during slack periods when the firm has to sustain its working force and physical facilities without adequate production and sales. A firm may, thus, follow a policy of **level production**, irrespective of seasonal changes in order to utilise its resources to the fullest extent. Such a policy will mean accumulation of inventories during off-season and their quick disposal during the peak season.

The increasing level of inventories during the slack season will require increasing funds to be tied up in the working capital for some months. Unlike cyclical fluctuations, seasonal fluctuations generally conform to a steady pattern. Therefore, financial arrangements for seasonal working capital requirements can be made in advance. However, the financial plan or arrangement should be flexible enough to take care of some abrupt seasonal fluctuations.

Technology and Manufacturing Policy

The **manufacturing cycle** (or the inventory conversion cycle) comprises the purchase and use of raw materials and the production of finished goods. Longer the manufacturing cycle, larger will be the firm's working capital requirements. For example, the manufacturing cycle in the case of a boiler, depending on its size, may range between six to twenty-four months. On the other hand, the manufacturing cycle of products such as detergent powder, soaps, chocolate etc. may be a few hours. An extended manufacturing time span means a larger tie-up of funds in inventories. Thus, if there are alternative technologies of manufacturing a product, the technological process with the shortest manufacturing cycle may be chosen. Once a manufacturing technology has been selected, it should be ensured that manufacturing cycle is completed within the specified period. This needs proper planning and coordination at all levels of activity. Any delay in manufacturing process will result in accumulation of work-in-process and waste of time. In order to minimise their investment in working capital, some firms, specifically those manufacturing industrial products, have a policy of asking for advance payments from their customers. Non-manufacturing firms, service and financial enterprises do not have a manufacturing cycle.

A strategy of level or steady production may be maintained in order to resolve the working capital problems arising due to seasonal changes in the demand for the firm's product. A **steady** or **level production policy** will cause inventories to accumulate during the off-season periods and the firm will be exposed to greater inventory costs and risks. Thus, if costs and risks of maintaining a constant production schedule are high, the

NOTES

firm may adopt a **variable production policy**, varying its production schedules in accordance with changing demand. Those firms, whose productive capacities can be utilised for manufacturing varied products, can have the advantage of diversified activities and solve their working capital problems. They will manufacture the original product line during its increasing demand and when it has an off-season, other products may be manufactured to utilise physical resources and working force. Thus, production policies will differ from firm to firm, depending on the circumstances of individual firm.

Credit Policy

The credit policy of the firm affects the working capital by influencing the level of debtors. The credit terms to be granted to customers may depend upon the norms of the industry to which the firm belongs. But a firm has the flexibility of shaping its credit policy within the constraint of industry norms and practices. The firm should use discretion in granting credit terms to its customers. Depending upon the individual case, different terms may be given to different customers. A **liberal credit policy**, without rating the credit-worthiness of customers, will be detrimental to the firm and will create a problem of collection later on. The firm should be prompt in making collections. A high collection period will mean tie-up of large funds in debtors. Slack collection procedures can increase the chance of bad debts.

In order to ensure that unnecessary funds are not tied up in debtors, the firm should follow a rationalised credit policy based on the credit standing of customers and other relevant factors. The firm should evaluate the credit standing of new customers and periodically review the credit-worthiness of the existing customers. The case of delayed payments should be thoroughly investigated.

Availability of Credit from Suppliers

The working capital requirements of a firm are also affected by credit terms granted by its suppliers. A firm will need less working capital if liberal credit terms are available to it from suppliers. Suppliers' credit finances the firm's inventories and reduces the cash conversion cycle. In the absence of suppliers' credit the firm will have to borrow funds for bank. The availability of credit at reasonable cost from banks is crucial. It influences the working capital policy of a firm. A firm without the suppliers' credit, but which can get bank credit easily on favourable conditions, will be able to finance its inventories and debtors without much difficulty.

Operating Efficiency

The operating efficiency of the firm relates to the optimum utilisation of all its resources at minimum costs. The efficiency in controlling operating costs and utilising fixed and current assets leads to operating efficiency. The use of working capital is improved and pace of cash conversion cycle is accelerated with operating efficiency. Better utilisation of resources improves profitability and, thus, helps in releasing the pressure on working capital. Although it may not be possible for a firm to control prices of materials or wages of labour, it can certainly ensure efficient and effective use of its materials, labour and other resources.

Price Level Changes

The increasing shifts in price level make the functioning of the financial manager difficult. She should anticipate the effect of price level changes on working capital requirements

NOTES

of the firm. Generally, rising price levels will require a firm to maintain higher amount of working capital. Same levels of current assets will need increased investment when prices are increasing. However, companies that can immediately revise their product prices with rising price levels will not face a severe working capital problem. Further, firms will feel effects of increasing general price level differently as prices of individual products move differently. Thus, it is possible that some companies may not be affected by rising prices while others may be badly hit.

7.6.2 Issues in Working Capital Management

Working capital management refers to the administration of all components of working capital—cash, marketable securities, debtors (receivable) and stock (inventories) and creditors (payables). The financial manager must determine *levels* and *composition* of current assets. He must see that right sources are tapped to finance current assets, and that current liabilities are paid in time.

There are many aspects of working capital management which make it an important function of the financial manager:⁹

- **Time** Working capital management requires much of the financial manager's time.
- **Investment** Working capital represents a large portion of the total investment in assets.
- **Criticality** Working capital management has great significance for all firms but it is very critical for small firms.
- **Growth** The need for working capital is directly related to the firm's growth.

Empirical observations show that the financial managers have to spend much of their time to the daily internal operations, relating to current assets and current liabilities of the firms. As the largest portion of the financial manager's valuable time is devoted to working capital problems, it is necessary to manage working capital in the best possible way to get the maximum benefit.

Investment in current assets represents a very significant portion of the total investment in assets. For example, in the case of the large and medium public limited companies in India, current assets constitute about 60 per cent of total assets or total capital employed.¹⁰ In a large company such as Bharat Heavy Electricals Limited (BHEL) current assets as a percentage of total assets may be as high as, say, 90 per cent. (See Exhibit 7.1 for examples of other companies). This clearly indicates that the financial manager should pay special attention to the management of current assets on a continuing basis. Actions should be taken to curtail unnecessary investment in current assets.

Working capital management is critical for all firms, but particularly for small firms. A small firm may not have much investment in fixed assets, but it has to invest in current assets. Small firms in India face a severe problem of collecting their debtors (book debts or receivables). Further, the role of current liabilities in financing current assets is far more significant in case of small firms, as, unlike large firms, they face difficulties in raising long-term finances.

There is a direct relationship between a firm's growth and its working capital needs. As sales grow, the firm needs to invest more in inventories and debtors. These needs become very frequent and fast when sales grow continuously. The financial manager should be aware of such needs and finance them quickly. Continuous growth in sales may also require additional investment in fixed assets.

It may, thus, be concluded that all precautions should be taken for the effective and efficient management of working capital. The finance manager should pay particular attention to the levels of current assets and the financing of current assets. To decide the levels and financing of current assets, the risk–return implications must be evaluated.

The Cost Trade-off

A different way of looking into the risk–return trade-off is in terms of the cost of maintaining a particular level of current assets. There are two types of costs involved: **cost of liquidity** and **cost of illiquidity**. If the firm's level of current assets is very high, it has excessive liquidity. Its return on assets will be low, as funds tied up in idle cash and stocks earn nothing and high levels of debtors reduce profitability. Thus, the cost of liquidity (through low rates of return) increases with the level of current assets.

The cost of illiquidity is the cost of holding insufficient current assets. The firm will not be in a position to honour its obligations if it carries too little cash. This may force the firm to borrow at high rates of interest. This will also adversely affect the credit-worthiness of the firm and it will face difficulties in obtaining funds in the future. All this may force the firm into insolvency. Similarly, the low level of stocks will result in loss of sales and customers may shift to competitors. Also, low level of debtors may be due to tight credit policy, which would impair sales further. Thus, the low level of current assets involves costs that increase as this level falls.

In determining the optimum level of current assets, the firm should balance the profitability–solvency tangle by minimising total costs—cost of liquidity and cost of illiquidity. This is illustrated in Figure 7.6. It is indicated in the figure that with the level of current assets the cost of liquidity increases while the cost of illiquidity decreases and vice versa. The firm should maintain its current assets at that level where the sum of these two costs is minimised. The minimum cost point indicates the optimum level of current assets in Figure 7.6.

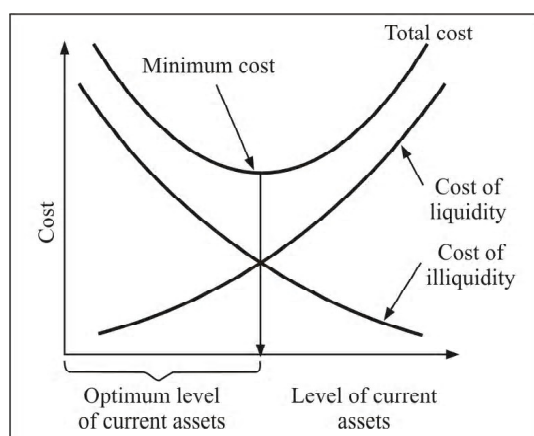


Fig. 7.6 Cost Trade-off

Estimating Working Capital Needs

The most appropriate method of calculating the working capital needs of a firm is the concept of operating cycle. However, a number of other methods may be used to determine working capital needs in practice. We shall illustrate here three approaches which have been successfully applied in practice:

NOTES

NOTES

- **Current assets holding period** To estimate working capital requirements on the basis of average holding period of current assets and relating them to costs based on the company's experience in the previous years. This method is essentially based on the operating cycle concept.
- **Ratio of sales** To estimate working capital requirements as a ratio of sales on the assumption that current assets change with sales.
- **Ratio of fixed investment** To estimate working capital requirements as a percentage of fixed investment.

To illustrate the above methods of estimating working capital requirements and their impact on rate of return we shall take examples of two hypothetical firms (as given in Table 7.5).

Table 7.5 Data for Two Firms

	<i>Firm A</i> ₹	<i>Firm B</i> ₹
Material cost:		
Raw material consumed	248,000	248,000
Less: By-product	68,800	68,800
Net material cost	179,200	179,200
Manufacturing cost		
Labour	171,200	171,200
Maintenance	160,000	160,000
Power and fuel	57,600	57,600
Factory overheads	240,000	240,000
Depreciation	160,000	320,000
Total manufacturing cost	788,800	948,800
Total product cost	968,000	1,128,000
Annual sales	1,448,000	1,448,000
PBIT	480,000	320,000
Investment	1,600,000	3,200,000
Period	1 year	1 year
Plant life	10 year	10 year
PBDIT	640,000	640,000
ROI [PBIT/(investment – depreciation)]	33.3%	11.1%

The calculations are based on the following assumptions regarding each of the three methods:

Method 1: Inventory: one month's supply of each of raw material, semifinished goods and finished material. Debtors: one month's sales. Operating cash: one month's total cost.

Method 2: 25–35% of annual sales.

Method 3: 10–20% of fixed capital investment.

The following calculations based on data of firm A are made to show how three methods work. You may complete calculations for firm B.

Method 1: Current Assets Holding Period

Let us first compute inventory requirements as shown below:

Raw material: one month's supply:

$$₹ 248,000 \div 12 = ₹ 20,667$$

Semi-finished material: one month's supply (based on raw material plus assume one-half of normal conversion cost):

$$\begin{aligned} & ₹ 20,667 + (₹ 171,200 + ₹ 160,000 + ₹ 57,600) 1/2 \div 12 \\ & \quad = ₹ 20,667 + 16,200 = ₹ 36,867 \end{aligned}$$

Finished material: one month's supply:

$$₹ 968,000 \div 12 = ₹ 80,666$$

The total inventory needs are:

$$₹ 20,667 + ₹ 36,867 + ₹ 80,666 = ₹ 138,200$$

After determining the inventory requirements, projection for debtors and operating cash should be made.

Debtors: One month's sales:

$$₹ 1,448,000 \div 12 = ₹ 120,667$$

Operating cash: One month's total cost:

$$₹ 968,000 \div 12 = ₹ 80,667$$

Thus the total working capital required is:

$$₹ 138,200 + ₹ 120,667 + ₹ 80,666 = ₹ 339,533$$

Method 2: Ratio of Sales

The average ratio is 30 per cent. Therefore, 30 per cent of annual sales, ₹ 1,448,000 is ₹ 434,400.

Method 3: Ratio of Fixed Investment

The ratio of current assets to fixed investment ranges between 10 to 20 per cent. We shall use the average rate of 15 per centages. The 15 per cent of fixed investment, ₹ 1,600,000 is ₹ 240,000.

The first method gives details of the working capital items. This approach is subject to error if markets are seasonal. As per the first method the working capital requirement is ₹ 339,533. If this figure is considered in calculating the rate of return, it is lowered from 33.3 per cent to 27 per cent. On the other hand, the return of Firm B drops from 11.1 per cent to 9.9 per cent. The estimated working capital for firm B as per the first method is ₹ 366,200. Rates of return are calculated as follows:

$$\begin{aligned} \text{Rate of return} &= \frac{\text{PBIT}}{\text{Net fixed investment} + \text{Working capital}} \\ \text{Firm A} &= \frac{480,000}{[(1,600,000 - 160,000) + 339,533]} = 27\% \\ \text{Firm B} &= \frac{320,000}{[(3,200,000 - 320,000) + 366,200]} = 9.9\% \end{aligned}$$

You may notice that investments have been taken net of depreciation.

The second method has a limited reliability. Its accuracy is dependent upon the accuracy of sales estimates. The rate of return of Firm A drops to 25.6 per cent and that of Firm B to 9.7 per cent when the working capital computed by this method is incorporated.

Third method relates working capital to investment. If estimate of investment is inaccurate, this method cannot be relied upon. This method is not generally used in practice to estimate working capital needs. The rates of return from Firms A and B are respectively 28.6 per cent and 9.5 per cent when the working capital computed by this method is considered.

NOTES

NOTES

A number of factors will govern the choice of methods of estimating working capital. Factors such as seasonal variations in operations, accuracy of sales forecasts, investment cost and variability in sales price would generally be considered. The production cycle and credit and collection policy of the firm would have an impact on working capital requirements. Therefore, they should be given due weightage in projecting working capital requirements.

Example 7.1. From the following projects of ABC Ltd. for the coming year, you are asked to determine the working capital needs of the company.

Annual Sales: ₹. 15,60,000

Cost of production (including depreciation of ₹. 1,30,000): ₹. 12,50,000

Raw material purchases: ₹. 7,00,000

Opening Stock of raw materials: ₹. 1,50,000

Using stock of raw materials: ₹. 1,30,000

Inventory Norms:

Raw materials: 2 months

Work-in-process: 1/2 month

Finished goods: 1 month

The firm enjoys credit of 1 month on its purchases and also extends credit of 1 month on its supplier. It may be assumed that production is carried out evenly cash balance the year and the minimum cash balance to be maintained is ₹ 50,000.

Solution: Determination of net working capital

(I) Current Assets:	(₹)
Cash Balance	50,000
<i>Inventories:</i>	
Raw materials	
Opening Stock	1,50,000
Add: Purchase	7,00,000
Less: Closing Stock	1,30,000
Annual Consumption	7,20,000
Two months' requirement ($7,20,000 \times 2/12$)	1,20,000
Work-in-process ($7,20,000 \times 1/24$)	46,667
Finished goods ($7,20,000 \times 1/12$)	93,333
Debtors ($7,20,000 \times 1/12$)	93,333
Total Current Assets	4,03,333
(II) Current liabilities:	
Trade creditors ($7,00,000 \times 1/12$)	58,333
(III) Net working capital (I – II)	₹. 3,45,000

Note: Depreciation is excluded from the cost of production.

Example 7.2. Determination of operating cycle from the information provided below, calculate the operating cycle of the manufacturing company in days:

Period Covered:	365 days
Average period of credit allowed by suppliers:	15 days
Average debtors outstanding	₹ 4,50,000
Raw material consumption	₹ 45,00,000
Total production cost	₹ 110,00,000
Total cost of sales	₹ 120,00,000
Sales for the year	₹ 170,00,000
Value of average stock maintained:	
Raw materials	₹ 3,30,000
Work-in-process	₹ 3,60,000
Finished goods	₹ 3,80,000

NOTES

Solution: (Days)

(a) Raw material holding period (365 days × 330/4500)	27
(b) Less creditors payment period	15
(c) Work-in-process holding period (365 days × 380/11000)	13
(d) Finished goods holding period (365 days × 450/17000)	10
Duration of operating cycle	47

Example 7.2. DEF Co. wants to purchase a business and has consulted year. The company wants you to advise them regarding the average amount of working capital. Which will be required in the first year's working.

You are given the following estimates and are instructed to add 10% to your computed figure to allow for contingencies:

Data for the year
(₹ in '000s)

(i) Average amount backed up for stocks:	
Stocks of finished product	6,000
Stocks of stores material, etc.	7,000
(ii) Average credit given:	
Inland sales 4 weeks' credit	3,20,000
Export sales 2 week' credit	90,000
(iii) Lag in payment of wages and other outgoings:	
Wages 1 week	1,80,000
Stock, raw materials etc. 1/2 months	50,000
Rent, royalties, etc. 3 months	5,000
Clerical staff 1/2 month	65,000
Managers 1/2 month	15,000
Miscellaneous expenses 1 month	30,000

(iv) Payment in advance:

Sundry expenses (quarterly) 9,000

The calculations have to be made for the average amount of working capital required.

NOTES

Solution:

Statement to Determine Net Working Capital

Amount (₹ in '000s)

(A) Current Assets

(i) Stocks of finished products 6,000

(ii) Stock of stores, materials, etc. 7,000

(iii) Debtors:

– Inland sales $\left(3,20,000 \times \frac{4}{52}\right)$ 24,615

– Export sales $\left(9,000 \times \frac{2}{52}\right)$ 3,462

(iv) Advance payment for sundry expenses $\left(9,000 \times \frac{1}{4}\right)$ 2,250

Total Investment in current assets 43,327

(B) Current Liabilities

(i) Wages $\left(180,000 \times \frac{1}{52}\right)$ 3,462

(ii) Stock, raw materials, etc. $\left(50,000 \times \frac{1/2}{12}\right)$ 6,250

(iii) Rent, royalties, etc. $(5,000 \times 3/12)$ 1,250

(iv) Clerical staff $\left(50,000 \times \frac{1/2}{12}\right)$ 2,708

(v) Managers $\left(15,000 \times \frac{1/2}{12}\right)$ 625

(vi) Miscellaneous expenses $\left(30,000 \times \frac{1}{12}\right)$ 2,500

Total current liabilities 16,795

(C) Net working Capital:

(i) Current Assets – Current liabilities 26,532

(ii) Add: 10% Contingency Allowance 2,653

Average amount of working capital required 29,185

Check Your Progress

9. What is excessive working capital?
10. What are the dangers of excessive working capital?
11. What does operating efficiency of the firm relates to?

7.7 SUMMARY

- There are two concepts of working capital—gross and net.
 - o Gross working capital
 - o Net working capital
- The gross working capital concept focuses attention on two aspects of current assets management: (1) How to optimise investment in current assets? (2) How should current assets be financed?
- A firm can adopt different financing policies *vis-à-vis* current assets. Three types of financing may be distinguished: Long-term financing, Short-term financing, Spontaneous financing.
- Depending on the mix of short- and long-term financing, the approach followed by a company may be referred to as:
 - o Matching approach
 - o Conservative approach
 - o Aggressive approach
- The term derivatives can simply be understood as those items that do not have their own independent values, rather they have derived values. Derivatives have a significant place in finance and risk management. A derivative is a financial instrument whose pay-off is derived from some other asset which is called an underlying asset.
- The dangers of excessive working capital are as follows:
 - o It results in unnecessary accumulation of inventories. Thus, chances of inventory mishandling, waste, theft and losses increase.
 - o It is an indication of defective credit policy and slack collection period. Consequently, higher incidence of bad debts results, which adversely affects profits.
 - o Excessive working capital makes management complacent which degenerates into managerial inefficiency.
 - o Tendencies of accumulating inventories tend to make speculative profits grow. This may tend to make dividend policy liberal and difficult to cope with in future when the firm is unable to make speculative profits.
- There are many aspects of working capital management which make it an important function of the financial manager:
 - o *Time*: Working capital management requires much of the financial manager's time.
 - o *Investment*: Working capital represents a large portion of the total investment in assets.
 - o *Criticality*: Working capital management has great significance for all firms but it is very critical for small firms.
 - o *Growth*: The need for working capital is directly related to the firm's growth.

NOTES

NOTES

7.8 KEY TERMS

- **Hedging:** Making an investment to reduce the risk of adverse price movements in an asset. Normally, a *hedge* consists of taking an offsetting position in a related security, such as a futures contract.
- **Fixed Assets:** Assets which are purchased for long-term use and are not likely to be converted quickly into cash, such as land, buildings, and equipment.
- **Liquid Assets:** An asset is said to be liquid if it is easy to sell or convert into cash without any loss in its value.
- **Futures Contract:** Futures contract is a contract where both parties agree to buy and sell a particular asset of specific quantity and at a predetermined price.
- **Forward Contract:** A forward contract is a private agreement between two parties giving the buyer an obligation to purchase an asset (and the seller an obligation to sell an asset) at a set price at a future point in time.

7.9 ANSWERS TO ‘CHECK YOUR PROGRESS’

1. Gross working capital refers to the firm's total investment in current assets, while net working capital is the difference between current assets and current liabilities. The difference between current assets and current liabilities has to be financed by the firm either from long term funds or short-term bank borrowings.
2. First, the management should realise that the level of current assets should not be either excessive or inadequate. Excessive investment in working capital assets ties up funds and reduces the firm's profitability, while inadequate investment threatens solvency of the firm as the firm may not be able to meet current obligations.
3. Net working capital is the difference between current assets and current liabilities (including short-term bank borrowings). The difference is financed by permanent sources of funds. This difference constitutes a margin or buffer for maturing obligations within the operating cycle of the business. The net working capital concept also points to the fact that working capital should be financed by a judicious mix of long-term and short-term funds.
4. The main long-term sources include ordinary and preference share capital, debentures, long term borrowings from banks and financial institutions and retained earnings. The main short-term financing sources include working capital funds from banks, money market instruments like commercial paper, public deposits and factoring of receivables. Spontaneous financing represented by trade credit and outstanding expenses also support the financing of current assets.
5. There is no set formula for deciding the break-up. The 'matching approach' suggests that long term financing be used to finance fixed assets and permanent current assets, while short-term financing should be used to finance temporary or variable current assets. Overall, a firm in practice adopts a conservative approach in financing its current and fixed assets when it depends more on long-term funds for financing needs. On the other hand, an aggressive policy would be implied when a firm uses more short-term financing than suggested by the matching plan. Usually, short-term financing is more risky but less expensive than long-term financing, and hence there is a risk-return trade-off.

6. A derivative is a financial instrument whose pay-off is derived from some other asset which is called an underlying asset.
7. Hedging is a term used for reducing risk by using derivatives.
8. Although future contracts are similar to forward contracts as they serve the same purpose and operate through a contract between counterparties. The difference is in terms of standardization and method of operation. Futures contracts have standardized contract size and they trade only on the organized exchanges. Thus, future contracts are forward contracts traded on organized exchanges in standardized contract size.
9. Excessive working capital means holding costs and idle funds which earn no profits for the firm.
10. The dangers of excessive working capital are as follows:
 - It results in unnecessary accumulation of inventories. Thus, chances of inventory mishandling, waste, theft and losses increase.
 - It is an indication of defective credit policy and slack collection period. Consequently, higher incidence of bad debts results, which adversely affects profits.
 - Excessive working capital makes management complacent which degenerates into managerial inefficiency.
 - Tendencies of accumulating inventories tend to make speculative profits grow. This may tend to make dividend policy liberal and difficult to cope with in future when the firm is unable to make speculative profits.
11. The operating efficiency of the firm relates to the optimum utilization of all its resources at minimum costs.

NOTES

7.10 QUESTIONS AND EXERCISES

Short-Answer Questions

1. What are the two concept of working capital?
2. What are the three types of financing?
3. What are the advantages of better risk management through hedging?
4. Write a short note differentiating between futures contracts and forward contracts.
5. What do you understand by operating efficiency?
6. What is the importance of working capital for a manufacturing firm?

Long-Answer Questions

1. Discuss in detail the three approaches of financing current assets.
2. What are the factors affecting the requirement of working capital?
3. What are the determinants of working capital?
4. What are the issues in working capital management?
5. What are the methods of estimating working capital needs?
6. How is working capital affected by (a) sales, (b) technology and production policy, and (c) inflation? Explain.

7.11 FURTHER READING

NOTES

Pandey, IM. 2009. *Financial Management*. India: Vikas Publishing Pvt Ltd.

Kuchal, SC. 1999. *Financial Management: An Analytical and Conceptual Approach*. India: Chaitanya Publishing house.

Horne Van, C. James. 2001. *Financial Management and Policy*. New Delhi: Prentice Hall.

Endnotes

1. Weston and Brigham, *op. cit.*, p. 510.
2. *Ibid.*, p. 511.
3. *Ibid.*
4. Also see Western and Brigham, *op. cit.*, pp. 512–13.
5. Brealey, Richard A. and Stewart C. Myers, *Principles of Corporate Finance*, New York, Irwin McGraw-Hill, sixth edition, 2000, pp. 767–68.
6. Also see, Ramamoorthy, V.E., *Working Capital Management*, IFMR, Chennai, 1976, p. 11.
7. *Ibid.*, p. 11.
8. *Ibid.*, pp. 51–63.
9. Weston, J. Fred and Eugene F. Brigham, *Managerial Finance*, Illinois: Dryden Press, 1975, pp. 123–24.
10. Reserve Bank of India, Finance of Medium and Large Public Limited Companies, various issues of *Reserve Bank of India Bulletin*.

