

FINAL COURSE STUDY MATERIAL

PAPER 2

**STRATEGIC FINANCIAL
MANAGEMENT**

MODULE – 1



**BOARD OF STUDIES
THE INSTITUTE OF CHARTERED ACCOUNTANTS OF INDIA**

This Study Material has been prepared by the faculty of the Board of Studies. The objective of the Study Material is to provide teaching material to the students to enable them to obtain knowledge and skills in the subject. In case students need any clarifications or have any suggestions to make for further improvement of the material contained herein, they may write to the Director of Studies.

All care has been taken to provide interpretations and discussions in a manner useful for the students. However, the Study Material has not been specifically discussed by