UNIT 8 MANAGEMENT OF CASH AND MARKETABLE SECURITIES

*Management of Cash and
Marketable Securities*

NOTES

Structure

- 8.0 Introduction
- 8.1 Unit Objectives
- 8.2 Motives for Holding Cash
- 8.3 Ways of Controlling Cash In-flow and Outflow
- 8.4 Summary
- 8.5 Key Terms
- 8.6 Answers to 'Check Your Progress'
- 8.7 Questions and Exercises
- 8.8 Further Reading

8.0 INTRODUCTION

The large holding of current assets, especially cash, strengthens the firm's liquidity position (and reduces riskiness), as well as reduces the overall profitability. Thus, a risk-return trade-off is involved in holding current assets. The levels of fixed as well as current assets depend upon expected sales but it is only current assets which can be adjusted with sales fluctuations in the short run. Thus, the firm has a greater degree of flexibility in managing current assets.

8.1 UNIT OBJECTIVES

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

- Explain the motives for holding cash
- Discuss the ways of controlling cash in-flow and outflow

8.2 MOTIVES FOR HOLDING CASH

The firm's need to hold cash may be attributed to the following three motives:¹

- 1. Transaction motive:** The transactions motive requires a firm to hold cash to conduct its business in the ordinary course. The firm needs cash primarily to make payments for purchases, wages and salaries, other operating expenses, taxes, dividends. The need to hold cash would not arise if there were perfect synchronization between cash receipts and cash payments, i.e., enough cash is received when the payment has to be made. But cash receipts and payments are not perfectly synchronized. For those periods, when cash payments exceed cash receipts, the firm should maintain some cash balance to be able to make required payments. For transactions purpose, a firm may invest its cash in marketable securities. Usually, the firm will purchase securities whose maturity corresponds with some anticipated payments, such as dividends, or taxes in the future. Notice

NOTES

that the transactions motive mainly refers to holding cash to meet anticipated payments whose timing is not perfectly matched with cash receipts.

2. **Precautionary motive:** The precautionary motive is the need to hold cash to meet contingencies in the future. It provides a cushion or buffer to withstand some unexpected emergency. The precautionary amount of cash depends upon the predictability of cash flows. If cash flows can be predicted with accuracy, less cash will be maintained for an emergency. The amount of precautionary cash is also influenced by the firm's ability to borrow at short notice when the need arises. Stronger the ability of the firm to borrow at short notice, less the need for precautionary balance. The precautionary balance may be kept in cash and marketable securities. Marketable securities play an important role here. The amount of cash set aside for precautionary reasons is not expected to earn anything; therefore, the firm should attempt to earn some profit on it. Such funds should be invested in high-liquid and low-risk marketable securities. Precautionary balance should, thus, be held more in marketable securities and relatively less in cash.
3. **Speculative motive:** The speculative motive relates to the holding of cash for investing in profit-making opportunities as and when they arise. The opportunity to make profit may arise when the security prices change. The firm will hold cash, when it is expected that interest rates will rise and security prices will fall. Securities can be purchased when the interest rate is expected to fall; the firm will benefit by the subsequent fall in interest rates and increase in security prices. The firm may also speculate on materials' prices. If it is expected that materials' prices will fall, the firm can postpone materials' purchasing and make purchases in future when price actually falls. Some firms may hold cash for speculative purposes. By and large, business firms do not engage in speculations. Thus, the primary motives to hold cash and marketable securities are: the transactions and the precautionary motives.

8.3 WAYS OF CONTROLLING CASH IN-FLOW AND OUTFLOW

Cash is the most important current asset for the operations of any firm. It is the basic input needed to keep the business running and is also the ultimate output expected to be realized by selling the service or product manufactured by the firm. The firm should keep a sufficient amount of cash at all times. Cash shortage will disrupt the firm's manufacturing operations while excessive cash will simply remain idle, without contributing anything towards the firm's profitability. Hence, a major function of the financial manager is to maintain a sound cash position.

Cash is the money which a firm can disburse immediately without any restriction. It includes coins, currency and cheques held by the firm and balances in its bank accounts. At certain times, near-cash items (like marketable securities or bank time deposits) are also included in the term cash. The basic characteristic of near-cash assets is that they can readily be converted into cash. Generally, when a firm has excess cash, it invests it in marketable securities. This kind of investment contributes some profit to the firm.

Facets of Cash Management

Cash management is concerned with the managing of — (i) cash flows into and out of the firm (ii) cash flows within the firm and (iii) cash balances held by the firm at a point

of time by financing deficit or investing surplus cash. It can be represented by a **cash management cycle** as shown in Figure 8.1.

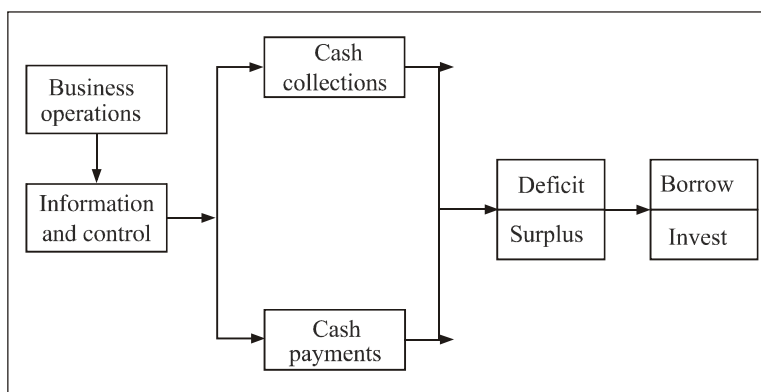


Fig. 8.1 Cash Management Cycle

Management of cash is also important as it is difficult to predict cash flows accurately, particularly the inflows and there is no perfect agreement between the inflows and outflows of cash. Sometimes, cash outflows will exceed cash inflows (as payments for taxes, dividends or seasonal inventory build up) while at other times, cash inflow will be more than cash payments (as there may be large cash sales and debtors may be realized in large sums promptly). Management of cash is also critical since cash constitutes the smallest portion of the total current assets, yet the management's precious time is devoted in managing it. A lot of innovations have been done in cash management techniques, recently. An obvious aim of the firm these days is to manage its cash affairs in such a way as to keep cash balance at a minimum level and to invest the surplus cash in profitable investment opportunities.

A firm should chart out strategies concerning the facets of cash management which are as follows:

- **Cash planning:** Cash inflows and outflows must be drawn out to project cash surplus or deficit for each part of the planning period and for this purpose, a cash budget must be prepared.
- **Managing the cash flows:** The management of a firm should ensure the proper and uninterrupted flow of cash. The cash inflows should be accelerated while, as far as possible, the cash outflows should be slowed down.
- **Optimum cash level:** The firm must take a decision regarding the suitable level of cash balances. The cost of excess cash and danger of cash deficiency needs to be compared to figure out the appropriate level of cash balances. The firm should decide about the division of such cash balance between alternative short-term investment opportunities such as bank deposits, marketable securities or inter-corporate lending.

The ideal cash management system will depend on the firm's products, organization structure, competition, culture and options available. The task is complex, and decisions taken can affect important areas of the firm. For example, to improve collections if the credit period is reduced, it may affect sales. However, in certain cases, even without fundamental changes, it is possible to significantly reduce cost of cash management system by choosing a right bank and controlling the collections properly.

NOTES

Check Your Progress

1. List the three motives which may be attributed to a firm's need to hold cash.
2. Define cash.
3. What does cash management consist of?

NOTES

8.4 SUMMARY

- The firm's need to hold cash may be attributed to the following three motives—transaction motive, precautionary motive and speculative motive.
- The transactions motive requires a firm to hold cash to conduct its business in the ordinary course.
- The firm needs cash primarily to make payments for purchases, wages and salaries, other operating expenses, taxes, dividends.
- The precautionary motive is the need to hold cash to meet contingencies in the future. It provides a cushion or buffer to withstand some unexpected emergency.
- The speculative motive relates to the holding of cash for investing in profit-making opportunities as and when they arise. The opportunity to make profit may arise when the security prices change.
- Cash is the most important current asset for the operations of any firm. It is the basic input needed to keep the business running and is also the ultimate output expected to be realized by selling the service or product manufactured by the firm.
- Cash shortage will disrupt the firm's manufacturing operations while excessive cash will simply remain idle, without contributing anything towards the firm's profitability.
- Cash is the money which a firm can disburse immediately without any restriction. It includes coins, currency and cheques held by the firm and balances in its bank accounts.
- Cash management is concerned with the managing of: (i) cash flows into and out of the firm (ii) cash flows within the firm and (iii) cash balances held by the firm at a point of time by financing deficit or investing surplus cash.
- Management of cash is also important as it is difficult to predict cash flows accurately, particularly the inflows and there is no perfect agreement between the inflows and outflows of cash.
- Management of cash is also critical since cash constitutes the smallest portion of the total current assets, yet the management's precious time is devoted in managing it.
- The ideal cash management system will depend on the firm's products, organization structure, competition, culture and options available.

8.5 KEY TERMS

- **Cash:** Cash is the money which a firm can disburse immediately without any restriction. It includes coins, currency and cheques held by the firm and balances in its bank accounts.
- **Cash management:** Cash management is concerned with the managing of: (i) cash flows into and out of the firm (ii) cash flows within the firm and (iii) cash balances held by the firm at a point of time by financing deficit or investing surplus cash.

8.6 ANSWERS TO ‘CHECK YOUR PROGRESS’

1. The three motives that may be attributed to a firm’s need to hold cash are—transaction motive, precautionary motive and speculative motive.
2. Cash is the money which a firm can disburse immediately without any restriction. It includes coins, currency and cheques held by the firm and balances in its bank accounts.
3. Cash management is concerned with the managing of: (i) cash flows into and out of the firm (ii) cash flows within the firm and (iii) cash balances held by the firm at a point of time by financing deficit or investing surplus cash.

NOTES

8.7 QUESTIONS AND EXERCISES

Short-Answer Questions

1. State the importance of cash.
2. Why is management of cash important?
3. What are the strategies of cash management which a firm should follow?

Long-Answer Questions

1. Discuss in detail the three motives which are attributed to a firm’s need to hold cash.
2. Explain the various ways of controlling cash-inflow and outflow.

8.8 FURTHER READING

Pandey, IM. 2009. *Financial Management*. India: Vikas Publishing Pvt Ltd.

Kuchal, SC. 1999. *Financial Management: An Analytical and Conceptual Approach*. India: Chaitanya Publishing house.

Horne Van, C. James. 2001. *Financial Management and Policy*. New Delhi: Prentice Hall.

Endnote

1. Pogue, G.A., Faucett, R.B. and Bussard, R.N., Cash Management: A Systems Approach, *Industrial Management Review*, (Feb. 1970), pp. 55–74.

UNIT 9 MANAGEMENT OF ACCOUNTS RECEIVABLE

Management of
Accounts Receivable

NOTES

Structure

- 9.0 Introduction
- 9.1 Unit Objectives
- 9.2 Credit Policy: Nature and Goals
 - 9.2.1 Goals of Credit Policy
- 9.3 Optimum Credit Policy: A Marginal Cost–Benefit Analysis
- 9.4 Credit Policy Variables
 - 9.4.1 Credit Standards; 9.4.2 Credit-Granting Decision
 - 9.4.3 Collection Policy and Procedures
- 9.5 Credit Evaluation of Individual Accounts
 - 9.5.1 Credit Information; 9.5.2 Credit Investigation and Analysis
 - 9.5.3 Credit Limit; 9.5.4 Collection Efforts
- 9.6 Monitoring Receivables
- 9.7 Factoring
 - 9.7.1 Nature of Factoring; 9.7.2 Factoring Services
 - 9.7.3 Types of Factoring; 9.7.4 Costs and Benefits of Factoring
- 9.8 Summary
- 9.9 Key Terms
- 9.10 Answers to ‘Check Your Progress’
- 9.11 Questions and Exercises
- 9.12 Further Reading

9.0 INTRODUCTION

Trade credit happens when a firm sells its products or services on credit and does not receive cash immediately. It is an essential marketing tool, acting as a bridge for the movement of goods through the production and distribution stages to customers. A firm grants trade credit to protect its sales from the competitors and to attract the potential customers to buy its products at favourable terms. Trade credit creates **accounts receivable** or **trade debtors** (also referred to *book debts* in India) that the firm is expected to collect in the near future. The customers from whom receivables or book debts have to be collected in the future are called *trade debtors* or simply as debtors and represent the firm’s claim or asset. A credit sale has three characteristics:¹ First, it involves an element of risk that should be carefully analyzed. Cash sales are totally riskless, but not the credit sales, as the cash payments are yet to be received. Second, it is based on economic value. To the buyer, the economic value in goods or services passes immediately at the time of sale, while the seller expects an equivalent value to be received later on. Third, it implies futurity. The buyer will make the cash payment for goods or services received by him, in a future period.

Debtors constitute a substantial portion of current assets of several firms. For example in India, trade debtors, after inventories, are the major components of current assets. They form about one-third of current assets in India. Granting credit and creating debtors amount to blocking of the firm’s funds. The interval between the date of sale and the date of payment has to be financed out of working capital. This necessitates the firm to get funds from banks or other sources. Thus, trade debtors represent

investment. As substantial amounts are tied-up in trade debtors, it needs careful analysis and proper management.

NOTES

9.1 UNIT OBJECTIVES

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

- Emphasize the need and goals of establishing a sound credit policy
- Describe how an optimum credit policy can be established
- Explain the credit policy variables
- Indicate the credit procedure for and control of individual accounts
- Discuss methods of monitoring receivables
- Discuss the nature and costs and benefits of factoring

9.2 CREDIT POLICY: NATURE AND GOALS

A firm's *investment in accounts receivable* depends on: (a) the volume of credit sales, and (b) the collection period. For example, if a firm's credit sales are ₹ 30 lakh per day and customers, on an average, take 45 days to make payment, then the firm's average investment in accounts receivable is:

$$\begin{aligned} & \text{Daily credit sales} \times \text{Average collection period} \\ & \text{Rs 30 lakh} \times 45 = \text{Rs 1,350 lakh} \end{aligned}$$

The investment in receivables may be expressed in terms of costs of sales instead of sales value.

The volume of credit sales is a function of the firm's total sales and the percentage of credit sales to total sales. Total sales depend on market size, firm's market share, product quality, intensity of competition, economic conditions etc. The financial manager hardly has any control over these variables. The percentage of credit sales to total sales is mostly influenced by the nature of business and industry norms. For example, car manufacturers in India, until recently, were not selling cars on credit. They required the customers to make payment at the time of delivery; some of them even asked for the payment to be made in advance. This was so because of the absence of genuine competition and a wide gap between demand for and supply of cars in India. This position changed after economic liberalization which led to intense competition. In contrast, the textile manufacturers sold two-thirds of their total sales on credit to the wholesale dealers. The textile industry is still going through a difficult phase.

There is one way in which the financial manager can affect the volume of credit sales and collection period and consequently, investment in accounts receivable. That is through the changes in credit policy. The term credit policy is used to refer to the combination of three decision variables: (i) credit standards, (ii) credit terms, and (iii) collection efforts, on which the financial manager has influence.

- **Credit standards** are the criteria to decide the types of customers to whom goods could be sold on credit. If a firm has more slow-paying customers, its investment in accounts receivable will increase. The firm will also be exposed to higher risk of default.

- **Credit terms** specify duration of credit and terms of payment by customers. Investment in accounts receivable will be high if customers are allowed extended time period for making payments.
- **Collection efforts** determine the actual collection period. The lower the collection period, the lower will be the investment in accounts receivable and *vice versa*.

NOTES

9.2.1 Goals of Credit Policy

A firm's credit policy aims at maximizing shareholders' wealth through increase in sales leading to net improvement in profitability. Increased sales will not only increase operating profits, but will also require additional investment and costs. Hence, a trade-off between incremental return and cost of incremental investment is involved.

A firm may follow a lenient or a stringent credit policy. The firm, following a **lenient credit policy**, tends to sell on credit to customers on very liberal terms and standards; credits are granted for longer periods even to those customers whose creditworthiness is not fully known or whose financial position is doubtful. In contrast, a firm following a **stringent credit policy** sells on credit on a highly selective basis, only to those customers who have proven creditworthiness and who are financially strong. In practice, firms follow credit policies ranging between stringent to lenient.

Marketing Tool

Why at all do firms sell on credit? Firms use credit policy as a *marketing tool* for expanding sales. In a declining market, it may be used to maintain the market share. Credit policy helps to retain old customers and create new customers by weaning them away from competitors. In a growing market, it is used to increase the firm's market share. Under a highly competitive situation or recessionary economic conditions, a firm may loosen its credit policy to maintain sales or to minimize erosion of sales.

In practice, companies may grant credit for several other reasons such as the company position, buyer's status and requirement, dealer relationship, transit delays, industrial practice, etc. (see Exhibit 9.1)

Maximization of sales vs. incremental profit: Is sales maximization the goal of the firm's credit policy? If it was so, the firm would follow a very lenient credit policy, and would sell on credit to everyone. Firms in practice do not follow very loose credit policy just to maximize sales. Sales do not expand without costs. The firm will have to evaluate its credit policy in terms of both return and costs of additional sales. Additional sales should add to the firm's operating profit. There are three types of costs involved:

- Production and selling costs
- Administration costs
- Bad-debt losses

Production and selling costs: These costs increase with expansion in sales. If sales expand within the existing production capacity, then only the variable production and selling costs will increase. If capacity is added for sales expansion resulting from loosening of credit policy, then the incremental production and selling costs will include both variable and fixed costs.

NOTES

The difference between incremental sales revenue (ΔSALES) and the incremental production and selling costs (ΔCOST) is the incremental contribution (ΔCONT) of the change in the credit policy. Note that a tight credit policy means rejection of certain types of accounts whose creditworthiness is doubtful. This results into loss of sales and consequently, loss of contribution. This is an **opportunity loss** to the firm. As the firm starts loosening its credit policy, it accepts all or some of those accounts which the firm had earlier rejected. Thus, the firm will recapture lost sales and thus, lost contribution. The opportunity cost of lost contribution declines with the loosening of credit policy.

Administration costs: Two types of administration costs are involved when the firm loosens its credit policy: (a) credit investigation and supervision costs and (b) collection costs. The firm is required to analyze and supervise a large number of accounts when it loosens its credit policy. Similarly, the firm will have to intensify its collection efforts to collect outstanding bills from financially less sound customers. The incremental costs of credit administration will be nil if the existing credit department, without any additional costs, can implement the new credit policy. This will be the case when the credit department has idle capacity.

Bad-debt losses: Bad-debt losses arise when the firm is unable to collect its accounts receivable. The size of bad-debt losses depends on the quality of accounts accepted by the firm. Thus a firm tends to sell to customers with relatively less credit standing when it loosens its credit policy. Some of these customers delay payments, and some of them do not pay at all. As a result, bad-debt losses increase. The firm can certainly avoid or minimize these losses by adopting a very tight credit policy. Is minimisation of bad-debt losses a goal of credit policy? If it was so, no firm will ever sell on credit to anyone. If this happens, then the firm is not availing the opportunity of using credit policy as a marketing tool for expanding sales, and will incur opportunity cost in terms of lost contribution.

Thus, the evaluation of a *change* in a firm's credit policy involves analysis of:²

- opportunity cost of lost contribution
- credit administration costs and bad-debt losses

These two costs behave contrary to each other. Consider Figure 9.1. You can see that as the firm moves from tight to loose credit policy, the opportunity cost declines (that is, the firm recaptures lost sales and thus, lost contribution), but the credit administration costs and bad-debt losses increase (that is, more accounts have to be handled which also include bad accounts which ultimately fail to pay). How should the firm determine its credit policy? The firm's credit policy will be determined by the trade-off between opportunity cost and credit administration costs and bad debts losses. In the Figure 9.1, this trade-off occurs at point A where the total of opportunity costs of lost contribution and credit administration costs and bad-debts losses is minimum. Does point A represent *optimum credit policy*? How can a firm establish an optimum credit policy?

Exhibit 9.1 Why do companies in India Grant Credit?

Companies in practice feel the necessity of granting credit for several reasons:

- **Competition:** Generally the higher the degree of competition, the more is the credit granted by a firm. However, there are exceptions such as firms in the electronics industry in India.

NOTES

- **Company's bargaining power:** If a company has a higher bargaining power *vis-à-vis* its buyers, it may grant no or less credit. The company will have a strong bargaining power if it has a strong product, monopoly power, brand image, large size or strong financial position.
- **Buyer's requirements:** In a number of business sectors buyers/dealers are not able to operate without extended credit. This is particularly so in the case of industrial products.
- **Buyer's status:** Large buyers demand easy credit terms because of bulk purchases and higher bargaining power. Some companies follow a policy of not giving much credit to small retailers since it is quite difficult to collect dues from them.
- **Relationship with dealers:** Companies sometimes extend credit to dealers to build long-term relationships with them or to reward them for their loyalty.
- **Marketing tool:** Credit is used as a marketing tool, particularly when a new product is launched or when a company wants to push its weak product.
- **Industry practice:** Small companies have been found guided by industry practice or norm more than the large companies. Sometimes companies continue giving credit because of past practice rather than industry practice.
- **Transit delays:** This is a forced reason for extended credit, in the case of a number of companies in India. Most companies have evolved systems to minimize the impact of such delays. Some of them take the help of banks to control cash flows in such situations.

Source: Pandey, I.M. and Bhat, R., *Managing Corporate Funds*, Ch. 8 (unpublished monograph).

9.3 OPTIMUM CREDIT POLICY: A MARGINAL COST-BENEFIT ANALYSIS

The firm's operating profit is maximized when total cost is minimized for a given level of revenue. Credit policy at point A in Figure 9.1 represents the *maximum operating profit* (since total cost is minimum). But it is not necessarily the **optimum credit policy**. Optimum credit policy is one which maximizes the firm's value. The value of the firm is maximized when the **incremental** or **marginal rate of return** of an investment is equal to the **incremental** or **marginal cost of funds** used to finance the investment. The incremental rate of return can be calculated as incremental operating profit divided by the incremental investment in receivables. The incremental cost of funds is the rate of return required by the suppliers of funds, given the risk of investment in accounts receivable. Note that the required rate of return is *not* equal to the borrowing rate. Higher the risk of investment, higher the required rate of return. As the firm loosens its credit policy, its investment in accounts receivable becomes more risky because of increase in slow-paying and defaulting accounts. Thus the required rate of return is an upward sloping curve.

In sum, we may state that the goal of the firm's credit policy is to maximize the value of the firm. To achieve this goal, the evaluation of investment in accounts receivable³ should involve the following four steps:

- Estimation of incremental operating profit
- Estimation of incremental investment in accounts receivable
- Estimation of the incremental rate of return of investment
- Comparison of the incremental rate of return with the required rate of return

Consider an example.⁴

NOTES

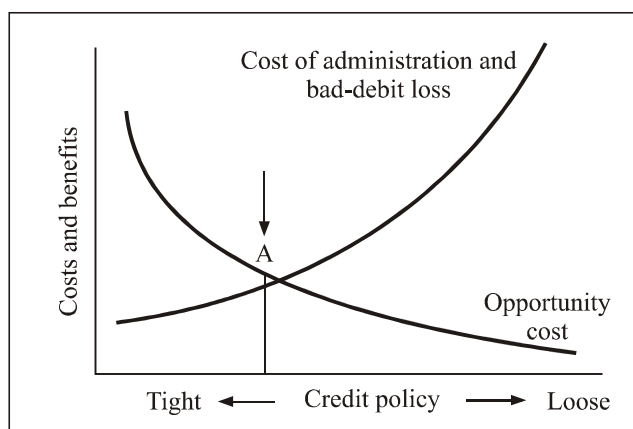


Fig. 9.1 Costs of Credit Policy

Illustration 9.1: Marginal Cost–Benefit Analysis of Credit Policy

In 20X1, the Standard Furniture Mart has total sales of ₹ 600 lakh and after-tax profit of ₹ 69 lakh. Standard's profit margins have been declining over last two-three years. The proprietor of the company thought that this could be due to about 10 per cent of total sales to customers who are not financially very strong. He thought that perhaps the cost of maintaining these accounts is high which may be causing a decline in the firm's profit margin. He therefore asked his financial manager to analyze the impact of tightening the credit policy by discontinuing sales to these customers.

The financial manager should first calculate the incremental operating profit to be foregone by changing the credit policy. He should ascertain the behaviour of costs. Assume that after analyzing past data, he has determined cost behaviour as given in Table 9.1. The financial manager, on investigation, found that bad-debt losses and collection costs are entirely attributable to the marginal accounts.

Table 9.1 Standard Furniture Mart's Behaviour of Cost (Percentage)

	Fixed Cost	Variables Cost	Total Cost
Cost of goods sold	–	82.00	82.00
Administrative costs	2.50	4.00	6.50
Selling costs	2.80	5.70	8.50
Bad-debt losses	–	0.05	0.05
Collection costs	–	0.02	0.02
	5.30	91.77	97.07

Standard's *variable* production, administrative and selling costs are 91.7 per cent of sales (bad-debt losses and collection costs excluded). Thus contribution is 8.3 per cent of sales: $100 - 91.7 = 8.3$ per cent. By tightening its credit policy, Standard can expect to lose sales of ₹ 60 lakh (10 per cent of total sales of ₹ 600 lakh). Thus, the lost contribution will be ₹ 4.98 lakh:

$$\text{Change in contribution} = \text{Change in sales} \times \text{Contribution ratios}$$

$$\Delta \text{CONT} = \text{SALES} \times c = -60 \times 0.083 = -4.98 \text{ lakh} \quad (1)$$

Since bad-debt losses and collection costs were entirely attributable to the marginal accounts, with the discontinuance of sales to those customers, these costs will be avoided. We should subtract these avoidable costs from the contribution to find lost operating profit, which is equal to ₹ 4.56 lakh:

$$\begin{aligned}\text{Change in operating profit} &= \text{Change in contribution} - \text{Additional cost} \\ \Delta \text{ OP} &= \Delta \text{ CONT} - \text{SALES } (b + d) \\ &= -4.98 - [-60(0.0005 + 0.0002)] \\ &= -4.98 + 0.04 = -\text{₹ } 4.94 \text{ lakh}\end{aligned}\quad (2)$$

where b is bad-debt losses ratio and d is collection-expense ratio.

The next step is to determine the investment in accounts receivable (arising on account of marginal accounts). The financial manager found out that the average collection period of marginal accounts was 60 days against 45 days of all other accounts, and 80 per cent of sales to marginal accounts are on credit. Thus the sales value tied down in accounts receivable is ₹ 8 lakh:

$$\begin{aligned}\text{Investment in accounts receivable} &= \frac{\text{Credit sales}}{\text{per day}} \times \text{Average collection period} \\ \text{INVST} &= \frac{\text{SALES} \times f}{360} \times \text{ACP} = \frac{60(0.8)}{360} \times 60 = \text{Rs } 8 \text{ lakh}\end{aligned}\quad (3)$$

In Equation (3), f is the fraction of credit sales in total sales. Note that not all of ₹ 8 lakh represent *out-of-pocket cash investment*; it includes profit margin. Therefore, one view is that investment in accounts receivable should be measured in terms of either variable cost or total cost. Considering only the variable costs, Standard's average investment in accounts receivable (including bad-debt losses and collection charges) is: ₹ 7.34 lakh.

$$8 \times 0.9177 = \text{₹ } 7.34 \text{ lakh}$$

We can now calculate the rate of return which the marginal accounts generate:

$$\begin{aligned}\text{Rate of return} &= \frac{\text{Operating profit after tax}}{\text{Investment in accounts receivable}} \\ r &= \frac{\Delta \text{OPAT}}{\Delta \text{INVST}} = \frac{\Delta \text{OP}(1-T)}{\Delta \text{INVST}}\end{aligned}\quad (4)$$

In our example, assuming tax rate (T) of 35 per cent, the rate of return is 43.8 per cent

$$r = \frac{4.941(1-0.35)}{7.34} = 0.438 \text{ or } 43.8 \text{ per cent}$$

If the sales value is used in determining the investment in accounts receivable, the rate of return works out as 40.1 per cent.

Given the risk of marginal accounts, is this an adequate return? Standard's required rate of return for average risk project is 20 per cent. The financial manager thought it appropriate to add additional 5 per cent for risk premium since marginal

NOTES

NOTES

accounts are highly risky. Comparing the expected rate of return 40.1 per cent (or 43.8 per cent), with the required rate of return of 25 per cent, Standard should continue with its policy of selling to the marginal accounts. Marginal accounts make a net contribution to operating profits:

$$= \left(\frac{\text{Expected return} - \text{Required return}}{\text{Investment in receivables}} \right) \times \text{Investment in receivables}$$

$$= (0.401 - 0.25) \times 8 = ₹ 1.21 \text{ lakh}$$

In fact, there is a scope of further loosening the credit policy. If Standard does so, its administrative costs, bad debt losses and collection costs will increase. The expected rate of return will fall. Thus, loosening of credit policy causes return to fall. Where should Standard stop? The firm will obtain the maximum value for the credit policy when the incremental rate of return on investment in receivable is equal to the opportunity cost of capital (the incremental cost of funds).⁵

As the investment in accounts receivable is increased two things happen: *First*, the marginal expected rate of return falls. *Second*, risk increases, so the required rate of return increases. This is shown in Figure 9.2. The optimum investment lies at a level of investment below that which maximizes operating profit. In the figure operating profit is maximum at the point at which incremental rate of return is zero.

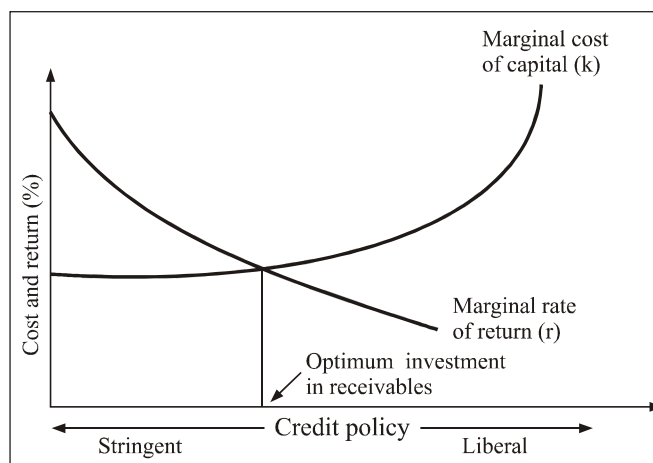


Fig. 9.2 Optimum Level of Receivables

9.4 CREDIT POLICY VARIABLES

In establishing an optimum credit policy, the financial manager must consider the important decision variables which influence the level of receivables. As stated in the preceding section, the major controllable decision—variables—includes the following:

- Credit standards and analysis
- Credit terms
- Collection policy and procedures

The financial manager or the credit manager may administer the credit policy of a firm. It should, however, be appreciated that credit policy has important implications for the firm's production, marketing and finance functions. Therefore, it

Check Your Progress

1. What does a firm's investment in accounts receivable depends on?
2. What does a firm's credit policy aim at?
3. What are the four steps involved in the evaluation of investment in accounts?

is advisable that a committee that consists of executives of production, marketing and finance departments formulates the firm's credit policy. Within the framework of the credit policy, as laid down by this committee, the financial or credit manager should ensure that the firm's value of share is maximized. He does so by answering the following questions:

- What will be the *change* in sales when a decision variable is altered?
- What will be the *cost* of altering the decision variable?
- How would the level of receivables be affected by changing the decision variable?
- How are expected rate of return and cost of funds related?

The most difficult part of the analysis of impact of change in the credit policy variables is the estimation of sales and costs. Even if sales and costs can be estimated, it would be difficult to establish an optimum credit policy, as the best combination of the variables of credit policy is quite difficult to obtain. For these reasons, the establishment of credit policy is a slow process in practice. A firm will change one or two variables at a time and observe the effect. Based on the actual experience, variables may be changed further, or the change may be reversed. It should also be noted that the firm's credit policy is greatly influenced by economic conditions. As economic conditions change, the credit policy of the firm may also change. Thus, the credit policy decision is not one time static decision. The impacts of changes in the major decision variables of credit policy are discussed below.⁶

9.4.1 Credit Standards

Credit standards are the criteria which a firm follows in selecting customers for the purpose of credit extension. The firm may have tight credit standards; that is, it may sell mostly on cash basis, and may extend credit only to the most reliable and financially strong customers. Such standards will result in no bad-debt losses, and less cost of credit administration. But the firm may not be able to expand sales. The profit sacrificed on lost sales may be more than the costs saved by the firm. On the contrary, if credit standards are loose, the firm may have larger sales. But the firm will have to carry larger receivables. The costs of administering credit and bad-debt losses will also increase. Thus, the choice of optimum credit standards involves a trade-off between incremental return and incremental costs.

Credit analysis Credit standards influence the quality of the firm's customers. There are two aspects of the quality of customers: (i) the time taken by customers to repay credit obligations and (ii) the default rate. The **average collection period (ACP)** determines the speed of payment by customers. It measures the number of days for which credit sales remain outstanding. The longer the average collection period, the higher is the firm's investment in accounts receivable. **Default rate** can be measured in terms of bad-debt losses ratio—the proportion of uncollected receivables. Bad-debt losses ratio indicates default risk. **Default risk** is the likelihood that a customer will fail to repay the credit obligation. On the basis of past practice and experience, the financial or credit manager should be able to form a reasonable judgment regarding the chances of default. To estimate the probability of default, the financial or credit manager should consider three *C*'s: (a) character, (b) capacity, and (c) condition.⁷

NOTES

NOTES

- **Character** refers to the customer's willingness to pay. The financial or credit manager should judge whether the customers will make honest efforts to honour their credit obligations. The moral factor is of considerable importance in credit evaluation in practice.
- **Capacity** refers to the customer's ability to pay. Ability to pay can be judged by assessing the customer's capital and assets which he may offer as security. Capacity is evaluated by the financial position of the firm as indicated by analysis of ratios and trends in firm's cash and working capital position. The financial or credit manager should determine the real worth of assets offered as collateral (security).
- **Condition** refers to the prevailing economic and other conditions which may affect the customers' ability to pay. Adverse economic conditions can affect the ability or willingness of a customer to pay. An experienced financial or credit manager will be able to judge the extent and genuineness to which the customer's ability to pay is affected by the economic conditions.

Information on these variables may be collected from the customers themselves, their published financial statements and outside agencies which may be keeping credit information about customers. A firm should use this information in preparing *categories of customers* according to their creditworthiness and default risk. This would be an important input for the financial or credit manager in formulating its credit standards. The firm may categorize its customers, at least, in the following three categories:

- **Good accounts**; that is, financially strong customers.
- **Bad accounts**; that is, financially very weak, high risk customers.
- **Marginal accounts**; that is, customers with moderate financial health and risk (falling between good and bad accounts).

The firm will have no difficulty in quickly deciding about the extension of credit to *good accounts* and rejecting the credit request of *bad accounts*. Most of the firm's time will be taken in evaluating *marginal accounts*; that is, customers who are not financially very strong but are also not so bad to be outrightly rejected. A firm can expand its sales by extending credit to marginal accounts. But the firm's costs and bad-debt losses may also increase. Therefore, credit standards should be relaxed till the point where incremental return equals incremental cost. Consider an example given in Illustration 9.2.

Illustration 9.2 Analyzing Change in Credit Standards

The Peacock Silk Company is contemplating to alter its credit standards. On the basis of the financial position and probabilities of default, the company has divided its customers into four risk categories. The company's potential sales to each category, starting from low to high risk, is ₹ 1.2 crore, ₹ 1.0 crore, ₹ 0.55 crore and ₹ 0.40 crore, and the average collection period is 30 days, 35 days, 45 days and 60 days. The bad-debt ratio is negligible in case of first two categories while it is 2.0 per cent and 5.0 per cent respectively in case of third and fourth categories. Currently, the company extends unlimited credit to the first three categories of customers and none to the last category. The company's variable cost ratio is approximately 80 per cent, and after-tax required rate of return is 15 per cent. The corporate tax rate is 35 per cent. The company wants to extend full credit to category four customers. It is expected that 5 per cent collection costs will have to be spent for this category of customers. The analysis is shown in Table 9.2.

Since the marginal rate of return, 39 per cent, is more than the marginal cost of funds, 15 per cent (or there is net increase in after-tax operating profits by ₹ 1 lakh), the firm can relax its credit standards and extend credit to high-risk customers.

Table 9.2 Peacock Silk Company: Analysis of Decision to Relax Credit Standards

	(₹ in lakh)
1. Incremental sales, ΔSALES	40.0
2. Incremental contribution, ΔCONT $= \Delta \text{SALES} \times c = 40 (1 - 0.80)$	8.0
3. Incremental bad-debt loss and collection costs, $\Delta \text{SALES} (b + d) = 40 \times (0.05 + 0.05)$	4.0
4. Incremental after-tax operating profit, $\Delta \text{OPAT} = [\Delta \text{CONT} - \Delta \text{SALES} (b + d)] (1 - T)$ $= (8.0 - 4.0) (1 - 0.35)$	2.6
5. Incremental investment in receivables $\Delta \text{INVST} : (\Delta \text{SALE} \times \text{ACP} / 360) = 40 / 360 \times 60$	6.7
6. Marginal rate of return, $\Delta \text{OPAT} / \Delta \text{INVST}$	39%
7. Net increase in operating profits, $\Delta \text{OPAT} - k \Delta \text{INVST} = 2.6 - 0.15 \times 6.7$	1.6

Numerical credit scoring: A variety of factors influence a customer's creditworthiness. This makes credit investigation a difficult task. A firm can use numerical credit scoring to appraise credit applications when it is dealing with a large number of small customers. The firm, based on its past experience or empirical study, may identify both financial and non-financial attributes that measure the credit standing of a customer. The numerical credit scoring models may include:

- *Ad hoc* approach
- Simple discriminant analysis
- Multiple discriminant analysis

Ad hoc approach A firm may develop its own *ad hoc* approach of numerical credit scoring to determine the creditworthiness of customers. The attributes identified by the firm may be assigned weights, depending on their importance and be combined to create an overall (simple or weighted) score or index. For example, a bank may consider the attributes given in Table 9.3 while considering a car loan to a customer.

Table 9.3 Ad Hoc Approach: Car Loan Decision

Attribute	Feature	Points
• Telephone	Yes	1
	No	0
• Employment	Employed	2
	Self-employed	1
	Unemployed	0

NOTES

NOTES

• Income	More than ₹ 5 lakh	4
	₹ 2.5 lakh to ₹ 5 lakh	3
	₹ 1.0 lakh to ₹ 2.5 lakh	2
	Less than ₹ 1.0 lakh	1
• Bank accounts	More than one	2
	One	1
	None	0
• Residence	Own	3
	Rented: house	2
	Flat	1
• Marital status	Married	3
	Unmarried	2
	Divorced	1
• Age	Under 25	2
	25 to 35	3
	Over 35	1
• Integrity	Excellent	3
	Good	2
	Fair	1
	Bad	0

Suppose you are 23 years of age and unmarried, and have just graduated from one of the IIMs and got a job of ₹. 7.5 lakh per annum. You have taken a flat on rent connected with a telephone. Your integrity is assessed to be excellent. What is your credit score if you apply for the bank loan for buying a car? Your score is 16 points; that is, telephone-1 point; employment-2 points; income-4 points; bank account-1 point; residence-1 point; marital status-2 points; age-2 points; integrity-3 points. If the cut-off score is 12, bank may grant you loan.

Simple discriminant analysis A firm can use more objective methods of differentiating between good and bad customers. For example, empirical analysis may show that the ratio of earnings before depreciation, interest and taxes (EBDIT) to sales is a significant factor in discriminating good customers from bad customers.⁸ How can the firm determine the cut-off EBDIT to sales ratio? The following steps are involved. First, arrange the paying (good) and non-paying (bad) customers by the magnitude of EBDIT to sales ratio. Second, select a cut-off point to divide the array into two parts with a minimum number of misclassifications. The cut-off point is selected by visual inspection. The firm can consider granting credit to those customers who have EBDIT to sales ratio above the cut-off point.

It may still be better if the firm uses two factors to distinguish between good and bad customers. Two ratios—EBDIT to sales and operating cash flows to sales—together are better indicator of a customer's financial health than one ratio alone.⁹ A combination of these ratios may be plotted on a graph for paying and non-paying customers as shown in Figure 9.3. A straight line in the graph should separate the two groups of customers in a manner that there are minimum misclassifications. This line will tell us how much importance should be given to each ratio. In our example, the **discriminant index** is:

$$\begin{aligned}
 Z &= 30 \text{ EBDIT/S ratio} + 16 \text{ OCF/S ratio} \\
 &= 1.88 \text{ EBDIT/S ratio} + 1 \text{ OCF/S ratio}
 \end{aligned}$$

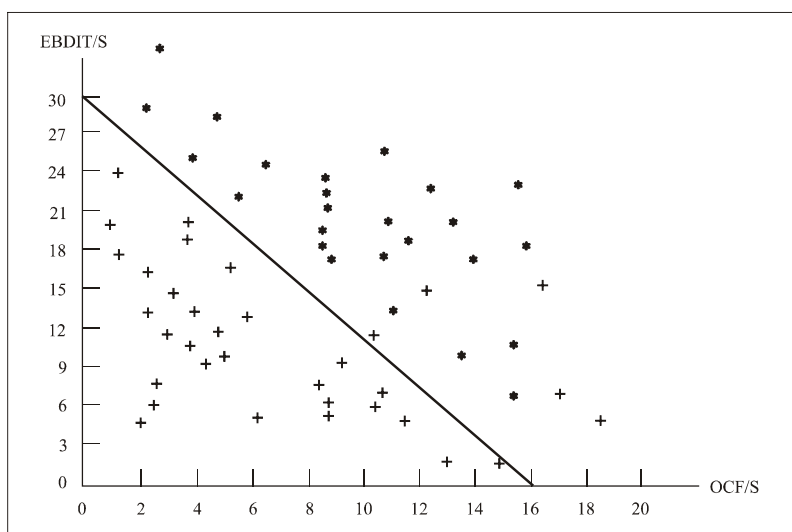


Fig. 9.3 Discriminant analysis based on EBDIT/S and OCF/S ratios

A customer will be considered creditworthy if his Z score is 30 or more.

Multiple-discriminant analysis: In practice, the credit worthiness of a customer will depend on many factors that may interact with each other. The technique of multiple-discriminant analysis combines many factors according to the importance (weight) to be given to each factor and it determines a composite score to differentiate good customers from bad customers. Altman, focusing on the financial attributes of firms in the USA, used **multiple-discriminant analysis** (MDA) to predict bankruptcy of firms.¹⁰ Similar studies have been conducted in India as well. Altman derived the following discriminant function:

$$Z = 0.012 (\text{NWC/TA}) + 0.014 (\text{RE/TA}) + 0.033 (\text{EBIT/S}) + 0.006 (\text{MV/D}) + 0.010 (\text{S/TA})$$

where NWC = net working capital; TA = total assets; RE = retained earnings; EBIT = earnings before interest and taxes; S = sales; MV = market value of equity and D = book value of debt.

On the basis of statistical analysis, Altman's model established a cut-off Z score of 2.675; firms with a score above 2.675 are financially strong while those that have score below 2.675 have a very high likelihood of becoming bankrupt.

Illustration 9.3 Credit Model

You are considering extending credit to firms X and Y which have the following financial ratios. What are their Z scores if you use Altman's model?

Firm	NWC/TA	RE/TA	EBIT/S	MV/D	S/TA
X	20%	10%	7.5%	360%	2.8
Y	16%	12%	6.5%	210%	2.5

Z Score for the firms are calculated as given below:

Z Score for firm X: $0.012 \times 20 + 0.014 \times 10 + 0.033 \times 7.5 + 0.006 \times 360 + 0.010 \times 2.8 = 2.8155$

Z Score for firm Y: $0.012 \times 16 + 0.014 \times 12 + 0.033 \times 6.5 + 0.006 \times 210 + 0.010 \times 2.5 = 1.8595$

NOTES

Since the cut-off score (in Altman's model) is 2.675, firm X with a higher score (2.8155) may be extended credit while firm Y (with a lower score of 1.8595) should be denied credit.

NOTES

Credit scoring models, such as MDA, are based on objective factors, and help a firm to quickly distinguish between good and bad customers. The firm can devote enough time in evaluating the marginal customers. A credit appraiser in the firm can consistently and objectively apply credit standards based on credit scoring models.

Credit scoring models can mislead since they are based on the past data. The firm may refuse credit to a number of marginally good customers. Similarly, a customer who has been regular in paying the dues in the past may fail to do so in the future. A firm need to go beyond credit scoring models in evaluating credit-granting decisions; it may have to rely on good judgement also.

9.4.2 Credit-Granting Decision

Once a firm has assessed the creditworthiness of a customer, it has to decide whether or not credit should be granted. The firm should use the NPV rule to make the decision. If the NPV is positive, credit should be granted. Figure 9.4 shows the choice in a credit granting decision. If the firm chooses not to grant any credit, the firm avoids the possibility of any loss but loses the opportunity of increasing its profitability. On the other hand, if it grants credit, then it will benefit only if the customer pays. There is some probability that the customer will default, and then the firm may lose its investment. The expected net payoff of the firm is the difference between the present value of the net benefit and present value of the expected loss.

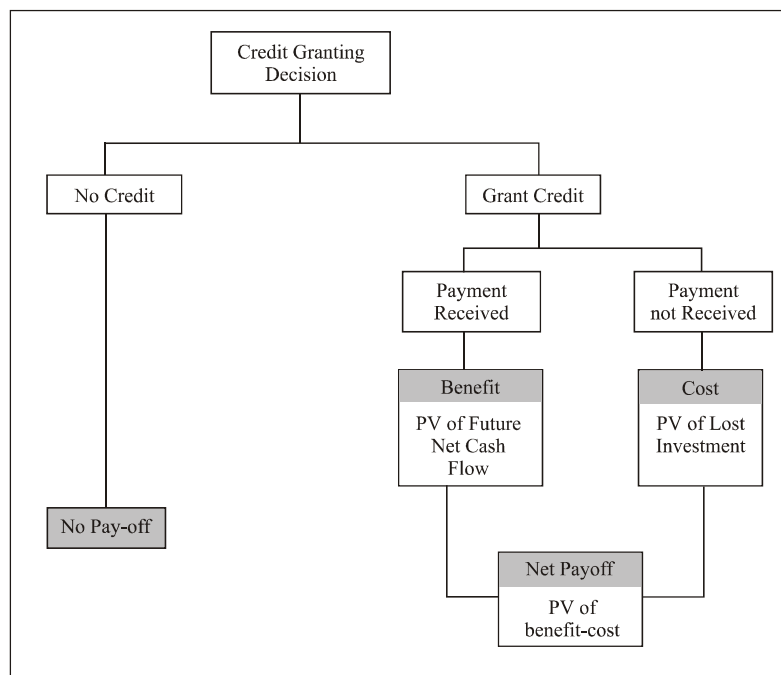


Fig. 9.4 Credit-granting Decision

Suppose a customer wants to purchase goods of ₹ 20,000 on 4-month credit from Karima Wholesale Dry-fruits Merchants & Company. There is 90 per cent probability that the customer will pay in four months and 10 per cent probability that he will not pay anything. The firm's investment (say, equal to the cost of goods sold)

is ₹ 14,000. The firm's required rate of return is 18 per cent. Should credit be granted? If the firm does not give any credit, it loses a possibility of making any profits. On the other hand, if it offers credit, its expected payoff is as follows:

$$\begin{aligned} \text{NPV} &= \left[\frac{p(\text{REV})}{(1+k)^t} - \text{COST} \right] - \left[\frac{(1-p)\text{COST}}{(1+k)^t} \right] \\ \text{NPV} &= \left[\frac{0.9(20,000)}{(1.18)^{1/3}} - 14,000 \right] - \left[\frac{(1-0.9)14,000}{(1.18)^{1/3}} \right] \\ \text{NPV} &= 3,034 - 1,325 = \text{Rs } 1,709 \end{aligned} \quad (5)$$

Since the expected net pay-off is a positive NPV, Karima should extend credit to the customer. Let us ask a different question. What should be the probability of collection that the firm incurs no loss? We can find out the probability of collection at which NPV is zero. That is:

$$\begin{aligned} \text{NPV} &= \left[\frac{p(20,000)}{(1.18)^{1/3}} - 14,000 \right] - \left[\frac{(1-p)14,000}{(1.18)^{1/3}} \right] \\ 18,926p - 14,000 &= 13,248 - 13,248p \\ 32,174p &= 27,248 \\ p &= 0.85 \end{aligned}$$

If the chances that the customer will make payment are better than 85 per cent, Karima Company should extend credit of ₹ 20,000 for four months to the customer.

Let us take another example. Suppose a new customer has asked for a credit of ₹ 11,000 for three months. There is 85 per cent probability that he will make payment after the stipulated time and 15 per cent probability that he will not pay. The firm's cost of the credit (investment) is ₹ 8,000, and it has a required rate of return of 15 per cent. If the firm grants credit, the expected net pay-off is:

$$\begin{aligned} \text{NPV} &= \left[\frac{0.85(11,000)}{(1.15)^{1/4}} - 8,000 \right] - \left[\frac{(1-0.85)8,000}{(1.15)^{1/4}} \right] \\ \text{NPV} &= 1,029 - 1,159 = - \text{Rs } 130 \end{aligned}$$

The firm will decide not to extend credit since NPV is negative. But, what if the customer actually pays and places a repeat order with the firm? If the customer has paid once, there is a high probability, say 95 per cent, that he will pay in the second period. The firm's pay-off in the second period is:

$$\begin{aligned} \text{NPV} &= \left[\frac{0.95(11,000)}{(1.15)^{1/4}} - 8,000 \right] - \left[\frac{(1-0.95)8,000}{(1.15)^{1/4}} \right] \\ \text{NPV} &= 2,091 - 386 = \text{Rs } 1,705 \end{aligned}$$

The pay-off from the second period is a positive NPV of ₹. 1,705. The present value this pay-off is:

$$\text{PV of second period pay-off} = 1,705 / (1.15)^{1/4} = 1,646$$

The firm has an expected loss of ₹ 130 from the initial order. But it has an 85 per cent chance that the customer will pay for the initial order and repeat the order

NOTES

NOTES

that will give the firm a net benefit of ₹ 1,646 today. Therefore, the total expected pay-off is: $-130 + 0.85 \times 1,646 = ₹ 1,269$. The firm should decide to grant credit in spite of the possibility of a loss on the initial order because if the customer proves trustworthy, the firm will get repeat orders and ultimately, its benefits will far exceed the expected loss. Thus, in their credit granting decisions, firms should have a long-term perspective and should think in terms of securing dependable customers who will stay with the firm for a long period.

Credit terms: The stipulations under which the firm sells on credit to customers are called **credit terms**. These stipulations include: (a) the credit period, and (b) the cash discount.

Credit period: The length of time for which credit is extended to customers is called the **credit period**. It is generally stated in terms of a net date. For example, if the firm's credit terms are 'net 35', it is expected that customers will repay credit obligation not later than 35 days. A firm's credit period may be governed by the industry norms. But depending on its objective, the firm can lengthen the credit period. On the other hand, the firm may tighten its credit period if customers are defaulting too frequently and bad-debt losses are building up.

A firm lengthens credit period to increase its operating profit through expanded sales. However, there will be net increase in operating profit only when the cost of extended credit period is less than the incremental operating profit. With increased sales and extended credit period, investment in receivables would increase. Two factors cause this increase: (a) incremental sales result in incremental receivables and (b) existing customers will take more time to repay credit obligation (i.e., the average collection period will increase), thus increasing the level of receivables. Let us consider an example.

Illustration 9.4: Change in Credit Period Policy

Sudarsan Trading Limited is considering to increase its credit period from 'net 35' to 'net 50.' The firm's sales are expected to increase from ₹ 120 lakh to ₹ 180 lakh and average collection period to increase from 35 days to 50 days. The bad-debt loss ratio and collection costs ratio are expected to remain at 5 per cent and 6 per cent respectively. The firm's variable costs ratio is 85 per cent, corporate tax rate is 35 per cent and the after-tax required rate of return is 20 per cent.

Table 9.4 contains the analysis of the impact of changing the credit period. Note that incremental investment in receivables is calculated, assuming that credit period will increase from 35 days to 50 days for all customers.

The firm's decision to relax credit period is not beneficial; the expected return of 11.7 per cent is much less than the cost of funds of 20 per cent. If the firm goes ahead with its decision, it will decrease its operating profit by Rs 1.11 lakh.

You may notice in Table 9.4, the way in which the incremental investment in receivables has been calculated. Incremental investment in receivables can be calculated by using the following formula:

$$\begin{aligned} & \text{New level of receivables} - \text{old level of receivables} \\ &= (\text{New sales}/360) \times (\text{New average collection period}) \\ & \quad - (\text{Old sales}/360) \times (\text{Old average collection period}) \\ &= \frac{\text{SALES}_n}{360} \times \text{ACP}_n - \frac{\text{SALES}_o}{360} \times \text{ACP}_o \end{aligned} \quad (6)$$

where $SALES_n$ is new sales, $SALES_0$ is present sales, ACP_n is new average collection period and ACP_0 is old collection period.

For a quick calculation, we can use the following equation to determine the net increase in operating profit:

$$\begin{aligned} &= [\Delta SALES \times c - \Delta SALES (b + d)] (1 - T) - k \times \Delta INVST \\ &= \Delta SALES (c - b - d)(1 - T) - k \times \Delta INVST \end{aligned} \quad (7)$$

where (INVST) is equal to: incremental investment

$$\Delta INVST = (SALES_n \times ACP_n - SALES_0 \times ACP_0) / 360 \quad (8)$$

Similarly, the expected rate of return can be calculated as follows:

$$r = \frac{\Delta SALES (c - b - d)(1 - T)}{\Delta INVST}$$

Note that c is contribution ratio, b bad-debt ratio, d collection cost, ACP collection period and T tax rate.

Table 9.4 Sudarsan Trading Limited: Analysis of the Impact of Change in Credit Period

	(₹ lakh)
1. Incremental sales, $\Delta SALES$	60.0
2. Incremental contribution, $\Delta CONT = \Delta SALES \times c, 60 \times 0.15$	9.0
3. Incremental bad-debt and collection costs, $\Delta COST = \Delta SALES (b + d)$ $= 60.0 \times (0.05 + 0.06)$	6.6
4. Incremental operating profit, $\Delta OP = \Delta CONT - \Delta COST, 9.0 - 6.6$	2.4
5. Incremental after-tax operating profit, $\Delta OPAT = \Delta OP (1 - T), 2.4 (1 - 0.35)$	1.56
6. Incremental investment in receivables, $\Delta INVST = (SALES_n / 360) \times ACP_n$ $- (SALES_0 / 360) \times ACP_0$ $= (180 / 360 \times 50) - (120 / 360 \times 35)$	13.33
7. Marginal rate of return, $\Delta OPAT / \Delta INVST, 1.56 \div 13.33$	11.7%
8. Net increase in operating profits, $\Delta OPAT - k \Delta INVST, 1.56 - 0.2 \times 13.33$	-1.11

Illustration 9.5: Collection Period Analysis

An analysis of Delite Plastics Private Limited's credit policy reveals that it is very loose, and as a result, the firm's collection period is very long as well as bad-debt losses are building up. The firm, therefore, is considering tightening up its credit standards by shortening credit period from 45 days to 30 days. The expected result of this policy would be to reduce sales from ₹ 600,000 to ₹ 500,000 and bad-debt losses ratio from 4 per cent to 2 per cent and collection expenses from 2 per cent to 1 per cent of total sales. The firm's variable cost ratio is 80 per cent, tax rate is 40 per cent and the after-tax cost of funds is 12 per cent.

The first step is to determine the change in the after-tax operating profit. Sales are expected to decline by ₹ 100,000. Contribution ratio is: $1 - 0.8 = 0.2$; therefore, decline in total contribution is:

$$\Delta CONT = \Delta SALES \times c = (100,000) \times 0.2 = \text{Rs } (20,000)$$

NOTES

Because of the tightening of the credit policy, both bad-debt losses and collection costs will decline. The decline will be equal to the difference between current losses minus new loss. The decline in these two costs will be:

NOTES

$$\begin{aligned}\Delta \text{COST} &= \text{Bad - debt losses} + \text{Collection costs} \\ &= \text{SALES}_n \times b_n - \text{SALES}_o \times b_o \\ &\quad + (\text{SALES}_n \times d_n - \text{SALES}_o \times d_o) \\ &= \text{SALES}_n (b_n + d_n) - \text{SALES}_o (b_o + d_o)\end{aligned}$$

In our example, the cost will decline by:

$$\begin{aligned}\Delta \text{COST} &= 500,000 (0.02 + 0.01) - 600,000 (0.04 + 0.02) \\ &= 15,000 - 36,000 = -(\text{Rs } 21,000)\end{aligned}$$

Thus, the change in operating profit is:

$$\begin{aligned}\Delta \text{OP} &= \Delta \text{CONT} - \Delta \text{COST} \\ &= -20,000 - (-21,000) = +\text{Rs } 1,000\end{aligned}$$

and the change in after-tax operating profit is:

$$\Delta \text{OPAT} = \Delta \text{OP} (1 - T) = 1,000 (1 - 0.4) = ₹ 600$$

Next step is to calculate investment in receivables; since both sales and average collection period decline, investment in receivables will also decline. It is given by the difference between new level of receivables minus current level of receivables:

$$\begin{aligned}\Delta \text{INVST} &= \frac{\text{SALES}_n}{360} \times \text{ACP}_n - \frac{\text{SALES}_o}{360} \times \text{ACP}_o \\ &= \frac{500,000}{360} \times 30 - \frac{600,000}{360} \times 45 \\ &= 41,667 - 75,000 = -(\text{Rs } 33,333)\end{aligned}$$

Since investment declines, the opportunity cost of funds tied in receivables will also reduce:

$$k \times \Delta \text{INVST} = 0.12 \times - (33,333) = - (\text{₹ } 4,000)$$

The net increase in the after-tax operating profit is:

$$\Delta \text{OPAT} - k \times \Delta \text{INVST} = 600 - (-4,000) = ₹ 4,600$$

The firm should introduce the change. Alternatively, to arrive at the decision, the expected rate to return (r) could be compared with the cost of funds (k). The expected rate of return in the example is:

$$r = \frac{\Delta \text{OPAT}}{\Delta \text{INVST}} = \frac{4,600}{33,333} = 0.138 \text{ or } 13.8\%$$

Since $r = 13.8$ per cent is greater than $k = 12$ per cent, the policy change is beneficial to the firm. One could have arrived at the results by using the following equation:

$$\begin{aligned}&= [\Delta \text{SALES} \times c - \{\text{SALES}_n (b_n + d_n) - \text{SALES}_o (b_o + d_o)\}] (1 - T) \\ &\quad - [k \{(\text{SALES}_n \times \text{ACP}_n - \text{SALES}_o \times \text{ACP}_o) / 360\}]\end{aligned} \quad (9)$$

Using data in example, we obtain:

$$= [-100,000 \times 0.2 - \{500,000 (0.02 + 0.001)$$

$$\begin{aligned}
 & - 600,000 (0.04 + 0.02) \} (1 - 0.4) - [0.12 \{ 500,000 \times \\
 & 30 - 600,000 \times 45 \} / 360] \\
 = & [- 20,000 - (- 21,000)] (1 - 0.4) - 0.12 (- 33,333) \\
 = & 1,000 (1 - 0.4) - (- 4,000) \\
 = & 600 + 4,000 = ₹ 4,600
 \end{aligned}$$

NOTES

Cash discounts: A **cash discount** is a reduction in payment offered to customers to induce them to repay credit obligations within a specified period of time, which will be less than the normal credit period. It is usually expressed as a percentage of sales. Cash discount terms indicate the rate of discount and the period for which it is available. If the customer does not avail the offer, he must make payment within the normal credit period.

In practice, credit terms would include: (a) the rate of cash discount, (b) the cash discount period, and (c) the net credit period. For example, credit terms may be expressed as '2/10, net 30.' This means that a 2 per cent discount will be granted if the customer pays within 10 days; if he does not avail the offer he must make payment within 30 days.

A firm uses cash discount as a tool to increase sales and accelerate collections from customers. Thus, the level of receivables and associated costs may be reduced. The cost involved is the discounts taken by customers.

Illustration 9.6: Analyzing Cash Discount Decision

The Swan Fabric Limited is considering of introducing a cash discount. The company's credit terms are 'net 40', and would like to change to '1/15, net 40.' The current average collection period is 60 days and is expected to decrease to 30 days with the new credit terms. It is expected that 50 per cent of customers will take advantage of the changed credit terms. Swan's annual sales are ₹ 6,000,000, and required rate of return is 15 per cent. Assume corporate tax rate of 50 per cent.

Note that Swan is not expecting any change in sales. The decision under consideration will be analyzed in terms of cost of cash discount and saving of opportunity cost of reduced investment in receivables. The cost of cash discount is:

$$\begin{aligned}
 \text{Cost of cash discount} &= \text{Sales} \times \text{Percentage of taking} \\
 &\quad \text{discount} \times \text{Percentage discount} \\
 &= 6,000,000 \times 0.5 \times 0.01 = \text{Rs } 30,000
 \end{aligned}$$

Since the firm can deduct cash discount of ₹ 30,000 for taxes, its after tax cost will be: $30,000 \times 0.5 = ₹ 15,000$.

Next step is to determine the change in investment in receivables. It can be found out as the difference between new level of receivables minus current level of receivables:

$$\begin{aligned}
 \Delta \text{INVST} &= \frac{\text{SALES}}{360} \times \text{ACP}_n - \frac{\text{SALES}}{360} \times \text{ACP}_0 \\
 &= [\text{SALES} (\text{ACP}_n - \text{ACP}_0)] / 360
 \end{aligned}$$

Thus in our example, it is:

$$= [6,000,000 (30 - 60)] / 360 = ₹ 500,000$$

The net change in the firm's operating profit is:

$$\begin{aligned}\Delta \text{OPAT} &= -15,000 + 0.15 \times 500,000 \\ &= -15,000 + 75,000 = \text{Rs } 60,000\end{aligned}$$

NOTES

The new credit terms are expected to be beneficial to the firm.

9.4.3 Collection Policy and Procedures

A collection policy is needed because all customers do not pay the firm's bills in time. Some customers are slow-payers while some are non-payers. The collection efforts should, therefore, aim at accelerating the collections from slow-payers and reducing the bad-debt losses. A collection policy should ensure prompt and regular collection. Prompt collection is needed for fast turnover of working capital, keeping collection costs and bad-debts within limits and maintaining collection efficiency. Regularity in collections keeps debtors alert, and they tend to pay their dues promptly.

The collection policy should lay down clear-cut collection procedures. The collection procedures for past dues or delinquent accounts should also be established in unambiguous terms. The slow-paying customers should be handled very tactfully. Some of them may be permanent customers. The collection process initiated quickly, without giving any chance to them, may antagonize them, and the firm may lose them to competitors.

The responsibility for collection and follow-up should be explicitly fixed. It may be entrusted to the accounts or sales department, or to a separate credit department. The co-ordination between accounts and sales departments is necessary and must be ensured formally. The accounting department maintains the credit records and information. If it is responsible for collection, it should consult the sales department before initiating an action against non-paying customers. Similarly, the sales department must obtain past information about a customer from the accounting department before granting credit to the customer.

Though collection procedures should be firmly established, individual cases should be dealt with on their merits. Some customers may be temporarily in tight financial position and in spite of their best intentions may not be able to pay on due date. This may be due to recessionary conditions, or other factors beyond the control of the customers. Such cases need special considerations. The collection procedure against them should be initiated only after they have overcome their financial difficulties and do not intend to pay promptly.

The firm should decide about offering cash discount for prompt payment. Cash discount is a cost to the firm for ensuring faster recovery of cash. Some customers fail to pay within the specified discount period, yet they may make payment after deducting the amount of cash discount. Such cases must be promptly identified and necessary action should be initiated against them to recover the full amount.

In practice, companies may take certain precautions *vis-à-vis* collections. Some companies require their customers to give *pre-signed cheques*. **Bills discounting** is another practice in India. Unfortunately, it is not very popular with a number of companies. Some companies provide a penal rate of interest for debtors who fail to pay in time. Exhibit 9.2 gives a brief account of the credit policy and practices at Siemens (India).

Exhibit 9.2 Credit Policy and Practices at Siemens India

Siemens (India) is a large, heavy engineering company. The following is the summary of the company's credit policy and practices (in the beginning of 90s).

- The company sells about 85 per cent of its products through dealers, and the remaining 15 per cent is sold directly to large corporate customers. Generally, a 45-day credit is extended to dealers, but a lot of variation exists for different dealers.
- The company grants credit to dealers for three reasons:
 - (a) It is an industry norm in this sector to grant credit.
 - (b) The time lag between delivery of goods and the receipt of payments by the company's customers are large. Therefore, they expect company to extend credit to them.
 - (c) The company wants its dealers to make about 5 per cent profits, and credit is extended to enable them to achieve this goal.
- The company has a system of centralized control and decentralized collections. The control office receives a statement of sales and daily from all branches to initiate appropriate actions, if any. The company also requires its dealers to give a 3 monthly forecast of their requirements. No large changes are permitted in orders, and dealers' requirements are shipped regularly, without their enquiries. Branch managers are authorized to decide credit for both dealers and corporate clients.
- The company sells to corporate clients only through a bank guarantee. Initially new dealers are given no credit. After dealing with the company for some time, they are granted credit.
- The company follows a rigorous system of credit evaluation for both corporate clients as well as dealers. Branches involve corporate office in the evaluation of dealers. The customers are required to make payments by demand drafts. Local customers could pay by cheques.
- It is the responsibility of salesmen to collect dues if they are delayed. For delayed payments, the company charges a penalty interest rate of 22 per cent. However, if a dealer has no defaults, he gets a quarter of percentage of sales as bonus. The company hardly faces the problem of bad debts. Also, cheques received from customers have hardly bounced.

Source: Based on information collected by Amardeep Singh and Varun Kapur.

NOTES

9.5 CREDIT EVALUATION OF INDIVIDUAL ACCOUNTS

For effective management of credit, the firm should lay down clear cut guidelines and procedures for granting credit to individual customers and collecting individual accounts. The firm need not follow the policy of treating all customers equal for the purpose of extending credit. Each case may be fully examined before offering any credit terms. Similarly, collection procedure will differ from customer to customer. With the permanent, but temporarily defaulting, customers, the firm may not be very strict in following the collection procedures.

The credit evaluation procedure of the individual accounts should involve the following steps: (1) credit information, (2) credit investigation, (3) credit limits, and (4) collection procedures.¹¹

Check Your Progress

4. What are credit standards?
5. What does the numerical credit scoring model include?
6. What is a cash discount?
7. Why is a collection policy needed?

NOTES

9.5.1 Credit Information

In extending credit to customers, the firm would ensure that receivables will be collected in full and on due date. Credit should be granted to those customers who have the ability to make the payment on time. To ensure this, the firm should have credit information concerning each customer to whom the credit will be granted.

Little progress has been made in India in the matter of developing the sources of credit information in the name of secrecy and confidentiality. The sources of credit information in advanced countries include independent information service companies, banks, fellow business firms and associates, competitors, suppliers etc. In India, banks are sometimes used to collect information about potential customers.

Collecting credit information involves cost. The cost of collecting information should, therefore, be less than the potential profitability. For small accounts, comprehensive information may not be collected; the decision to grant credit may be made on the basis of limited information. In addition to cost, the time required to collect information should also be considered. The decision to grant credit cannot be delayed for long because of the time involved in collecting the credit information. Depending on these two factors of time and cost, any, or a combination of the following sources may be employed to collect the information.

Financial statement: One of the easiest ways to obtain information regarding the financial condition and performance of the prospective customer is to scrutinize his financial statements—balance sheet and the profit and loss account. The published financial statements of public limited companies are easily available. The real difficulty arises in obtaining the financial statements from partnership firms or individuals, particularly the audited accounts since they do not have legal obligation to audit their accounts. The credit granting firm must insist on the audited financial statements. In case of firms that have seasonal sales, data on monthly sales, inventory and cash flows ought to be sought and analyzed.

Bank references: Another source of collecting credit information is the bank where the customer maintains his account. In advanced countries like USA, many banks have large credit departments which can provide detailed credit information. The firm should seek to obtain the information through its bank. A customer can also be requested to instruct his banker to provide information required by the firm. In India, banks as a source of information are not very useful because of their indifference in providing information. A bank does not provide unambiguous answers to the enquiries made by a firm. Even if it provides information to the firm about the conduct of the customer's account, it can not be taken as a complete basis for believing that the customer will be able to settle his dues in time. More information from other sources may be collected to supplement it.

Trade references: A firm can ask the prospective customer to give trade references. It may insist to give the names of such persons or firms with whom the customer has current dealings. This is a useful source to obtain credit information at no cost. The trade referees may be contacted personally to obtain all relevant information required by a firm. A customer can, however, furnish misleading references. To guard against this, the honesty and seriousness of the referees should be examined. The firm can insist on furnishing of the references of people or firms of repute.

Other sources: A firm can also obtain information about the prospective customer from the credit rating organizations (such as CRISIL, CARE or ICRA) and trade and industry associations. In advanced countries like the USA, credit bureau reports are an important source of information about a customer.

9.5.2 Credit Investigation and Analysis

After having obtained the credit information, the firm will get an idea regarding the matters which should be further investigated. The factors that affect the extent and nature of credit investigation of an individual customer are:¹²

- The type of customer, whether new or existing.
- The customer's business line, background and the related trade risks.
- The nature of the product—perishable or seasonal.
- Size of customer's order and expected further volumes of business with him.
- Company's credit policies and practices.

Analysis of credit file: The firm should maintain a credit file for each customer. It should be updated with the information about the customer collected from the reports of salesmen, bankers and directly from the customer. The firm's trade experiences with the customer and his performance report based on financial statements submitted by him should also be recorded in his credit file. A regular examination of the customer's credit file will reveal to the firm the credit standing of the customer. Whenever the firm experiences a change in the customer's paying habit or receives a request for extended credit terms or large order on credit, his credit file should be thoroughly scrutinized. The intensity and depth of credit review on investigation will depend upon the quality of the customer's account and the amount of credit involved. A little review will be required in case of the customers who have had clear deals with the firm in the past. But a comprehensive investigation will be required in case of the customers whose quality of accounts is falling and who have not been able to honour the firm's credit terms regularly in the past.

Analysis of financial ratios: The evaluation of the customer's financial conditions should be done very carefully. The financial statements submitted by the prospective customer will form a basis to analyze the performance and trends of his business activities. Ratios should be calculated to determine the customer's liquidity position and ability to repay debts. The performance of the customer should be compared with industry average and his nearest competitors. This will be helpful in determining whether his relatively poor performance is due to some general economic condition affecting the whole industry, or it is due to the internal inefficiencies of the applicant.

Analysis of business and its management: Besides appraising the financial strength of the applicant, the firm should also consider the quality of management and the nature of the customer's business. The firm should conduct a **management audit** to identify the management weaknesses of the customer's business. An over-centralized structure of the customer's business, without proper management systems, can degenerate into mismanagement, over-trading and business failure.

If the nature of the customer's business is highly fluctuating or he has financially weak buyers or his business depends on a few buyers, then it is relatively risky to extend credit to him. The implications of these aspects should be fully understood before extending credit to customers.

NOTES

NOTES

9.5.3 Credit Limit

A **credit limit** is a maximum amount of credit which the firm will extend at a point of time. It indicates the extent of risk taken by the firm by supplying goods on credit to a customer.¹³ Once the firm has taken a decision to extend credit to the applicant, the amount and duration of the credit have to be decided. The decision on the magnitude of credit will depend upon the amount of contemplated sale and the customer's financial strength. In case of customers who are frequent buyers of the firm's goods, a credit limit can be established. This would avoid the need to investigate each order from the customers. Depending on the regularity of payment, the line of credit for a customer can be fixed on the basis of his normal buying pattern. For example, if a customer normally buys goods of ₹ 25,000 per month on an average, for him the line of credit can be fixed at this level. In case of a customer who is not fairly regular in settling the dues, the credit limit may be fixed with reference to the outstanding amount.

The credit limit must be reviewed periodically. If tendencies of slow paying are found, the credit can be revised downward. At times, a customer may ask for the amount of credit in excess of his credit limit. The firm may at such times agree to his request if the product has a high margin or if additional sales help to use the unutilized capacity of the firm, and the cost of expected delayed payment or bad-debt loss is less than the expected incremental profit.

The firm has not only to determine the amount of credit but also the duration of credit. Keeping in view the industry norm, the normal collection period should be determined. Some customers can seek relaxation in the collection period. As has been discussed earlier, a longer collection period involves costs—the opportunity costs of funds being tied-up for a longer period and the cost of possible bad-debt losses. But if the extended credit period motivates sales, a comparison between the cost of extended credit period and the additional profit resulting from the increased sale should be made. If profits exceed costs, the collection period may be extended, otherwise not.

9.5.4 Collection Efforts

The firm should follow a well laid-down collection policy and procedure to collect dues from its customers. When the normal credit period granted to a customer is over, and he has not made the payment, the firm should send a polite letter to him reminding that the account is overdue. If the customer does not respond, the firm may send progressively strong-worded letters. If receivable still remains uncollected, letters may be followed by telephone, telegram, and personal visit of the firm's representative. If the payment is still not made, the firm may initiate a legal action against the customer. Before taking the legal action, the firm must examine the customer's financial condition. If it is weak, legal action against him will simply hasten his insolvency. The firm will not be able to get anything from the customer. Under such situation, it is better to be patient and wait, or accept reduced payment in the settlement of the account.

9.6 MONITORING RECEIVABLES

A firm needs to continuously monitor and control its receivables to ensure the success of collection efforts. Two traditional methods of evaluating the management of receivables are: (1) **average collection period** (ACP) and (2) **aging schedule**. These methods have certain limitations to be useful in monitoring receivables. A better approach is the **collection experience matrix**.

1. Average Collection Period

We have earlier defined average collection period as:

$$ACP = \frac{\text{Debtors} \times 360}{\text{Credit sales}}$$

The average collection period so calculated is compared with the firm's stated credit period to judge the collection efficiency. For example, if a firm's stated credit period is 25 days and the actual collection period is 40 days, then one may conclude that the firm has a lax system of collection. An extended collection period delays cash inflows, impairs the firm's liquidity position and increases the chances of bad-debt losses. The average collection period measures the quality of receivables since it indicates the speed of their collectability.

There are two limitations of this method. First, it provides an average picture of collection experience and is based on aggregate data. For control purposes, one needs specific information about the age of outstanding receivables. Second, it is susceptible to sales variations and the period over which sales and receivables have been aggregated. Thus, average collection period cannot provide a very meaningful information about the quality of outstanding receivables.¹⁴

2. Aging Schedule

The aging schedule removes one of the limitations of the average collection period. It breaks down receivables according to the length of time for which they have been outstanding. Let us now illustrate aging schedule of receivables:

If the firm's stated credit period is 25 days, the aging schedule indicates that 50 per cent of receivables remain outstanding beyond this period. A significant amount of receivables remains uncollected, much longer than the firm's credit period. Thus, aging schedule provides more information about the collection experience. It helps to spot out the slow-paying debtors. However, it also suffers from the problem of aggregation, and does not relate receivables to sales of the same period.

<i>Outstanding</i>	<i>Outstanding (₹)</i>	<i>Percentage</i>
0–25	200,000	50.0
26–35	100,000	25.0
36–45	50,000	12.5
46–60	30,000	7.5
Over 60	20,000	5.0
	400,000	100.0

3. Collection Experience Matrix

The major limitations of the traditional methods is that they are based on aggregated data and fail to relate outstanding receivables of a period with the credit sales of the same period. Thus, using the traditional methods, two analysts can come up with entirely different signals about the status of receivables if they aggregate sales and the receivables data differently. Using disaggregated data for analyzing collection experience can eliminate this problem. The key is to relate receivables to sales of the

NOTES

NOTES

same period. When sales over a period of time are shown horizontally and associated receivables vertically in a tabular form, a matrix is constructed. Therefore, this method of evaluating receivables is called **collection experience matrix**. Consider an example.¹⁵

Suppose the financial manager of a firm is analyzing its receivables from the credit sales of past six months starting from July to December. The credit sales of the company are as follows:

	₹ lakh		₹ lakh
July	400	October	220
August	410	November	205
September	370	December	350

From the sales ledger, the financial manager gathered outstanding receivables data for each month's sales. For example, he found that for July, there was a sale for ₹ 400 lakh, the outstanding receivables during July, August and September were ₹ 330 lakh, ₹ 242 lakh and ₹ 80 lakh. Similarly, he ascertained receivables for sales of other months. This information is shown in Table 9.5.

Table 9.5 Sales and Receivables from July to December

		(₹ lakh)					
	Month	July	Aug.	Sept.	Oct.	Nov.	Dec.
Sales		400	410	370	220	205	350
Receivables							
	July	330					
	Aug.	242	320				
	Sept.	280	245	320			
	Oct.	240	276	210	162		
	Nov.	240	240	272	120	160	
	Dec.	240	240	240	240	130	285

Table 9.6 Collection Experience Matrix

		(₹ lakh)					
	Month	July	Aug.	Sept.	Oct.	Nov.	Dec.
Sales		400	410	370	220	205	350
Receivables (%)							
	July	82.5					
	Aug.	60.5	78.0				
	Sept.	20.0	59.8	86.5			
	Oct.	0	18.5	56.8	73.6		
	Nov.	0	0	19.5	54.5	78.0	
	Dec.	0	0	0	18.2	63.0	81.4

How do we interpret information contained in Table 9.5? We can convert the table to a collection experience matrix by dividing the outstanding receivables in each column by sales amount in that column. This is shown in Table 9.6, which contains information on the percentage of receivables to the credit sales from which those receivables have originated. For example, for the sales of July, 82.5 per cent receivables (i.e., 330/400) were outstanding at the end of July, 60.5 per cent (i.e., 242/400) at the

end of August and 20 per cent (i.e., 80/400) at the end of September. In other words, 17.5 per cent receivables were paid by the end of July, 39.5 per cent by the end of August (viz., $39.5 - 17.5 = 22$ per cent additional receivables were paid in August), 80 per cent by the end of September (viz., $80 - 39.5 = 41.5$ per cent additional receivables were paid during September) and remaining receivables were collected during October so that the balance of book debts became nil at the end of October. Receivables of other months can also be analyzed in the same way. Thus, when we read a column top-down, we get an idea of the manner in which the firm collects a given month's sales. How well does the firm collect current month's sales? This can be ascertained by reading the diagonals drawn in Table 9.6. For example, the top diagonal shows the manner in which current month's sales are collected. The next diagonal shows receivables one month older and so on. For the firm in our example, we find in Table 9.6 that about 80 per cent of sales in a given month remain uncollected by the end of that month. In other words, about 20 per cent of sales in a given month are collected in the same month. If the percentages increase as we move down any diagonal, it implies that the firm is unable to collect its receivables faster. This requires an investigation for appropriate remedial action.

NOTES

9.7 FACTORING

Credit management is a specialized activity, and involves a lot of time and effort of a company. Collection of receivables poses a problem, particularly for small-scale enterprises. Banks have the policy of financing receivables. However, this support is available for a limited period and the seller of goods and services has to bear the risk of default by debtors. A company can assign its credit management and collection to specialist organizations, called factoring organizations. **Factoring** is a popular mechanism of managing, financing and collecting receivables in developed countries like USA and UK, and has extended to a number of other countries in the recent past, including India. Subsidiaries of four Indian banks provide factoring services. In this section, we explain the nature and types of factoring services and its costs and benefits.

9.7.1 Nature of Factoring

Factoring is a unique financial innovation. It is both a financial as well as a management support to a client. It is a method of converting a non-productive, inactive asset (i.e., a receivable) into a productive asset (viz., cash) by selling receivables to a company that specializes in their collection and administration.¹⁶ For a number of companies, cash may become a scarce resource if it takes a long time to receive payment for goods and services supplied by them. Such a current asset in the balance sheet is, in fact, illiquid and serves no business purpose; it is much better to sell that asset for cash which can be immediately employed in the business. A 'factor' makes the conversion of receivables into cash possible.

One can define factoring as 'a business involving a continuing legal relationship between a financial institution (the factor) and a business concern (the client) selling goods or providing services to trade customers (the customers) whereby the factor purchases the client's accounts receivable and in relation thereto, controls the credit, extended to customers and administers the sales ledger.'¹⁷ Factoring may also be defined as 'a contract between the suppliers of goods/services and the factor under which:

NOTES

- (a) the supplier and its customers (debtors) other than those for the sale of goods bought primarily for their personal, family or household use;
- (b) the factor is to perform at least two of the following functions
 - (i) finance for the supplier, including loans and advance payments;
 - (ii) maintenance of accounts (ledgering relating to the receivables);
 - (iii) collection of accounts (ledgering relating to the receivables) and
 - (iv) protection against default in payment by debtors;
- (c) notice of assignment of the receivables is to be given to debtors'.¹⁸

The agreement between the supplier and the factor specifies the factoring procedure. Usually, the firm sends the customer's order to the factor for evaluating the customer's creditworthiness and approval. Once the factor is satisfied about the customer's creditworthiness and agrees to buy receivables, the firm despatches goods to the customer. The customer will be informed that his account has been sold to the factor, and he is instructed to make payment directly to the factor. To perform his functions of credit evaluation and collection for a large number of clients, a factor may maintain a credit department with specialized staff. Once the factor has purchased a firm's receivables and if he agrees to *own* them, he will have to provide protection against any bad-debt losses to the firm.

9.7.2 Factoring Services

While purchase of receivables is fundamental to the functioning of factoring, the factor provides the following three basic services to clients:¹⁹

- Sales ledger administration and credit management
- Credit collection and protection against default and bad-debt losses
- Financial accommodation against the assigned book debts (receivables)

Credit administration: A factor provides full credit administration services to his clients. He helps and advises them from the stage of deciding credit extension to customers to the final stage of book debt collection. The factor maintains an account for all customers of all items owing to them, so that collections could be made on due date or before. He helps clients to decide whether or not and how much credit to extend to customers. He provides clients with information about market trends, competition and customers and helps them to determine the creditworthiness of customers. He makes a systematic analysis of the information regarding credit for its proper monitoring and management. He prepares a number of reports regarding credit and collection, and supplies them to clients for their perusal and action.

Credit collection and protection: When individual book debts become due from the customer, the factor undertakes all collection activity that is necessary. He also provides full or partial protection against bad-debts. Because of his dealings with a variety of customers and defaults with different paying habits, he is in a better position to develop appropriate strategy to guard against possible defaults.

Financial assistance: Often factors provide financial assistance to the client by extending advance cash against book debts. Customers of "clients" become debtors of a factor and have to pay to him directly in order to settle their obligations. Factoring thus involves an outright purchase of debts, allowing full credit protection against any

bad debts and providing financial accommodation against the firm's book debts. In USA, the maximum advance a factor provides is equal to the amount of factored receivables *less* the sum of (i) the factoring commission, (ii) interest on advance, and (iii) reserve that the factor requires to cover bad-debts losses. The amount of reserve depends on the quality of factored receivables and usually ranges between 5 to 20 per cent in the USA.

In view of the services provided by a factor, factoring involves the purchase of a client's book debts with the purpose of facilitating credit administration, collection and protection. It is also a means of short-term financing. It provides protection against the default in payment for book debts. For these services, the factor, however, charges a fee from the client. Thus, factoring has a cost.

Other services: In developed countries like the USA, factors provide many other services. They include: (i) providing information on prospective buyers; (ii) providing financial counselling; (iii) assisting the client in managing its liquidity and preventing sickness; (iv) financing acquisition of inventories; (v) providing facilities for opening letters of credit by the client etc.²⁰

Factoring and Short-term Financing

Although factoring provides short-term financial accommodation to the client, it differs from other types of short-term credit in the following manner:²¹

- Factoring involves 'sale' of book debts. Thus, the client obtains advance cash against the expected debt collection and does not incur a bad-debt.
- Factoring provides flexibility as regards credit facility to the client. He can obtain cash either immediately or on due date or from time to time, as and when he needs cash. Such flexibility is not available from formal sources of credit.
- Factoring is a unique mechanism which not only provides credit to the client but also undertakes the total management of client's book debts.

Factoring and Bills Discounting

Factoring should be distinguished from bill discounting. Bill discounting or invoice discounting consists of the client drawing bills of exchange for goods and services on buyers, and then discounting it with bank for a charge. Thus, like factoring, bill discounting is a method of financing. However, it falls short of factoring in many respects. Factoring is all of bills discounting plus much more. Bills discounting has the following limitations in comparison to factoring:

- Bills discounting is a sort of borrowing while factoring is the efficient and specialized management of book debts along with enhancement of the client's liquidity.
- The client has to undertake the collection of book debt. Bill discounting is always 'with recourse', and as such, the client is not protected from bad-debts.
- Bills discounting is not a convenient method for companies having large number of buyers with small amounts since it is quite inconvenient to draw a large number of bills.

NOTES

9.7.3 Types of Factoring

The factoring facilities available worldwide can be broadly classified into four main groups:²²

NOTES

1. Full service non-recourse (old line)
2. Full service recourse factoring
3. Bulk/agency factoring
4. Non-notification factoring

Full service non-recourse: Under this method, book debts are purchased by the factor, assuming 100 per cent credit risk. The full amount of invoices have to be paid to clients in the event of debt becoming bad. He also advances cash upto 80–90 per cent of the book debts immediately to the client. Customers are required to make payment directly to the factor. The factor maintains the sales ledger and accounts and prepares age-wise reports of outstanding book debts.

Non-recourse factoring is most suited to the following situations where:²³

- amounts involved per customer are relatively substantial and financial failure can jeopardize client's business severely;
- there are a large number of customers of whom the client cannot have personal knowledge; and
- the client prefers to obtain 100 per cent cover under factoring rather than take insurance policy which provides only 70–80 per cent cover.

Non-recourse factoring is very popular in the USA, where it is also known as '**old-line**' factoring. Old-line factors are true factors and they differ from those who merely finance receivables.

Full service recourse factoring: In this method of factoring, the client is not protected against the risk of bad-debts. He has no indemnity against unsettled or uncollected debts. If the factor has advanced funds against book debts on which a customer subsequently defaults, the client will have to refund the money.

Most countries practice recourse factoring since it is not easy to obtain credit information, and the cost of bad-debt protection is very high. This type of factoring is often used as a method of short-term financing, rather than pure credit management and protection service. It is less risky from the factor's point of view, and thus, it is less expensive to the client than non-recourse factoring. This type of factoring is also preferred when large spread of customers with relatively low amount per customer is involved, or the client is selling to high-risk customers.²⁴

Advance factoring and maturity factoring: The non-recourse and recourse factoring can be further classified into:

- Advance factoring
- Maturity factoring

As discussed above, under the **advance factoring**, the factor advances cash against book debts due to the client immediately. **Maturity factoring** implies that payment will be made to the client on maturity. In the case of non-recourse maturity factoring, payment is on maturity or when the book debts are collected, or on the insolvency of the customers. In the case of recourse maturity factoring, the factor

pays to the client when the book debts have been collected. The client with sound financial condition and liquidity may prefer maturity factoring.

Bulk/agency factoring: This type of factoring is basically used as a method of financing book debts. Under this the client continues to administer credit and operate sales ledger. The factor finances the book debts against bulk either on recourse or without recourse. This sort of factoring became popular with the development of mini-computers market where marketing and credit management was not a problem but the firms needed temporary financial accommodation. Those companies which have good systems of credit administration, but need finances, prefer this form of factoring.

Non-notification factoring: In this type of factoring, customers are not informed about the factoring agreement. It involves the factor keeping the accounts ledger in the name of a sales company to which the client sells his book debts. It is through this company that the factor deals with the client's customers. The factor performs all his usual functions without a disclosure to customers that he owns the book debts. This type of factoring is available in the UK to financially strong companies.

9.7.4 Costs and Benefits of Factoring

There are two types of costs involved:

- the factoring commission or service fee
- the interest on advance granted by the factor to the firm.

Factoring commission is paid for credit evaluation and collection and other services and to cover bad-debt losses. It is usually expressed as a percentage of net face value of receivables factored, and in developed countries like USA, it ranges between 1 to 3 per cent.²⁵ In India, a charge of around 2.5 to 3 per cent is envisaged. In fact, factoring commission will depend on the total volume of receivables, the size of individual receivables, and the quality of receivables. The commission is expected to be higher for 'without recourse' factoring since the factor assumes the entire credit risk.

The interest on advance would be higher than the prevailing prime rate of interest or the bank overdraft rate. In USA, factors charge a premium ranging between 2 to 5 per cent over and above the prime rate of interest. If this rule is applied to India where the prime rate of interest on the working capital finance is about 16 per cent, then the interest rate on advances by factors may range between 18 to 23 per cent. However, in the opinion of experts, factors should not charge more than what the banks are charging since they would be in competition with them as regards the financing of receivables.²⁶

If factoring is so expensive, why should firms go for it? There are certain benefits which result from factoring receivables, and they more than offset the costs of factoring. Factoring has the following benefits:

- Factoring provides specialized service in credit management, and thus, helps the firm's management to concentrate on manufacturing and marketing.
- Factoring helps the firm to save cost of credit administration due to the scale of economics and specialization.

Technical or marketing entrepreneurs often start many firms, and they may fail or may lack expertise to provide adequate attention to credit control and financial management. This leads to inefficient management of working capital and the

NOTES

NOTES

undertaking of unwarranted risks. By utilizing a factoring facility, companies are able to access specialist management service in the highly specialized field of credit management, covering efficient credit control and protection, sales ledger accounting and credit collection. As a company grows, the factor will involve more professionals to handle these problems. Thus the management time is released to focus on technology, production, marketing, personnel and other managerial functions.

A factor is in a position to employ specialists for the credit control and management since he has to cater to a larger number of firms and has substantial funds to invest, whereas for a small growing company its level of business operations deter the use of expensive functional specialists. The credit management specialization by the factor and his employment of highly skilled personnel for many clients, allows enormous benefits for his individual clients. Thus, the firm can save costs of credit administration. It does not require a credit department; it does not have to incur costs of credit investigation, evaluation and collection and the bad-debt losses. A factor, who specializes in credit administration, is better placed to control bad debt losses than the credit department or the financial manager of a small or medium size firm, due to his experience and specialization in handling receivables of a variety of firms.

Once the business of a factor grows, he can develop such a degree of specialization in certain areas that his services are also demanded by large firms who are not in a position to perform similar services as diligently and efficiently. Large firms can particularly use the services of factors for the purpose of preventing defaults and bad debts. In this area the factor has the advantage of dealing with certain industries and a large number of customers with different profiles and habits. Thus, he is able to inculcate distinct skills of analyzing the debt paying habits of customers.

A firm should evaluate costs and benefits of factoring to arrive at a decision regarding the employment of a factor. Let us consider an example to illustrate the trade-off between costs and benefits of factoring.

Illustration 9.7: Analysis of Factoring Decision

A small firm has credit sales of ₹ 80 lakh and its average collection period is 80 days. The past experience indicates that bad-debt losses are around 1 per cent of credit sales. The firm spends about ₹ 1,20,000 per annum on administering its credit sales. This cost includes salaries of one officer and two clerks who handle credit checking, collection, etc., and telephone and telex charges. These are avoidable costs. A factor is prepared to buy the firm's receivables. He will charge 2 per cent commission. He will also pay advance against receivables to the firm at an interest rate of 18 per cent after withholding 10 per cent as reserve. What should the firm do?

Let us first calculate the average level of receivables. The collection period is 80 days and credit sales are ₹ 80 lakh; therefore, the average level of receivables is (assuming 360 days in a year):

$$\begin{aligned}\text{Average level of receivables} &= \frac{8,000,000}{360} \times 80 \\ &= \text{Rs } 1,777,778\end{aligned}$$

The advance, which the factor will pay, will be the average level of receivables less factoring commission, reserve and interest on advance. The factoring commission is 2 per cent of average receivables (80 days):

$$\text{Factoring commission} = 0.02 \times 1,777,778 = ₹ 35,556$$

and reserve is:

$$\text{Reserve} = 0.10 \times 1,777,778 = ₹ 177,778$$

Thus, the amount available for advance is:

$$\begin{aligned}\text{Advance available} &= 1,777,778 - 35,556 - 177,778 \\ &= ₹ 1,564,444\end{aligned}$$

However, the factor will also deduct 18 per cent interest before paying the advance for 80 days. Therefore, the amount of advance to be paid by the factor is:

Advance to be paid

$$\begin{aligned}&= 1,564,444 - (0.18 \times 1,564,444 \times 80/360) \\ &= 1,564,444 - 62,578 = ₹ 1,501,866\end{aligned}$$

What is the annual cost of factoring to the firm? The annual costs include the following:

Factoring commission:	$35,556 \times 360/80$	160,002
Interest charges:	$62,578 \times 360/80$	<u>281,601</u>
		₹ 441,603

The firm saves the following costs:

Cost of credit administration	120,000
Cost of bad-debt loss, $0.01 \times 8,000,000$	<u>80,000</u>
	₹ 200,000

The net cost of factoring to the firm is:

$$\text{Net cost of factoring} = 441,603 - 200,000 = ₹ 241,603$$

The effective rate of interest of firm is:

$$\begin{aligned}\text{Effective rate of annual cost} &= \frac{241,603}{1,501,866} \\ &= 0.161 \text{ or } 16.1 \text{ per cent}\end{aligned}$$

The annual percentage cost of 16.1 per cent of factoring receivables can be compared with the cost of other possible sources of short-term financing.

Ideally, factoring should benefit all—client, customer and factor. This may not happen because of the lack of clarity as regards the roles of the client and the factor, inept handling of credit and other functions by the client and the factor, overestimation of benefits or underestimation of costs etc. The client should understand that the factor can function efficiently with his full cooperation. For example, it is not possible for a factor to resolve all disputes arising between the client and the factor, particularly those which are technical in nature. Similarly, a conflict may arise between the client and the factor as regards the question of credit-risk. The factor may like to reduce or enhance credit limit to customers depending on his assessment of the credit risk which the client may not agree with. Factoring benefits the client, but the overall benefits in the long-run occur from the good management of production and marketing operations. Factoring, by ensuring the credit collection, helps the firm to concentrate on production and marketing.

NOTES

Check Your Progress

8. What is a firm required to do for the effective management of credit?
9. What are the factors that affect the extent and nature of credit investigation of an individual customer?
10. List two traditional methods of evaluating the management of receivables?
11. What is factoring?
12. What are the four main groups of factoring facilities?

9.8 SUMMARY

NOTES

- Trade credit creates debtors (book debts) or accounts receivable. It is used as a marketing tool to maintain or expand the firm's sales.
- A firm's investment in accounts receivable depends on volume of credit sales and collection period.
- The financial manager can influence volume of credit sales and collection period through credit policy. Credit policy includes credit standards, credit terms, and collection efforts.
- Credit standards are criteria to decide to whom credit sales can be made and how much. If the firm has soft standards and sells to almost all customers, its sales may increase but its costs in the form of bad-debt losses and credit administration will also increase. Therefore, the firm will have to consider the impact in terms of increase in profits and increase in costs of a change in credit standards or any other policy variable.
- The incremental return that a firm may gain by changing its credit policy should be compared with the cost of funds invested in receivables. The firm's credit policy will be considered optimum at the point where incremental rate of return equals the cost of funds.
- The cost of funds is related to risk; it increases with risk. Thus, the goal of credit policy is to maximize the shareholders wealth; it is neither maximization of sales nor minimization of bad-debt losses.
- The conditions for extending credit sales are called credit terms and they include the credit period and cash discount.
- Cash discounts are given for receiving payments before than the normal credit period. All customers do not pay within the credit period. Therefore, a firm has to make efforts to collect payments from customers.
- Collection efforts of the firm aim at accelerating collections from slow-payers and reducing bad-debt losses. The firm should in fact thoroughly investigate each account before extending credit. It should gather information about each customer, analyze it and then determine the credit limit. Depending on the financial condition and past experience with a customer, the firm should decide about its collection tactics and procedures.
- There are three methods to monitor receivables. The average collection period and aging schedule are based on aggregate data for showing the payment patterns, and therefore, do not provide meaningful information for controlling receivables. The third approach that uses disaggregated data is the collection experience matrix. Receivables outstanding for a period are related to credit sales of the same period. This approach is better than the two traditional methods of monitoring receivables.
- Factoring involves sale of receivables to specialized firms, called factors. Factors collect receivables and also advance cash against receivables to solve the client firms' liquidity problem. For providing their services, they charge interest on advance and commission for other services.

9.9 KEY TERMS

- **Trade Credit:** Trade credit is the credit extended by one trader to another for the purchase of goods and services. Trade credit facilitates the purchase of supplies without immediate payment.
- **Credit Policy:** Credit policy are clear, written guidelines that set (1) the terms and conditions for supplying goods on credit, (2) customer qualification criteria, (3) procedure for making collections, and (4) steps to be taken in case of customer delinquency.
- **Financial Statement:** A financial statement (or financial report) is a formal record of the financial activities of a business, person, or other entity. Relevant financial information is presented in a structured manner and in a form easy to understand.
- **Factoring:** Factoring is a financial transaction and a type of debtor finance in which a business sells its accounts receivable (i.e., invoices) to a third party (called a factor) at a discount.

NOTES

9.10 ANSWERS TO ‘CHECK YOUR PROGRESS’

1. A firm's *investment in accounts receivable* depends on: (a) the volume of credit sales, and (b) the collection period.
2. A firm's credit policy aims at maximizing shareholders' wealth through increase in sales leading to net improvement in profitability.
3. To achieve this goal, the evaluation of investment in accounts receivable should involve the following four steps:
 - Estimation of incremental operating profit
 - Estimation of incremental investment in accounts receivable
 - Estimation of the incremental rate of return of investment
 - Comparison of the incremental rate of return with the required rate of return
4. Credit standards are the criteria which a firm follows in selecting customers for the purpose of credit extension. The firm may have tight credit standards; that is, it may sell mostly on cash basis, and may extend credit only to the most reliable and financially strong customers.
5. The numerical credit scoring models may include:
 - *Ad hoc* approach
 - Simple discriminant analysis
 - Multiple discriminant analysis
6. A cash discount is a reduction in payment offered to customers to induce them to repay credit obligations within a specified period of time, which will be less than the normal credit period.
7. A collection policy is needed because all customers do not pay the firm's bills in time. Some customers are slowpayers while some are non-payers. The collection efforts should, therefore, aim at accelerating the collections from

NOTES

slow-payers and reducing the bad-debt losses. It should ensure prompt and regular collection.

8. For effective management of credit, the firm should lay down clear cut guidelines and procedures for granting credit to individual customers and collecting individual accounts.
9. The factors that affect the extent and nature of credit investigation of an individual customer are:
 - The type of customer, whether new or existing.
 - The customer's business line, background and the related trade risks.
 - The nature of the product—perishable or seasonal.
 - Size of customer's order and expected further volumes of business with him.
 - Company's credit policies and practices
10. Two traditional methods of evaluating the management of receivables are: (1) average collection period (ACP) and (2) aging schedule.
11. Factoring is a method of converting a non-productive, inactive asset (i.e., a receivable) into a productive asset (viz., cash) by selling receivables to a company that specializes in their collection and administration.
12. The factoring facilities available worldwide can be broadly classified into four main groups:
 - Full service non-recourse (old line)
 - Full service recourse factoring
 - Bulk/agency factoring
 - Non-notification factoring

9.11 QUESTIONS AND EXERCISES

Short-Answer Questions

1. What are the goals of credit policy?
2. Write a short note on marketing tools.
3. What are collection procedures?
4. What is credit limit?
5. What are factoring services?

Long-Answer Questions

1. Illustrate with the help of graphs, the marginal cost-benefit analysis.
2. Discuss in detail the three credit policy variables.
3. Discuss how credit for individual accounts is evaluated?
4. Discuss the methods for evaluating the management of receivables?
5. Describe the different types of factoring.

9.12 FURTHER READING

- Pandey, IM. 2009. *Financial Management*. India: Vikas Publishing Pvt Ltd.
- Kuchal, SC. 1999. *Financial Management: An Analytical and Conceptual Approach*. India: Chaitanya Publishing house.
- Horne Van, C. James. 2001. *Financial Management and Policy*. New Delhi: Prentice Hall.

Endnotes

1. Ramamoorthy, V.E., *Working Capital Management*, Chennai: Institute for Financial Management and Research, 1976, p. 183.
2. Solomon, E. and J.J. Pringle, *An Introduction to Financial Management*, Prentice-Hall of India, 1977, pp. 200–01.
3. The analytical approach discussed in this next section is based on Oh, J.S., “Opportunity Cost in the Evaluation of Investment in Accounts Receivables”, *Financial Management*, Summer 1976; and Dyle, E.A., “Another Look at the Evaluation of Investments in Account Receivables”, *Financial Management*, Winter 1977.
4. See the case titled, Allen Distribution Company in Butters, *et. al.*, *Case Problems in Finance*, Richard D. Irwin, 1981, for a detailed practical situation.
5. Solomon and Pringle, *op. cit.*, 1977, p. 204.
6. See Oh, *op. cit.*, 1976, and Dyle, *op. cit.*, 1977, for the approach adopted here.
7. Two more C’s may be added to this: *capital* and *collateral*. See, Weide, J.V. and S.E. Maier, *Managing Corporate Liquidity: An Introduction to Working Capital Management*, John Wiley, 1985, p. 258. Also, see Weston, J.F. and T.E. Copeland, *Managerial Finance*, Dryden Press, 1986, pp. 341–42.
8. Gupta, L.C., *Financial Ratios as Forewarning Indicators of Corporate Sickness*. Bombay, ICICI, 1979.
9. *Ibid.*
10. Altman, E.I., Financial Ratios, Discriminant Analysis and the Prediction of Corporate Bankruptcy, *Journal of Finance*, 23, pp. 589–609 (September 1968).
11. See Van Horne, J.C., *Financial Management and Policy*, Prentice-Hall of India, 1985, pp. 398–405; and Ramamoorthy, *op. cit.*, 1976, pp. 188–202.
12. Ramamoorthy, *op. cit.*, 1976, p. 195.
13. Van Horne, *op. cit.*, 1985, p. 402.
14. For a discussion of the limitations of average collection period and aging schedule, see Lewellen, W.G. and R.W. Johnson, Better Way to Monitor Accounts Receivables, *Harvard Business Review*, (May–June, 1972), pp. 101–19.
15. See Lewellen and Johnson, *op. cit.* 1972, for a detailed discussion of the logic and example of collection experience matrix.
16. Westlake, M., *Factoring*, Pitman, 1975, p. 1.
17. Biscoe, P.N., *Law and Practice of Credit Factoring*, Butterworth & Company, 1975, p. 5.
18. Definition given by the Unidroit Convention on International Factoring held in Ottawa, Canada, May 1988, quoted in the Reserve Bank of India, *Report of the Study Group for Examining Introduction of Factoring Services in India*, Reserve Bank of India, December 1988, pp. 44–45.
19. For a detailed discussion, see Phelps, C.W., *The Role of Factoring*, Commercial Credit Company, 1956, pp. 17–47.

NOTES

NOTES

20. Reserve Bank of India (R.B.I.), *Report of the Study Group for Examining the Introduction of Factoring Services in India*, Bombay, Reserve Bank of India, 1988, p. 17.
21. Gupta, G.P., *et. al.*, *Factoring—An Innovative Financial Service for Small Scale Sector*, (Internal Document), Industrial Development Bank of India, August 1985.
22. Phelps, *op. cit.*, 1956, R.B.I., *op. cit.*, Gupta, *et. al.*, *op. cit.*, 1985.
23. Gupta, *et. al.*, *op. cit.*, 1985, p. 10.
24. Gupta, *et. al.*, *op. cit.*, 1985; p. 11.
25. R.B.I., *op. cit.*, 1988, p. 111.
26. R.B.I., *ibid.*

UNIT 10 DIVIDEND POLICIES

Structure

- 10.0 Introduction
- 10.1 Unit Objectives
- 10.2 Objectives of Dividend Policy
 - 10.2.1 Firm's Need for Funds
 - 10.2.2 Shareholders' Need for Income
- 10.3 Practical Considerations in Dividend Policy
 - 10.3.1 Firm's Investment Opportunities and Financial Needs
 - 10.3.2 Shareholders' Expectations
 - 10.3.3 Constraints on Paying Dividends
- 10.4 Stability of Dividends
 - 10.4.1 Constant Dividend Per Share or Dividend Rate
 - 10.4.2 Constant Payout
 - 10.4.3 Constant Dividend Per Share Plus Extra Dividend
 - 10.4.4 Merits of Stability of Dividends
 - 10.4.5 Danger of Stability of Dividends
- 10.5 Target Payout and Dividend Smoothing: Lintner's Model of Corporate Dividend Behaviour
- 10.6 Forms of Dividends
 - 10.6.1 Cash Dividend
 - 10.6.2 Bonus Shares
 - 10.6.3 Advantages of Bonus Shares
 - 10.6.4 Limitations of Bonus Shares
 - 10.6.5 Conditions for the Issue of Bonus Shares
- 10.7 Share Split
 - 10.7.1 Bonus Share versus Share Split
 - 10.7.2 Reasons for Share Split
 - 10.7.3 Reverse Split
- 10.8 Dividend Policy Analysis: Case of (L&T) Limited
- 10.9 Summary
- 10.10 Key Terms
- 10.11 Answers to 'Check Your Progress'
- 10.12 Questions and Exercises
- 10.13 Further Reading

NOTES

10.0 INTRODUCTION

Earnings distributed to shareholders are called dividends. The percentage of earnings paid as dividends is called payout ratio. A high payout ratio means more dividends and less funds for expansion and growth. A low payout, on the other hand, results in a higher growth. Does dividend policy affect the market value of the firm? Whether dividend will increase value or not may depend on the profitable investment opportunities available to the firm.

In Walter's view it depends on the profitability of investment opportunities available to the firm and the cost of capital. If the firm has profitable opportunities, its value will be maximum when 100 per cent of earnings are retained. Walter's formula for the market price of shares is:

$$P = \frac{\text{DIV}}{k} + \frac{r(\text{EPS} - \text{DIV})/k}{k}$$

where r is return on investment opportunities and k is the cost of capital. Gordon also arrives at the same conclusion with the help of the following formula:

$$P_0 = \frac{\text{DIV}_1}{k - rb}$$

where b is the retention ratio and $rb = g$ is growth in dividends.

Yet another view is that because of the uncertainty of capital gains, investors like more dividends. This implies that, the market price of shares of high-payout companies will command premium.

Miller and Modigliani do not agree with the view that dividends affect the market value of shares. According to them if the investment policy of the firm is given, then dividend policy is a trade-off between cash dividends and issue of ordinary shares. The share price will be adjusted by the amount of dividend distributed. Thus, the existing shareholder is neither better off nor worse off. His wealth remains unchanged. For their view, M-M assume perfect capital market, no transaction costs and no taxes.

The practical world is not simple; there exist transaction costs as well as taxes. In such a world, one view is that investors like cash dividends. Thus there is a clientele for high-payout shares.

Except tax-exempt investors, there does not seem to be a strong reason for investors to prefer high-payout shares. In fact, in a tax-differential world, where capital gains are taxed at low rate, investors in high-tax brackets would prefer low-payout shares. In an extreme situation like the one currently prevailing in India, where dividends are not taxed while capital gains are taxed, investors will prefer dividends. Thus, there does not seem to be a consensus on whether dividends matter or not. In practice, a number of factors will have to be considered before deciding about the appropriate dividend policy of the firm.

On the one hand, we have the view that dividends increase the value of the share. On the other hand, there is the view that dividends are bad as they result into the payment of higher taxes (because of the difference in the ordinary income and capital gains tax rates), and thus, they reduce the shareholders' wealth. We also have a moderate view, which asserts that because of the information value of dividends, some dividends should be always paid to maintain the value of the share. Given these theoretical differences, how do companies set their dividend policies in practice? What factors do they consider in setting their policies?

10.1 UNIT OBJECTIVES

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

- Explain the objectives of dividend policy
- Understand the factors that influence a firm's dividend policy
- Focus on the importance of the stability of dividend.
- Discuss the significance and implications of bonus shares and stock splits
- Explain the corporate behaviour of dividends

10.2 OBJECTIVES OF DIVIDEND POLICY

A firm's **dividend policy** has the effect of dividing its net earnings into two parts: retained earnings and dividends. The retained earnings provide funds to finance the firm's long-term growth. It is the most significant source of financing a firm's investments in practice. Dividends are paid in cash. Thus, the distribution of earnings uses the available cash of the firm. A firm which intends to pay dividends and also needs funds to finance its investment opportunities will have to use external sources of financing, such as the issue of debt or equity. Dividend policy of the firm, thus, has its effect on both the long-term financing and the wealth of shareholders. As a result, the firm's decision to pay dividends may be shaped by the following two possible viewpoints.

10.2.1 Firm's Need for Funds

When dividend decision is treated as a financing decision, the net earnings of the firm may be considered as a source of long-term funds. With this approach, dividends will be paid only when the firm does not have profitable investment opportunities. The firm grows at a faster rate when it accepts highly profitable investment projects. External equity could be raised to finance investments. But retained earnings are preferred because, unlike external equity, they do not involve any flotation costs. The distribution of cash dividends causes a reduction in internal funds available to finance profitable investment opportunities and consequently, either constrains growth or requires the firm to find other costly sources of financing.¹ Thus, firms may retain their earnings as a part of long-term financing decision. The dividends will be paid to shareholders when a firm cannot profitably reinvest earnings. With this approach, dividend decision is viewed merely as a **residual decision**.

10.2.2 Shareholders' Need for Income

One may argue that capital markets are not perfect; therefore, shareholders are not indifferent between dividends and retained earnings. Because of the market imperfections and uncertainty, shareholders may prefer the near dividends to the future dividends and capital gains. Thus, the payment of dividends may significantly affect the market price of the share. Higher dividends may increase the value of the shares and low dividends may reduce the value. It is believed by some that, in order to maximise wealth under uncertainty, the firm must pay enough dividends to satisfy investors.² Investors in high tax brackets, on the other hand, may prefer to receive capital gains rather than dividends. Their wealth will be maximised if firms retain earnings rather than distributing them.

The management of a firm, while evolving a dividend policy, must strike a proper balance between the above-mentioned two approaches. When the firm increases the retained portion of the net earnings, shareholders' current income in the form of dividends decreases. But the use of retained earnings to finance profitable investments will increase the future earnings. On the other hand, when dividends are increased, shareholders' current income will increase, but the firm may have to forego some investment opportunities for want of funds and consequently, the future earnings may decrease. Management should develop a dividend policy, which divides the net earnings into dividends and retained earnings in an optimum way to achieve the objective of maximising the wealth of shareholders. The development of such policy will be greatly influenced by investment opportunities available to the firm and the value of dividends as against capital

NOTES

Check Your Progress

1. Why is a firm's dividend policy important?
2. Why is dividend decision sometimes known as a residual decision?

gains to the shareholders. The other possible aspects of the dividend policy relate to the stability of dividends, the constraints on paying dividends and the forms of dividends.

NOTES

10.3 PRACTICAL CONSIDERATIONS IN DIVIDEND POLICY

The view that dividends are irrelevant is not entirely correct, once we modify the assumptions underlying this view to consider the realities of the world. In practice, every firm follows some kind of dividend policy. The typical dividend policy of most firms is to retain between one-third to half of the net earnings and distribute the remaining amount to shareholders. Companies in India specify dividends in terms of a **dividend rate** (a percentage of the paid-up capital per share). Most of them also tend to increase dividend rate particularly when their profits increase substantially.

There are a very few exceptions to the practice of paying high dividends and continuously increasing dividends. The Chairman and Managing Director of the Great Eastern Shipping Company Limited, is in favour of not paying any dividends. Deliberating on the company's dividend policy in his 1992–93 Chairman's Statement, he stated:

“... We do not intend to maintain dividends as a percentage of the face value of your share, nor do we intend to maintain dividend at a fixed rupee value.... it is our intention to retain as much profit as we possibly can, ideally we should like to retain all our earnings, we certainly believe that to be in the shareholders' interest, ... payment of dividends is an inefficient way of increasing shareholders' wealth. That, had we been a new company the most sensible policy may well have been to pay no dividends and accumulate our profits. This is a policy followed by the most successful companies in the world. We have been inhibited in doing so by tradition and conventional wisdom. ...”

The following questions relate to the dividend policy of a firm:

- What are the firm's financial needs given its growth plans and investment opportunities?
- Who are the firm's shareholders and what are their preferences with regard to dividend payments?
- What are the firm's business risks?
- What are the firm's constraints—financial and legal—in paying dividends?
- Is control a consideration for the firm?
- Should the firm follow a stable dividend policy?
- How should the firm pay dividends—cash dividend or bonus shares or shares buyback?

It is not easy to answer these questions. A number of factors will have to be evaluated to analyse each of these questions to evolve a long-term dividend policy for the firm. Broadly speaking, to develop a long-term dividend policy, the directors of a company should aim at bringing a balance between the desires of shareholders and the needs of the company. The factors that generally influence the dividend policy of the firm are discussed below.³

10.3.1 Firm's Investment Opportunities and Financial Needs

Firms should tailor their dividend policies to their long-term investment opportunities to have maximum financial flexibility and avoid financial frictions and costs of raising external

funds. Growth firms have a large number of investment opportunities requiring substantial amount of funds. Hence they will give precedence to the retention of earnings over the payment of dividends in order to finance its expanding activities. For matured firms, investment opportunities occur infrequently. These firms may distribute most of their earnings. The retained earnings of these firms during periods, when they do not have investment opportunities, may be invested in short-term securities yielding nominal returns. Some of these firms may follow the policy of paying 100 per cent dividends and raise external funds when investment opportunities occur.

Generally, retained earnings should be used as a source of internal financing only when a company has profitable investment opportunities. If shareholders themselves have better investment opportunities, the earnings should be distributed to them so that they may be able to maximise their wealth. Theoretically, when the company has an internal rate of return greater than the return required by shareholders, it would be to the advantage of shareholders to allow the reinvestment of earnings by the company. When the company does not have highly profitable opportunities and earns a rate on investment, which is lower than the rate required by shareholders, it is not in the interest of shareholders to retain earnings.

It is sometimes argued that, even if the company has highly profitable investment opportunities, earnings should be distributed and funds should be raised externally to finance the investment. This will exert a discipline on the company's management in proper deployment of funds. But companies in practice prefer to retain earnings because issuing new share capital is inconvenient as well as involves flotation costs. If the company raises debt, the financial obligations and risk will increase. As a matter of fact, directors may neither follow a practice of paying 100 per cent dividends, nor a practice of retaining 100 per cent earnings. The company may have a **target payout ratio** consistent with its investment opportunities and may like to achieve it slowly and steadily. In the absence of profitable investment opportunities, it can pay some 'extra' dividend, but still retaining some earnings for the continued existence of the enterprise. Though shareholders are the owners of the company and directors should follow a policy desired by them, yet they cannot sacrifice the interests of other groups, such as debt-holders, employees, society and customers. Shareholders are the residual claimants to the earnings of the company. Directors must retain some earnings, whether or not profitable investment opportunities exist, to *maintain* the company as a sound and solvent enterprise and to have financial flexibility. Only a financially sound and flexible company can discharge its debt obligations, provide monetary benefits to its employees, produce quality products for its customers and make social contributions by paying taxes and making donations.⁴

Thus, depending on the needs to finance their long-term investment opportunities, companies may follow different dividend policies. **Mature companies** that have fewer investment opportunities may generally have high payout ratios. Shareholders of these companies would be more interested in dividends, as they obtain higher return on their investments outside the company. The share prices of such companies are very sensitive to dividend changes. The directors of these companies retain only a small portion of the earnings to meet emergent financial needs and to finance the occasional investment opportunities and distribute the rest. **Growth companies**, on the other hand, have plenty of investment opportunities and hence, they may have low payout ratios. They are continuously in need of funds to finance their fast growing fixed assets. The distribution of earnings will reduce the funds of the company. Therefore, sometimes growth companies retain most of their earnings and issue bonus shares, regularly or from time to time, to

NOTES

satisfy the dividend needs of shareholders. These companies would slowly increase the amount of dividends as the profitable investment opportunities start fading.

10.3.2 Shareholders' Expectations

NOTES

Legally, the board of directors has discretion to decide the distribution of the earnings of a company. Shareholders are the legal owners of the company, and directors, appointed by them, are their agents. Therefore, directors should give due importance to the expectations of shareholders in the matter of dividend decision. Shareholders' preference for dividends or capital gains may depend on their economic status and the effect of tax differential on dividends and capital gains. In most countries, dividend income is taxed at a rate higher than the capital gains. A wealthy shareholder, in a high income-tax bracket, may be interested in capital gains than current dividends. On the other hand, a retired person with small means, whose main source of income is dividend, would like to get regular dividend and may not be interested in capital gains.⁵ The ownership concentration in a firm may define the shareholders' expectations.

In case of a **closely held company**, the body of the shareholders is small and homogeneous and management usually knows the expectations of shareholders. Therefore, they can easily adopt a dividend policy, which satisfies most shareholders. If most of the shareholders are in high tax brackets and have a preference for capital gains to current dividend incomes, the company can establish a dividend policy of paying sufficient dividends and retaining the earnings within the company, subject to its growth opportunities.

It is a formidable task to ascertain the preferences of shareholders in a **widely held company**. The number of shareholders is very large, they are dispersed and they may have diverse desires regarding dividends and capital gains. Hence it is not possible in case of widely held company to follow a dividend policy, which equally satisfies all shareholders. The firm may follow a dividend policy, which serves the purpose of the dominating group, but does not completely neglect the desires of others. Shareholders of a widely held company may be divided, for example, into four groups: small, retired, wealthy and institutional shareholders.⁶

Small shareholders are not the frequent purchasers of the shares. They hold a small number of shares in a few companies with the purpose of receiving dividend income, or sometimes making capital gains. They may not have a definite investment policy. They purchase shares only when their savings permit. **Retired and old persons** generally invest in shares to get a regular income. They use their savings or provident or pension funds to purchase shares. These persons may, therefore, select shares of the companies that have a history of paying regular and liberal dividends. However, a retired person who has some source of income and is in a high tax bracket may be interested in capital gains as well. **Wealthy investors** are very much concerned with the dividend policy followed by a company. They have a definite investment policy of increasing their wealth and minimising taxes. These persons are in high tax brackets and the dividends received in cash by them would be taxed at a high rate. Therefore, they generally prefer a dividend policy of retaining earnings and distributing bonus shares. The wealthy shareholders' group is quite dominating in many companies as they hold relatively large blocks of shares and are able to influence the composition of the board of directors by their significant voting rights. On the dividend policies of these companies, this group will have a considerable influence. **Institutional investors** purchase large blocks of shares to hold them for relatively long periods of time. Institutional investors,

unlike wealthy shareholders, are not concerned with personal income taxes but with profitable investments. Most institutional investors avoid speculative issues, seek diversification in their investment portfolio and favour a policy of regular cash dividend payments.

It should be obvious from the above discussion that, in the case of a widely held company, the interests of the various shareholders' groups are in conflict. It is not easy to reconcile these conflicting interests of the different types of shareholders. However, the board of directors should consider two points.⁷ First, the board should adopt a dividend policy, which gives some consideration to the interests of each of the groups comprising a substantial proportion of shareholders. Second, the dividend policy, once established, should be continued as long as it does not interfere with the financing needs of the company. A definite dividend policy, followed for a long period in the past, tends to create a particular kind of **clientele** for the company. That is, it attracts those investors who consider the dividend policy in accord with their investment requirements. If the company suddenly changes its dividend policy, it may work to the detriment of these shareholders, as they may have to switch to other companies to fulfil their investment needs. Thus, an established dividend policy should be changed slowly and only after having analysed its probable effects on the existing shareholders.

10.3.3 Constraints on Paying Dividends

Most companies recognise that the shareholders have some desire to receive dividends, although shareholders are also interested in the capital gains. How much dividend should a company pay? The company's decision regarding the amount of earnings to be distributed as dividends depends on legal and financial constraints.

Legal restrictions The dividend policy of the firm has to evolve within the legal framework and restrictions. The directors are not legally compelled to declare dividends. For example, the Indian Companies Act provides that dividend shall be declared or paid only out of the current profits or past profits after providing for depreciation. However, the Central Government is empowered to allow any company to pay dividend for any financial year out of the profits of the company without providing for depreciation. The Central Government shall give such relief only when it is in the public interest. The dividend should be paid in cash, but a company is not prohibited to capitalise profits or reserves (retained earnings) for the purpose of issuing fully paid bonus shares (stock dividend). It has been held in some legal cases that **capital profits** should not be distributed as dividends unless (i) the distribution is permitted by the company's Articles of Association and (ii) the profits have been actually realised.

The legal rules act as boundaries within which a company can operate in terms of paying dividends. Acting within these boundaries, a company will have to consider many financial variables and constraints in deciding the amount of earnings to be distributed as dividends.

Liquidity The payment of dividends means cash outflow. Although a firm may have adequate earnings to declare dividend, it may not have sufficient cash to pay dividends. Thus, the cash position of the firm is an important consideration in paying dividends; the greater the cash position and overall liquidity of a company, the greater will be its ability to pay dividends. A mature company is generally liquid and is able to pay large amount of dividends. It does not have much investment opportunities; much of its funds are not tied

NOTES

Check Your Progress

3. Should mature companies and growth companies follow the same dividend policies?
4. Can different types of shareholders have different types of dividend expectations?
5. What are the important variables affecting the firm's decision to pay dividends?

NOTES

up in permanent working capital and, therefore, it has a sound cash position. On the other hand, growing firms face the problem of liquidity. Even though they make good profits, they continuously need funds for financing growing fixed assets and working capital. Because of the insufficient cash or pressures on liquidity, in case of growth firms, management may follow a conservative dividend policy.

Financial condition and borrowing capacity: The financial condition or capability of a firm depends on its use of borrowings and interest charges payable. A high degree of financial leverage makes a company quite vulnerable to changes in earnings, and also, it becomes quite difficult to raise funds externally for financing its growth. A highly levered firm is, therefore, expected to retain more to strengthen its equity base. However, a company with steady growing earnings and cash flows and without much investment opportunities, may follow a high dividend payment policy in spite of high amount of debt in its capital structure. A growth firm lacking liquidity may borrow to pay dividends. But this is not a sound policy. This will adversely affect the firm's financial flexibility. Financial flexibility includes the firm's ability to access external funds at a later date. The firm may lose the flexibility and capacity of raising external funds to finance growth opportunities in the future.

Access to the capital market: A company that is not sufficiently liquid can still pay dividends if it is able to raise debt or equity in the capital markets. If it is well established and has a record of profitability, it will not find much difficulty in raising funds in the capital markets. Easy accessibility to the capital markets provides flexibility to the management in paying dividends as well as in meeting the corporate obligations. A fast growing firm, which has a tight liquidity position, will not face any difficulty in paying dividends if it has access to the capital markets. A company that does not have sound cash position and it is also unable to raise funds, will not be able to pay dividends. Thus, the greater is the ability of the firm to raise funds in the capital markets, greater will be its ability to pay dividends even if it is not liquid.

Restrictions in loan agreements: Lenders may generally put restrictions on dividend payments to protect their interests when the firm is experiencing low liquidity or low profitability. As such, the firm agrees as part of a contract with a lender to restrict dividend payments. For example, a loan agreement may prohibit payment of dividends as long as the firm's debt-equity ratio is in excess of, say, 1.5:1 or when the liquidity ratio is less than, say, 2:1 or may require the firm to pay dividends only when some amount of current earnings has been transferred to a sinking fund established to retire debt. These are some of the examples of the restrictions put by lenders on the payment of dividends. When these restrictions are put, the company is forced to retain earnings and have a low payout.

Inflation: Inflation can act as a constraint on paying dividends. Our accounting system is based on historical costs. Depreciation is charged on the basis of original costs at which assets were acquired. As a result, when prices rise, funds equal to depreciation set aside would not be adequate to replace assets or to maintain the capital intact. Consequently, to maintain the capital intact and preserve their earnings power, firms earnings may avoid paying dividends. On the contrary, some companies may follow a policy of paying more dividends during high inflation in order to protect the shareholders from the erosion of the real value of dividends. Companies with falling or constant profits may not be able to follow this policy.

Control: The objective of maintaining control over the company by the existing management group or the body of shareholders can be an important variable in influencing

the company's dividend policy. When a company pays large dividends, its cash position is affected. As a result, the company will have to issue new shares to raise funds to finance its investment programmes. The control of the existing shareholders will be diluted if they do not want or cannot buy additional shares. Under these circumstances, the payment of dividends may be withheld and earnings may be retained to finance the firm's investment opportunities.

NOTES

10.4 STABILITY OF DIVIDENDS

Stability of dividends is considered a desirable policy by the management of most companies in practice. Shareholders also seem generally to favour this policy and value stable dividends higher than the fluctuating ones. All other things being the same, the stable dividend policy may have a positive impact on the market price of the share.

Stability of dividends also means regularity in paying some dividend annually, even though the amount of dividend may fluctuate over years, and may not be related with earnings. There are a number of companies, which have records of paying dividend for a long, unbroken period. More precisely, stability of dividends refers to the amounts paid out regularly. Three forms of such stability may be distinguished:

- Constant dividend per share or dividend rate
- Constant payout
- Constant dividend per share plus extra dividend

10.4.1 Constant Dividend Per Share or Dividend Rate

In India, companies announce dividend as a per cent of the paid-up capital per share. This can be converted into dividend per share. A number of companies follow the policy of paying a fixed amount per share or a fixed rate on paid-up capital as dividend every year, irrespective of the fluctuations in the earnings. This policy does not imply that the dividend per share or dividend rate will never be increased. When the company reaches new levels of earnings and expects to maintain them, the annual dividend per share or dividend rate may be increased. The earnings per share and the dividend per share relationship under this policy is shown in Figure 10.1.

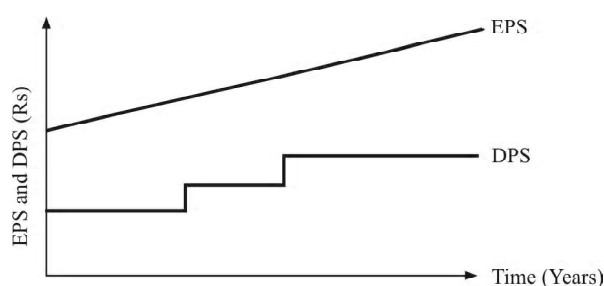


Fig. 10.1 Constant Dividend Per Share Policy

It is easy to follow this policy when earnings are stable. However, if the earnings pattern of a company shows wide fluctuations, it is difficult to maintain such a policy. With earnings fluctuating from year to year, it is essential for a company, which wants to follow this policy to build up surpluses in years of higher than average earnings to maintain dividends in years of below average earnings. In practice, when a company retains earnings in good years for this purpose, it earmarks this surplus as **dividend equalisation**

NOTES

reserve. These funds are invested in current assets like tradable (marketable) securities, so that they may easily be converted into cash at the time of paying dividends in bad years.

A constant dividend per share policy puts ordinary shareholders at par with preference shareholders irrespective of the firm's investment opportunities or the preferences of shareholders.⁸ Those investors who have dividends as the only source of their income may prefer the constant dividend policy. They do not accord much importance to the changes in share prices. In the long run, this may help to stabilise the market price of the share.⁹

10.4.2 Constant Payout

The ratio of dividend to earnings is known as **payout ratio**. Some companies may follow a policy of constant payout ratio, i.e., paying a fixed per centage of net earnings every year. With this policy the amount of dividend will fluctuate in direct proportion to earnings. If a company adopts a 40 per cent payout ratio, then 40 per cent of every rupee of net earnings will be paid out. For example, if the company earns ₹ 2 per share, the dividend per share will be Re 0.80 and if it earns ₹ 1.50 per share the dividend per share will be Re 0.60. The relation between the earnings per share and the dividend per share under this policy is exhibited in Figure 10.2.

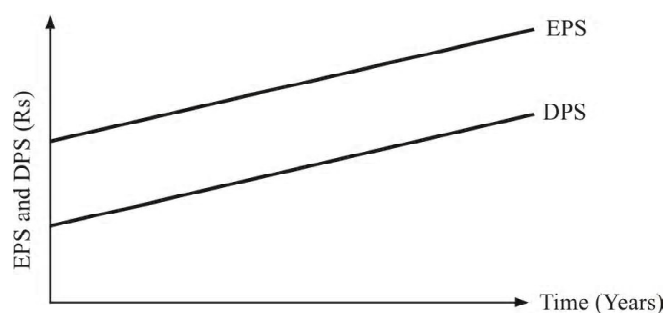


Fig. 10.2 Dividend Policy of Constant Payout Ratio

This policy is related to a company's ability to pay dividends. If the company incurs losses, no dividends shall be paid regardless of the desires of shareholders. Internal financing with retained earnings is automatic when this policy is followed. At any given payout ratio, the amount of dividends and the additions to retained earnings increase with increasing earnings and decrease with decreasing earnings. This policy does not put any pressure on a company's liquidity since dividends are distributed only when the company has profits.¹⁰

10.4.3 Constant Dividend Per Share Plus Extra Dividend

For companies with fluctuating earnings, the policy to pay a minimum dividend per share with a step-up feature is desirable. The small amount of dividend per share is fixed to reduce the possibility of ever missing a dividend payment. By paying extra dividend (a number of companies in India pay an **interim dividend** followed by a regular, **final dividend**) in periods of prosperity, an attempt is made to prevent investors from expecting that the dividend represents an increase in the established dividend amount. This type of policy enables a company to pay constant amount of dividend regularly without a default and allows a great deal of flexibility for supplementing the income of shareholders only when the company's earnings are higher than the usual, without committing itself to

Check Your Progress

6. Should a company follow a stable dividend policy? What are advantages and disadvantages of following such a policy?
7. What is the danger in adopting a stable dividend policy?

make larger payments as a part of the future fixed dividend. Certain shareholders like this policy because of the certain cash flow in the form of regular dividend and the option of earning extra dividend occasionally.

We have discussed three forms of stability of dividends. Generally, when we refer to a stable dividend policy, we refer to the first form of paying constant dividend per share. A firm pursuing a policy of stable dividend, as shown in Figure 10.1, may command a higher price for its shares than a firm, which varies dividend amount with cyclical fluctuations in the earnings as depicted in Figure 10.2.

10.4.4 Merits of Stability of Dividends

The stability of dividends has several advantages as discussed below:

- Resolution of investors' uncertainty.
- Investors' desire for current income.
- Institutional investors' requirements.
- Raising additional finances.

Resolution of investors' uncertainty: We have argued in the previous chapter that dividends have informational value, and resolve uncertainty in the minds of investors. When a company follows a policy of stable dividends, it will not change the amount of dividends if there are temporary changes in its earnings. Thus, when the earnings of a company fall and it continues to pay same amount of dividend as in the past, it conveys to investors that the future of the company is brighter than suggested by the drop in earnings. Similarly, the amount of dividends is increased with increased earnings level only when it is possible to maintain it in future. On the other hand, if a company follows a policy of changing dividends with cyclical changes in the earnings, shareholders would not be certain about the amount of dividends.

Investors' desire for current income: There are many investors, such as old and retired persons, women etc., who desire to receive regular periodic income. They invest their savings in the shares with a view to use dividends as a source of income to meet their living expenses. Dividends are like wages and salaries for them. These investors will prefer a company with stable dividends to the one with fluctuating dividends.

Institutional investors' requirements Financial, educational and social institutions and unit trusts also invest funds in shares of companies. In India, financial institutions such as IFCI, IDBI, LIC, and UTI are some of the largest investors in corporate securities. Every company is interested to have these financial institutions in the list of their investors. These institutions may generally invest in the shares of those companies, which have a record of paying regular dividends. These institutional investors may not prefer a company, which has a history of adopting an erratic dividend policy. Thus, to cater the requirement of institutional investors, a company prefers to follow a stable dividend policy.

Raising additional finances: A stable dividend policy is also advantageous to the company in its efforts to raise external finances. Stable and regular dividend policy tends to make the share of a company as quality investment rather than a speculation. Investors purchasing these shares intend to hold them for long periods of time. The loyalty and goodwill of shareholders towards a company increases with stable dividend policy. They would be more receptive to an offer by the company for further issues of shares. A history of stable dividends serves to spread ownership of outstanding shares more widely among small investors, and thereby reduces the chance of loss of control. The persons

NOTES

Check Your Progress

8. What were Lintner's main findings in his study of US companies with regard to their dividend policies?

NOTES

with small means, in the hope of supplementing their income, usually purchase shares of the companies with a history of paying regular dividends. A stable dividend policy also helps the sale of debentures and preference shares. The fact that the company has been paying dividend regularly in the past is a sufficient assurance to the purchasers of these securities that no default will be made by the company in paying their interest or preference dividend and returning the principal sum. The financial institutions are the largest purchasers of these securities. They purchase debentures and preference shares of those companies, which have a history of paying stable dividends.

10.4.5 Danger of Stability of Dividends

The greatest danger in adopting a stable dividend policy is that once it is established, it cannot be changed without seriously affecting investors' attitude and the financial standing of the company. If a company, with a pattern of stable dividends, misses dividend payment in a year, this break will have an effect on investors more severe than the failure to pay dividend by a company with unstable dividend policy. The companies with stable dividend policy create a 'clientele' that depends on dividend income to meet their living and operating expenses. A cut in dividend is considered as a cut in 'salary.' Because of the serious depressing effect on investors due to a dividend cut, directors have to maintain stability of dividends during lean years even though financial prudence would indicate elimination of dividends or a cut in it. Consequently, to be on the safe side, the dividend rate should be fixed at a conservative figure so that it may be possible to maintain it even in lean periods of several years. To give the benefit of the company's prosperity, extra or interim dividend, can be declared. When a company fails to pay extra dividend, it does not have a depressing effect on investors as the failure to pay a regular dividend does.

10.5 TARGET PAYOUT AND DIVIDEND SMOOTHING: LINTNER'S MODEL OF CORPORATE DIVIDEND BEHAVIOUR

We have discussed stability of dividends in terms of stable dividends per share (or dividend rate) and stable payout ratio. A stable payout ratio results into fluctuating dividend per share pattern, which could be a cause of uncertainty for investors. In practice, firms express their dividend policy either in terms of dividend per share or dividend rate. Does this mean that payout ratio is not considered important by firms while determining their dividend policies? Lintner,¹¹ in his study of American companies, found that firms generally think in terms of proportion of earnings to be paid out. Investment requirements are not considered for modifying the pattern of dividend behaviour. Thus firms generally have target payout ratios in view while determining change in dividend per share (or dividend rate).

What are the perceptions of managers of companies in India about the payment of dividends? A study¹² shows that managers are strongly in favour of companies regularly paying dividends and striving to move towards a target payout. The dividend policy should be stable, and should be changed only when it can be maintained in the future. Managers feel that current dividends depend on current earnings, the future earnings potential as well as on dividends paid in the previous year. Dividends must be paid even when a company needs funds for undertaking profitable investment projects.

How can Lintner's model be expressed in formal terms? Let us assume that a firm has EPS_1 , as the expected earnings per share in year 1, and p as the target payout ratio. If the firm strictly follows stable payout policy, the expected dividend per share, DIV_1 will be:

$$DIV_1 = pEPS_1 \quad (1)$$

and dividend *change* (as compared to the dividend per share for the previous year, DIV_0) will be:

$$DIV_1 - DIV_0 = pEPS_1 - DIV_0 \quad (2)$$

But, in practice, firms do not change the dividend per share (or dividend rate) immediately with change in the earnings per share. Shareholders like a steadily growing dividend per share. Thus, firms change their dividends slowly and gradually even when there are large increases in earnings. This implies that firms have standards regarding the *speed* with which they attempt to move towards the full adjustment of payout to earnings. Lintner has, therefore, suggested the following formula to explain the change in dividends of firms in practice:

$$DIV_1 - DIV_0 = b(pEPS_1 - DIV_0) \quad (3)$$

where b is the **speed of adjustment**. A conservative company will move slowly towards its **target payout**.

The implications of Equation (3) are (i) that firms establish their dividends in accordance with the level of current earnings, and (ii) that the changes in dividends over time do not correspond exactly with changes in earnings in the immediate time period. In other words, the expected dividend per share (DIV_1) depends on the firm's current earnings (EPS_1) as well as the dividend per share of the previous year (DIV_0); the previous year's dividend per share (DIV_0) depends on that year's earnings per share (EPS_0) and the dividend per share in the year before (DIV_{-1}).

Lintner's model can be expressed in the form of the following regression equation:

$$\begin{aligned} DIV_t - DIV_{t-1} &= a + b(pEPS_t - DIV_{t-1}) + e_t \\ DIV_t &= a + bpEPS_t - bDIV_{t-1} + DIV_{t-1} + e_t \\ DIV_t &= a + bDIV_{t-1}^* + (1 - b)DIV_{t-1} + e_t \end{aligned} \quad (4)$$

where DIV_t is the dividend per share in year t , b is the adjustment factor, $DIV_t^* = pEPS_t$ is desired dividend per share, p is the target payout ratio; DIV_{t-1} is dividend per share in year $t - 1$ and e is the error term.¹³

We can interpret the term $(1 - b)$ as a **safety factor** that the management observes by not increasing the dividend payment to the levels where it cannot be maintained. Together coefficients a and b can be used to test the hypothesis that management is more likely to increase dividend over time rather than cut them.

10.6 FORMS OF DIVIDENDS

The usual practice is to pay dividends in cash. Other options are payment of the **bonus shares** (referred to as **stock dividend** in USA) and **shares buyback**. In this section, we shall also discuss **share split**. The share (stock) split is not a form of dividend; but its effects are similar to the effects of the bonus shares.

NOTES

NOTES

10.6.1 Cash Dividend

Companies mostly pay dividends in cash. A company should have enough cash in its bank account when cash dividends are declared. If it does not have enough bank balance, arrangement should be made to borrow funds. When the company follows a stable dividend policy, it should prepare a cash budget for the coming period to indicate the necessary funds, which would be needed to meet the regular dividend payments of the company. It is relatively difficult to make cash planning in anticipation of dividend needs when an unstable policy is followed.

The cash account and the reserves account of a company will be reduced when the cash dividend is paid. Thus, both the total assets and the net worth of the company are reduced when the cash dividend is distributed. The market price of the share drops in most cases by the amount of the cash dividend distributed.¹⁴

10.6.2 Bonus Shares

An issue of **bonus shares** is the distribution of shares free of cost to the existing shareholders. In India, bonus shares are issued in addition to the cash dividend and not in lieu of cash dividend. Hence companies in India may supplement cash dividend by bonus issues. Issuing bonus shares increases the number of outstanding shares of the company. The bonus shares are distributed proportionately to the existing shareholder. Hence there is no dilution of ownership. For example, if a shareholder owns 100 shares at the time when a 10 per cent (i.e., 1:10) bonus issue is made, she will receive 10 additional shares. The declaration of the bonus shares will increase the paid-up share capital and reduce the reserves and surplus (retained earnings) of the company. The total net worth (paid-up capital plus reserves and surplus) is not affected by the bonus issue. In fact, a bonus issue represents a recapitalisation of reserves and surplus. It is merely an accounting transfer from reserves and surplus to paid-up capital. The following example illustrates this point.

Illustration 10.1: The Effect of Bonus Share

The following is the capital structure of Walchand Sons & Company

Walchand pays bonus shares in 1:10 ratio. At the time of the issue of bonus shares, the market price per share is ₹ 30. The bonus shares are issued at the market price - a premium of ₹ 20 over the face value of ₹ 10 each share.

	₹ in crore
Paid-up share capital (1 crore shares, ₹ 10 par)	10
Share premium	15
Reserves and surpluses	8
Total net worth	33

A 1:10 bonus issue implies an issue of 10 lakh new shares to the existing shareholders. Thus, a shareholder holding 10 shares shall get one additional share. At a price of ₹ 30 per share, the total value of new shares issued will be ₹ 3 crore. This amount would be transferred from the reserves and surplus account into the paid-up share capital account and the share premium account. The share capital account will be increased by ₹ 1 crore (10 lakh × ₹ 10) and the remaining ₹ 2 crore will be transferred to the share premium account. The new capitalisation will be as follows:

	₹ in crore
Paid-up share capital (1.10 crore shares, ₹ 10 par)	11
Share premium	17
Reserves and surpluses	5
Total net worth	33

NOTES

Notice that the total net worth of the company does not change by the bonus shares; only the balance of the paid-up share capital is readjusted.

Does the issue of bonus shares increase the wealth of shareholders? Normatively speaking, the issue of bonus shares does not affect the wealth of shareholders. The earnings per share and market price per share will fall proportionately to the bonus issue. For example, as a result of increasing the number of shares by 10 per cent, the earnings per share of Walchand Company will decrease by 10 per cent. The market price per share will also fall by 10 per cent, all other things being equal. Suppose the net earnings of the company are ₹ 2.20 crore. The earnings per share before the declaration of the bonus issue is ₹ 2.20 (₹ 2.20 crore/1.00 crore) and after the bonus shares, the earnings per share are ₹ 2 (₹ 2.20 crore/1.10 crore). However, the proportional earnings of shareholders will remain unchanged. Thus, the total earnings of a shareholder holding 100 shares before the bonus shares is ₹ 220 (₹ 2.20 × 100) and his total earning will still be ₹ 220 after the bonus issue (₹ 2.00 × 110). Similarly, the market price per share will drop by ₹ 2.73; that is, ₹ 30 (1 – 1.00/1.10). The total market value of the shareholder's holdings after the bonus shares is ₹ 3,000 (₹ 27.27 × 110), same as the total value before the bonus shares. Thus, the bonus shares have no impact on the wealth of shareholders. In practice, it is observed that, immediately after the announcement of bonus issue, the market price of a company's share changes depending on the investor's expectations. Sometimes a sharp decline in the share price may be observed if the bonus issue falls short of the investors' expectation.

It may be emphasised here that the market value of the share may improve as a result of the bonus issue if it is followed by increased dividends in the immediate future. If the dividends do not increase, it is likely that the market price may fall. This is confirmed by an empirical study conducted under the Indian context.¹⁵

10.6.3 Advantages of Bonus Shares

Prima facie the bonus shares do not affect the wealth of the shareholders. In practice, however, they carry certain advantages both for shareholders and the company.¹⁶

Shareholders: The following are advantages of the bonus shares to shareholders:

Tax benefit: One of the advantages to shareholders in the receipt of bonus shares is the beneficial treatment of such dividends with regard to income taxes. When a shareholder receives cash dividend from company, this is included in his ordinary income and taxed at ordinary income tax rate. But the receipt of bonus shares by the shareholder is not taxable as income. Further, the shareholder can sell the new shares received by way of the bonus issue to satisfy his desire for income and pay capital gain taxes, which are usually less than the income taxes on the cash dividends. The shareholder could sell a few shares of his original holding to derive capital gains. But selling the original shares are considered as a sale of asset by some shareholders. They do not mind selling the shares received by way of the bonus shares as they consider it a windfall gain and not a

NOTES

part of the principal. Note that in India as per the current law investors do not pay any taxes on dividends but they have to pay tax on capital gains. Hence, the Indian law makes bonus shares less attractive than dividends.

Indication of higher future profits: The issue of bonus shares is normally interpreted by shareholders as an indication of higher profitability. When the profits of a company do not rise, and it declares a bonus issue, the company will experience a dilution of earnings as a result of the additional shares outstanding. Since a dilution of earnings is not desirable, directors usually declare bonus shares only when they expect rise in earnings to offset the additional outstanding shares. Bonus shares, thus, may convey some information that may have a favourable impact on value of the shares. But it should be noticed that the impact on value is that of the growth expectation and not the bonus shares per se.

Future dividends may increase: If a company has been following a policy of paying a fixed amount of dividend per share and continues it after the declaration of the bonus issue, the total cash dividends of the shareholders will increase in the future. For example, a company may be paying a Re 1 dividend per share and pays 1:1 bonus shares with the announcement that the cash dividend per share will remain unchanged. If a shareholder originally held 100 shares, he will receive additional 100 shares. His total cash dividend in future will be ₹ 200 ($₹ 1 \times 200$) instead of ₹ 100 ($₹ 1 \times 100$) received in the past. The increase in the shareholders' cash dividend may have a favourable effect on the value of the share. It should be, however, realised that the bonus issue per se has no effect on the value of the share; it is the increase in earnings from the company's invests that affects the value.

Psychological value: The declaration of the bonus issue may have a favourable psychological effect on shareholders. The receipt of bonus shares gives them a chance to sell the shares to make capital gains without impairing their principal investment. They also associate it with the prosperity of the company. Because of these positive aspects of the bonus issue, the market usually receives it positively. The sale of the shares, received by way of the bonus shares, by some shareholders widens the distribution of the company's shares. This tends to increase the market interest in the company's shares; thus supporting or raising its market price.

Company: Bonus shares are also advantageous to the company. The advantages are:

- **Conservation of cash:** The declaration of a bonus issue allows the company to declare a dividend without using up cash that may be needed to finance the profitable investment opportunities within the company. The company is, thus, able to retain earnings and at the same time satisfy the desires of shareholders to receive dividend. We have stated earlier that directors of a company must consider the financial needs of the company and the desires of shareholders while making the dividend decision. These two objectives are often in conflict. The use of bonus issue represents a compromise which enables directors to achieve both these objectives of a dividend policy. The company could retain earnings without declaring bonus shares issue. But the receipt of bonus shares satisfies shareholders psychologically. Also, their total cash dividend can increase in future, when cash dividend per share remains the same. Note that in India, bonus shares cannot be issued in lieu of dividends; hence the cash conservation argument for issuing bonus shares is not a strong argument.
- **Only means to pay dividend under financial difficulty and contractual restrictions:** In some situations, even if the company's intention is not to retain

Check Your Progress

9. What are the major ways of making payments to shareholders?
10. What is the effect of issuing bonus shares to existing shareholders? What are the advantages?
11. Write a brief note on bonus shares?
12. What are the various forms of dividends?

earnings, the bonus issue (with a small amount of dividend) is the only means to pay dividends and satisfy the desires of shareholders. When a company is facing a stringent cash situation, the only way to replace or reduce cash dividend is the issue of bonus shares. The declaration of the bonus issue under such a situation should not convey a message of the company's profitability, but financial difficulty. The declaration of the bonus issue is also necessitated when the restrictions to pay the cash dividend are put under loan agreements. Thus, under the situations of financial stringency or contractual constrain in paying cash dividend, the bonus issue is meant to maintain the confidence of shareholders in the company.

- **More attractive share price:** Sometimes the intention of a company in issuing bonus shares is to reduce the market price of the share and make it more attractive to investors. If the market price of a company's share is very high, it may not appeal to small investors. If the price could be brought down to a desired range, the trading activity would increase. Therefore, the bonus issue is used as a means to keep the market price of the share within a desired trading range. As we shall discuss below, this objective can also be achieved by share split.

10.6.4 Limitations of Bonus Shares

Bonus shares have the following limitations:

- Shareholders' wealth remains unaffected
- Costly to administer
- Problem of adjusting EPS and P/E ratio

Bonus shares are considered valuable by most shareholders. But they fail to realise that the bonus shares do not affect their wealth and therefore, in itself it has no value for them. The declaration of bonus shares is a method of capitalising the past earnings of the shareholders. Thus, it is a formal way of recognising something (earnings), which the shareholders already own. It merely divides the ownership of the company into a large number of share certificates. Bonus shares represent simply a division of corporate pie into a large number of pieces.¹⁷ In fact, the bonus issue does not give any extra or special benefit to a shareholder. His proportionate ownership in the company does not change. The chief advantage of the bonus share issue is that it has a favourable psychological impact on shareholders. The issue of bonus shares gives an indication of the company's growth to shareholders. Shareholders welcome the distribution of bonus shares since it has informational value.

The disadvantage of bonus issues from the company's point of view is that they are *more costly to administer* than cash dividend.¹⁸ The company has to now print certificates and post them to thousands of shareholders. The bonus issue can be disadvantageous if the company declares periodic small bonus shares. The investment analysts do not adjust the earnings per share for small issues of bonus shares. They adjust only the significant issues of bonus shares. When the earnings per share are not adjusted, the measured growth in the earnings per share will be less than the true growth based on the adjusted earnings per share. As a result the price-earnings ratio would be distorted downwards.

10.6.5 Conditions for the Issue of Bonus Shares

In India, bonus shares are issued in addition to, and not in lieu of, cash dividends. A company is not allowed to declare bonus shares unless partly paid-up shares have been

NOTES

Check Your Progress

13. What is meant by a share split? What are the advantages of a share split?
14. Discuss in brief some of the main reasons for share splitting?

NOTES

converted into fully paid-up shares. Bonus shares are made out of share premium and free reserve, which includes investment allowance reserve but excludes capital reserve on account of assets revaluation. In no time the amount of bonus issue should exceed the paid-up capital. A company can declare bonus shares once in a year. The company's shareholders should pass a resolution approving the proposal of the bonus issue, clearly indicating the rate of dividend is payable on the increased capital. Company intending to issue bonus shares should not be in default of payments of statutory dues to employees and term loans to financial institutions.

The maximum bonus shares ratio is 1:1; that is, one bonus share for one fully paid-up share held by the existing shareholders. However, two criteria are required to be satisfied within the limit of the maximum ratio. They are:

- Residual reserve criterion
- Profitability criterion.

Residual reserve criterion: It requires that reserve remaining after the amount capitalised for bonus issue should be at least equal to 40 per cent of the increased paid-up capital. Redemption reserve and capital reserve on account of assets revaluation are excluded while investment allowance reserve is included in computing the minimum residual reserve. This criterion can be expressed as follows:

$$\begin{aligned} & (\text{Pre-bonus reserve}) - \text{Pre-bonus paid-up capital} \\ & \times \text{Bonus ratio} \geq 0.4 (1 + \text{Bonus ratio}) \\ & \times \text{Pre-bonus paid-up capital} \end{aligned} \quad (5)$$

Profitability criterion: It requires that 30 per cent of the previous three years' average pre-tax profit (PBT) should be at least equal to 10 per cent of the *increased* paid-up capital. This criterion can be expressed as follows:

$$\begin{aligned} & 0.3 \times \text{three year average PBT} \geq 0.1 (1 + \text{bonus ratio}) \\ & \times \text{pre-bonus paid-up capital} \end{aligned}$$

Consider an example. A company has the following data:

	₹
Paid-up share capital	80
Reserves	100
Net worth	180
Average PBT of previous three years	50

We can plug these data respectively in Equations (1) and (2) as follows to determine the maximum bonus ratio:

Residual reserve criterion

$$\begin{aligned} & 100 - (80 \times \text{Bonus ratio}) \geq 0.4(1 + \text{Bonus ratio}) \times 80 \\ & 100 - (80 \times \text{Bonus ratio}) \geq 32 + 32 \times \text{Bonus ratio} \\ & 68 \geq 112 \times \text{Bonus ratio} \\ & 68/112 \geq \text{Bonus ratio or } 17:28 \text{ Bonus ratio} \end{aligned}$$

Profitability criterion

$$\begin{aligned}0.3 \times 50 &\geq 0.1(1 + \text{Bonus ratio}) \times 80 \\15 &\geq 8 + 8 \times \text{Bonus share} \\7 &\geq 8 \times \text{Bonus ratio} \\7/8 &\geq \text{Bonus ratio or } 7 : 8 \text{ Bonus ratio}\end{aligned}$$

Note that 68/112 is less than 7/8. Therefore, the company will be allowed to declare bonus issue in the ratio of 68:112 (or 17:28). The increased paid-up capital and residual reserve will be as follows:

	₹
Paid-up share capital (80 + 80 × 17/28)	128.57
Reserve (100 – 80 × 17/28)	51.43
	180.00

You may notice that residual reserve (₹ 51.43) is 40 per cent of the increased paid-up capital (₹ 128.57).

10.7 SHARE SPLIT

A **share split** is a method to increase the number of outstanding shares through a proportional reduction in the par value of the share. A share split affects only the par value and the number of outstanding shares; the shareholders' total funds remain unaltered. Consider an example. The following is the capital structure of Walchand Sons & Company

	₹
Paid-up share capital (1 crore ₹ 10 par)	10
Share premium	15
Reserves and surplus	8
Total net worth	33

Walchand Company split their shares two-for-one. The capitalisation of the company after the split is as follows:

	₹
Paid-up share capital (2 crore ₹ 5 par)	10
Share premium	15
Reserves and surplus	8
Total net worth	33

10.7.1 Bonus Share vs. Share Split

As with the bonus share the total net worth does not change and the number of outstanding shares increases substantially with the share split. The bonus issue and the share split are similar except for the difference in their accounting treatment. In the case of bonus shares, the balance of the reserves and surpluses account decreases due to a transfer to the paid-up capital and the share premium accounts. The par value per share remains

NOTES

NOTES

unaffected. With a share split, the balance of the equity accounts does not change, but the par value per share changes. The earnings per share will be diluted and the market price per share will fall proportionately with a share split. But the total value of the holdings of a shareholder remains unaffected with a share split.

10.7.2 Reasons for Share Split

The following are reasons for splitting of a firm's ordinary shares:¹⁹

- To make trading in shares attractive
- To signal the possibility of higher profits in the future
- To give higher dividends to shareholders

To make shares attractive: The main purpose of a stock split is to reduce the market price of the share in order to make it attractive to investors. With reduction in the market price of the share, the shares of the company are placed in a more popular trading range. For example, if the shares of a company are sold in the lots of 100 shares, it requires ₹ 10,000 to buy 100 shares selling for ₹ 100 per share. A five-for-one split would lower the price to ₹ 20 per share and the total cost of 100 shares to ₹ 2,000. The wealthy investor can still purchase shares of ₹ 10,000 by acquiring a larger number of shares (500 share at ₹ 20). But a small investor can also afford to buy 100 shares for ₹ 2,000 for which she otherwise needed ₹ 10,000 before the split. Thus, the reduction in the market price, caused by the share split, motivates more investors, particularly those with small savings, to purchase the shares. This helps in increasing the marketability and liquidity of a company's shares.

Indication of higher future profits: The share splits are used by the company management to communicate to investors that the company is expected to earn higher profits in future. The market price of high-growth firm's shares increases very fast. If the shares are not split periodically, they fall outside the popular trading range. Therefore, these companies resort to share splits from time to time. The share split like bonus shares, thus, has an informational value that the firm is expected to perform efficiently and profitably and that the shares have been split to avoid future high price per share.

Increased dividend: When the share is split, seldom does a company reduce or increase the cash dividend per share proportionately. However, the total dividends of a shareholder increase after a share split. For example, a company may be paying a cash dividend of ₹ 3 per share before the share split. But after a split of three-of-one, the company may pay a cash dividend of ₹ 1.50 per share. A shareholder holding 100 shares before the split will receive a total cash dividend of ₹ 300. The number of shares owned by the shareholder will increase to 300 after the split and his total cash dividend will be ₹ 450. The increased dividends may favourably affect the after-split market price of the share. It should be noted that the share split per se has no effect on the market price of share.

10.7.3 Reverse Split

Under the situation of falling price of a company's share, the company may want to reduce the number of outstanding shares to prop up the market price per share. The reduction of the number of outstanding shares by increasing per share par value is known as a **reverse split**. For example, a company has 20 lakh outstanding shares of ₹ 5 par value per share. Suppose it declares a reverse split of one-for-four. After the split, it will have 5 lakh shares of ₹ 20 par value per share. The reverse split is sometimes

used to stop the market price per share below a certain level, say, ₹ 10 per share which is par value of most shares in India. The reverse split is generally an indication of financial difficulty, and is, therefore, intended to increase the market price per share.²⁰

10.8 DIVIDEND POLICY ANALYSIS: CASE OF (L&T) LIMITED

We have already analysed in earlier chapters L&T's cost of capital and capital structure, respectively. In this section, we shall analyse L&T's dividend policy. Table 10.1 provides financial data for L&T from the year 1990 to the year 2003.

Table 10.1 L&T's EPS, DPS and other financial data

Year	EPS ₹	DPS ₹	Payout %	P/E times	DY %	EY %	Price ₹
Mar-90	6.3	2.3	37.2	13.0	3.1	7.7	82.0
Mar-91	9.4	3.0	31.8	12.0	2.7	8.3	112.5
Mar-92	7.8	2.4	30.8	49.9	0.9	2.0	390.1
Mar-93	5.6	3.3	57.6	31.5	2.0	3.2	177.7
Mar-94	9.2	4.0	44.0	29.4	1.5	3.4	269.9
Mar-95	12.1	4.8	39.5	21.5	1.9	4.7	259.9
Mar-96	13.4	5.6	41.4	18.0	2.5	5.6	242.1
Mar-97	16.6	6.0	36.3	12.1	3.0	8.3	199.9
Mar-98	21.4	6.5	30.4	11.4	2.7	8.8	243.0
Mar-99	18.9	6.5	34.4	12.4	2.8	8.1	233.9
Mar-00	13.7	6.5	47.4	20.9	2.3	4.8	287.4
Mar-01	8.9	6.5	73.5	25.0	2.9	4.0	221.2
Mar-02	16.5	7.0	42.5	11.0	3.9	9.1	180.8
Mar-03	17.4	7.5	43.1	10.6	4.1	9.4	184.7
Average	12.7	5.1	42.2	19.9	2.6	6.2	220.4

Behaviour of EPS, DPS and payout L&T's EPS has grown faster than its DPS. EPS has shown wide fluctuations, while DPS has been slowly and steadily growing (Figure 10.3).

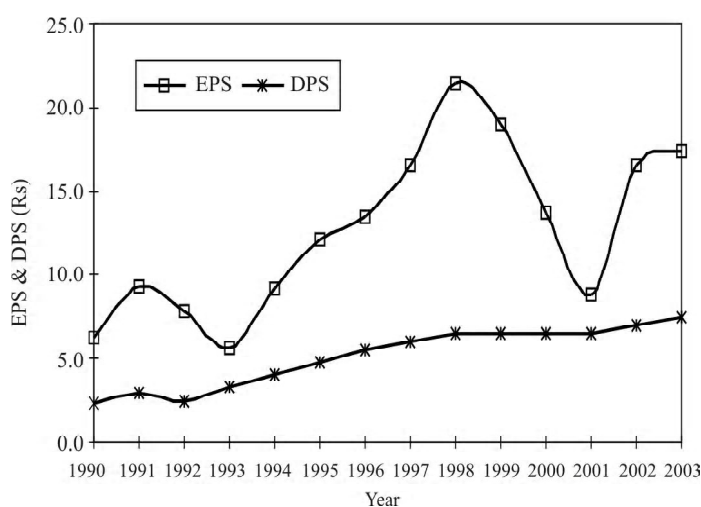


Fig. 10.3 L&T's EPS and DPS during 1990–2003

NOTES

NOTES

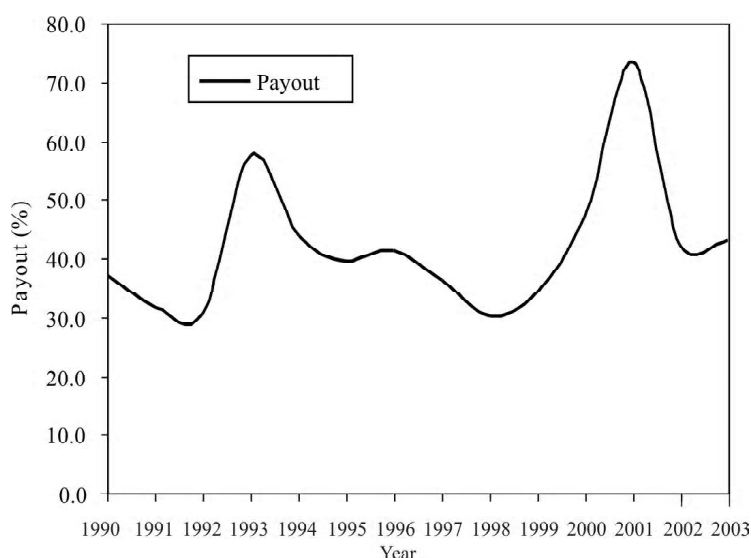


Fig. 10.4 L&T's Payout Ratio, 1990–2003

Consequently, dividend payout ratio shows wide variations—ranging between 30 per cent in 1992 to 74 per cent in 2001 (Figure 10.4). The average payout during 1990 to 2003 is 42 per cent.

Behaviour of share price Figure 10.5 shows that L&T's share price after reaching peak in 1992 (the year of stock scam in India), has been fluctuating within a narrow range. There does seem to be significant correlation between L&T's share price and EPS or DPS or payout ratio.

Earnings and dividend yields L&T's dividend yield declined from 1990 to 1993, and after that, it has been increasing except in 1994 and 2000. It has, however, remained below 3 per cent. The average dividend yield from 1990 to 2003 is 2.6 per cent. L&T's earnings yield showed a high degree of variability (Figure 10.6). It peaked to 9.4 per cent in 2003. The average earnings yield during 1990 to 2003 was 6.2 per cent.

Target payout We can use Lintner's model to explain L&T's dividend behaviour. We obtained the following results when we regressed DIV_t (we use the term DIV for DPS) with EPS_t and DIV_{t-1} .

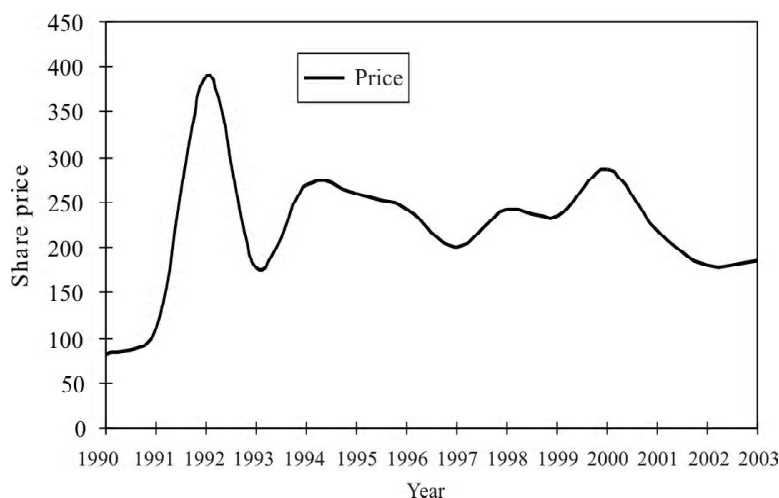


Fig. 10.5 L&T's Share Price Behaviour, 1990–2003

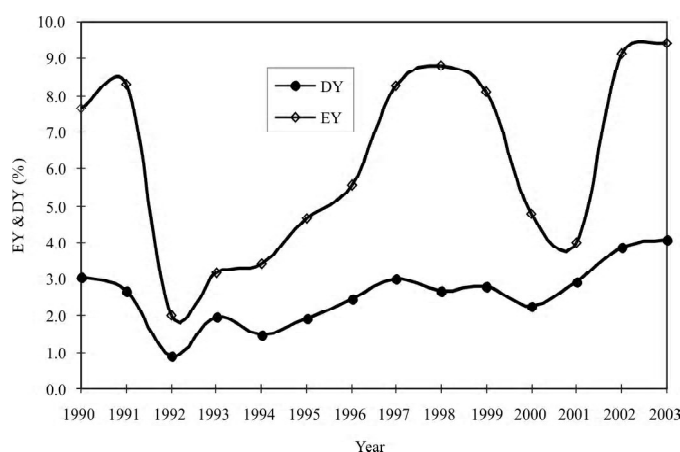


Fig. 10.6 L&T's Earnings and dividend yield

$$DIV_t = a + b_1 EPS_t + b_2 DIV_{t-1} + e_t$$

$$DIV_t = 0.620 + 0.039EPS_t + 0.851 DIV_{t-1}$$

It may be seen from the results that L&T's dividend decision is influenced much more by the past dividend than by current EPS. Assuming that L&T's expected EPS in 2004 is ₹ 20, then, the expected dividend per share will be:

$$DIV_{2004} = 0.620 + 0.039 \times 20 + 0.851 \times 7.5 = \text{Rs } 7.8$$

We may recall that the target payout ratio, $DIV^* = pEPS$. Therefore, the coefficient $b_1 = 0.039 = bp$ (where p is the target payout and b is the speed of adjustment factor) and the coefficient $b_2 = 0.851 = 1 - b$. Thus the value of b (adjustment factor) and p (target payout) is given as follows:

$$bp = 0.039$$

$$1 - b = 0.851$$

$$b = 1 - 0.851 = 0.149$$

$$0.149p = 0.039$$

$$p = 0.039 / 0.149 = 0.26$$

L&T's empirically determined target payout is 26 per cent. However, Its actual average payout during 1990-2003 is 42 per cent.

10.9 SUMMARY

- Dividends may take two forms: cash dividend and bonus shares (stock dividend). In India, bonus shares cannot be issued in lieu of cash dividends. They are paid with cash dividends.
- Bonus shares have a psychological appeal. They do not increase the value of shares.
- Companies generally prefer to pay cash dividends. They finance their expansion and growth by issuing new shares or borrowing. This behaviour is based on the belief that shareholders are entitled to some return on their investment.

NOTES

NOTES

- Most companies have long-term payment ratio targets. But they do not apply target payout ratios to each year's earnings. They try to stabilise dividend payments by moving slowly towards the target payout each year.
- Also, they consider past dividends and current as well as future earnings in determining dividend payment. Investors recognise this. Any extreme changes are read as signals of management's expectations about the company's performance in future. Thus dividends have information contents.
- Companies like to follow a stable dividend policy since investors generally prefer such a policy for the reason of certainty.
- A stable dividend policy does not mean constant dividend per share. It means reasonably predictable dividend policy. Companies determine dividend per share or dividend rate keeping in mind their long-term payout ratio.
- The firm's ability to pay dividend depends on its funds requirements for growth, shareholders' desire and liquidity. A growth firm should set its dividend rate at a low level (because of its high needs for funds) and move towards its target slowly.
- In addition to cash dividends, companies issue bonus shares to shareholders. Bonus shares have no real economic gain; it has psychological value and information content.
- Shareholders expect that the company in the future will improve its performance and it will apply dividend rate to the enhanced capital. In this hope the price may increase. If the actual experience is poor performance and no increase in dividends, share will decline. Share split has the same effect as the bonus shares.

10.10 KEY TERMS

- **Dividend:** A sum of money paid regularly (typically annually) by a company to its shareholders out of its profits (or reserves).
- **Shareholder:** An owner of shares in a company.
- **Widely Held Company:** A widely held company or a publicly listed/ traded company is basically a company that has issued securities/ shares through an initial public offering (IPO) in the primary market, has a mandated statutory basic paid up capital, and is traded on at least one stock exchange or in the over the counter (OTC) market. The shares of the company are widely distributed over millions of shareholders (not restricted to just a handful of shareholders, as in privately held companies) and are traded daily over the stock exchanges.
- **Bonus Shares:** The distribution of shares free of cost to the existing shareholders is known as bonus shares.
- **Share split:** A share split is a method to increase the number of outstanding shares through a proportional reduction in the par value of the share.

10.11 ANSWERS TO 'CHECK YOUR PROGRESS'

1. A firm's net earnings can be divided into two parts: retained earnings and dividends. The firm can use the retained earnings to finance its long term growth. On the other hand, the shareholders also want to have some money in hand, which is

possible only when cash dividend is paid. The shareholders may prefer dividends now, rather than dividends or capital gains at a later date. The management of the firm, while deciding on a dividend policy, has to strike a balance between these two alternatives.

2. In this approach, the firm's requirements are seen as primary. Dividends will be paid only if the firm does not have profitable investment opportunities. Of course fresh equity may be raised to finance new opportunities. However, retained earnings are preferred over fresh equity as floatation costs are not there in the case of retained earnings. This approach also assumes that shareholders prefer wealth maximisation rather than current dividends.
3. Usually these two types of companies follow different dividend policies. Mature companies usually have fewer investment opportunities, and hence often follow high dividend payout ratios. On the other hand, growth companies have plenty of investment opportunities and hence usually follow a low payout ratio.
4. Yes, dividend expectations vary among shareholders. For example, a wealthy shareholder may prefer capital gains rather than current dividends. In contrast, a retired person may prefer a higher quantum of current regular dividends. Institutional investors, who buy shares in bulk and hold them for relatively long periods of time, are not so concerned about personal income taxes but with profitable investments. They prefer a policy of regular cash dividend payments.
5. The firm's decision to pay dividends may be affected by the following two possible view points
 - (a) Firm's need for future funds
 - (b) Shareholder's need for income
6. A stable dividend policy has a number of advantages. First, it accepts that shareholders usually require a certain amount of current income. Second, the investors' uncertainty regarding income is removed. For example, the investor knows that once the dividend rate has been raised, it means that the management is confident of maintaining the raised level of dividend payout for some time. Further, a stable dividend policy usually satisfies the requirement of institutional investors. Raising additional finances also become easier as a stable and regular dividend policy provides positive signals to the market and prospective investors. However, one disadvantage of following a stable dividend policy is that once a dividend payout rate is established, any reduction would send out very negative signals to the market.
7. The greatest danger in adopting a stable dividend policy is that once it is established, it cannot be changed without affecting investor's attitude and the financial standing of the company.
8. Lintner's study found that firms usually consider a dividend policy in terms of proportion of earnings to be paid out. Investment requirements are not considered for modifying the dividend behaviour pattern. Firms therefore generally have target payout ratios in mind while determining change in dividend per share.
9. The most common method of payment to shareholders is distribution of dividends in cash. Another way of rewarding shareholders is to issue bonus shares free of cost to the existing shareholders. The third method is for companies to buy back shares from existing shareholders and thus lower the number of shares issued.

NOTES

NOTES

10. The total net worth of a company is not increased by the issue of bonus shares. It is an accounting transfer from reserves and surplus to paid-up capital. Bonus shares therefore do not increase the economic gain to shareholders; however issuance of bonus shares has psychological value and information content as the indication is that future dividends may increase. As bonus shares are issued to existing shareholders proportionately, there is no dilution of ownership. However, instead of earning dividend, the shareholder has the option of selling the bonus shares in the market and making capital gains. The difference in taxation treatment of dividend and capital gains would decide which is better to shareholders from a taxation point of view. In the case of bonus shares there is no outflow of cash in the case of bonus shares unlike cash dividend payment. Finally, a bonus issue may make the share price more attractive for shareholders.
11. Bonus share is a form of payment of dividend. An issue of bonus shares is the distribution of shares free of cost to the existing shareholders.
12. The usual form of dividend payment are:
 - (a) Cash dividend
 - (b) Bonus Shares
13. A share split is a method to increase the number of outstanding shares through a proportional reduction in the par value of shares of a company. By lowering the par value, the shares become more attractive as the market trading range is lowered. A share split is also often used by the management of the company to indicate to the market that profits of the company will continue to increase in future. Also often it is observed that a company does not reduce the dividend proportionately after a stock split.
14. Some of the main reasons for splitting a firm's shares are:
 - (a) To make trading in shares attractive
 - (b) Indication of higher future profits
 - (c) To give higher dividends to the shareholders

10.12 QUESTIONS AND EXERCISES

Short-Answer Questions

1. Explain the nature of the factors which influence the dividend policy of a firm.
2. What are the factors that influence management's decision to pay dividend of a certain amount?
3. What is a bonus issue or stock dividend? What are its advantages and disadvantages?
4. What are the different payout methods? How do shareholders react to these methods?
5. Explain a stock split? Why is it used? How does it differ from a bonus shares?

Long-Answer Questions

1. 'The primary purpose for which a firm exists is the payment of dividend. Therefore, irrespective of the firm's needs and the desires of shareholders, a firm should follow a policy of very high dividend payout.' Do you agree? Why or why not?

2. What is a stable dividend policy? Why should it be followed? What can be the consequences of changing a stable dividend policy?
3. How is the corporate dividend behaviour determined? Explain Lintner's model in this regard.
4. Bonus shares represent simply a division of corporate pie into a large number of pieces.' Explain.
5. What are the effects of bonus issue and share split on the earnings per share and the market price of the share?

NOTES

10.13 FURTHER READING

Pandey, IM. 2009. *Financial Management*. India: Vikas Publishing Pvt Ltd.

Kuchal. SC. 1999. *Financial Management: An Analytical and Conceptual Approach*. India: Chaitanya Publishing house.

Horne Van, C. James. 2001. *Financial Management and Policy*. New Delhi: Prentice Hall.

Endnotes

1. Rozeff, M.S., "Growth, Beta and Agency Costs as Determinants of Dividends Payout Ratios". *Journal of Financial Research*, 5 (fall 1982), pp. 249–59; Weston, J.F. and Copeland, T.E., *Managerial Finance*, Dryden Press, 1986, p. 659.
2. This is the bird-in-the-hand argument expounded by Gordon, M.J., *The Investment, Financing and Valuation of Corporation*, Richard D. Irwin, 1962.
3. A variety of factors are indicated to influence a firm's dividend policy. See Hastings, P.G., *The Management of Business Finance*, Von Nostrand Co., 1966; Weston, J.F. and Brigham, E.F., *Managerial Finance*, Dryden Press, 1972, pp. 346–49; Brandt, L.K., *Analysis for Financial Management*, Prentice-Hall, 1972; Van Horne, J.C., *Finance Management and Policy*, Prentice-Hall of India, 1976, pp. 287–90.
4. Hasting, *op. cit.*
5. Dividend income in India has been completely exempted from tax while on capital gains, the tax rate is 20 per cent. Thus, the Indian shareholders may prefer dividend over capital gains. The companies, on the other hand, will have to pay tax at 12.5 per cent on the dividends distributed to shareholders. Thus, the effective corporate tax rate would be higher (than 35 per cent) for the dividend distributing companies.
6. Hasting's, *op. cit.*, p. 378.
7. Hasting's, *ibid.*, p. 380.
8. Brandt, *op. cit.*, p. 447.
9. *Ibid.*
10. *Ibid.*, pp. 448–49.
11. Lintner, J., "Distribution of Incomes of Corporations Among Dividends, Retained Earning, and Taxes", *American Economic Review*, 46 (May 1956), pp. 97–133.
12. Bhat, Ramesh and Pandey, I.M., "Dividend Decisions: A Study of Managers' Perception", *Decision*, Vol. 21, Nos. 1&2, January–June 1994.
13. In practice, the target payout may not be known. Hence, Equation (4) can be written as follows:

$$DIV_t = a + b_1 EPS_t + b_2 DIV_{t-1} + e_t$$

where $b_1 = bp$ (adjustment factor multiplied by target payout), and $b_2 = 1 - b$ (one minus adjustment factor).

NOTES

14. Hastings, *op.cit.*, p.370.
15. Gupta, L.C., *Bonus Shares*, Macmillan Co. of India Ltd.
16. For a discussion of pros and cons of bonus shares (stock dividend), see Gupta, *op. cit.*, Porterfield, J.T.S., "Dividends, Dilution and Delusion", *Harvard Business Review*, 37 (Nov.–Dec. 1959), pp. 156–57; Barker, C.A., "Evaluation of Stock Dividends", *Harvard Business Review*, 36 (July–August 1958); Eismann, P.C. and Moser, E.A., "Stock Dividends: Management's View", *Financial Analysis Journal*, (July–Aug. 1978), pp. 77–80.
17. Porterfield, James, T.S., "Dividend, Dilution and Delusion", *Harvard Business Review*, November–December 1959, pp. 156–61.
18. Van Horne, James, C., *Financial Management and Policy*, Prentice-Hall of India, 1971, p. 277.
19. Hausman, W.H., *et. al.*, "Stock Splits, Price Changes and Trading Profit: A Synthesis", *Journal of Business*, 44 (Jan. 1971), pp. 69–77. Also see Barker, C.A., "Effective Stock Splits", *Harvard Business Review*, 34 (Jan.–Feb. 1956) pp. 101–06.
20. West, R.R. and Brouillette, A.B., "Reverse Stock Splits", *Financial Executives*, 38 (Jan. 1970), pp. 12–17.

B. R. Ambedkar Bihar University

(Directorate of Distance Education)

List of Study Centres

1. Directorate of Distance Education, B.R.A. Bihar University, Muzaffarpur
2. Arcade Business College, Rajendra Nagar, Patna
3. B.M.D. College, Dayalpur, Vaishali
4. B.P.S. College, Desari, Vaishali
5. Balmiki Teachers' Training College, Vaishali
6. Chanakya Institute of IT & Management, Near V.K.S. University, Ara
7. Chetan Sadhan Institute & Technology, Juran Chapra, Muzaffarpur
8. Darbhanga National College, Mohalla+PO-Lalbagh, Near (C.M. Science College), Dist- Darbhanga
9. Dr. Jagannath Mishra College, Muzaffarpur
10. Dr. Zakir Hussain Institute, Baily Road, Hartali Mod, Patna
11. Dr. Zakir Hussain Institute, Banka
12. Dr. Zakir Hussain Institute, Bhagalpur
13. Dr. Zakir Hussain Institute, Munger
14. Fundamental College of Education, Bhagalpur
15. Gurukul Institute, Sitamarhi
16. Helping Hand College of Education, Technical Chowk, NayaTola, Muzaffarpur
17. J.P. Institute of Paramedical Science & Higher Edu., Old Motihari Road, Bairia Gola Road, Near Kolhua Chowk, Muzaffarpur
18. Jawahar Lal Nehru Memorial College, Nawahi, Sursand, Sitamarhi
19. Jyoti Institute of Technology, Aghoria Bazar, Muzaffarpur
20. L.N. Mishra College of Business Management, Bhagwanpur, Muzaffarpur
21. L.N.D. College, Motihari
22. Laxman Foundation, Akharaghat Road, Muzaffarpur
23. M.D.D.M. College, Muzaffarpur
24. M.G.C.S.M. College, Kalisthan Road, Begusarai
25. Mahatma Buddha Teachers' Training College, Sitamarhi
26. Muzaffarpur Eye Hospital, Juran Chapra, Road No. 02, Muzaffarpur-842001
27. N.G.M. College, Raxaul
28. Om Sai Nursing Home, Juran Chapra, Muzaffarpur-842001
29. Priya Rani Degree College, Bairstania, Sitamarhi
30. R.N. College, Hajipur, Vaishali
31. R.N. Institute of Health Science, Juran Chapra, Muzaffarpur-842001
32. R.S.S. Science College, Sitamarhi
33. Romaela Institute of Rehabilitation Training & Research, Motihari
34. S.R.A.P. College, Bara Chakia, Motihari
35. Shayam Nandan Sahay College, Dheeranpatti, Muzaffarpur
36. Vaishali Institute of Rural Management, Narayanpur Anant Station Road, Muzaffarpur
37. Zakir Husain Institute, Bela Road, Mithanpura, Muzaffarpur

FINANCIAL MANAGEMENT



**VENKATESHWARA
OPEN UNIVERSITY**
— www.vou.ac.in —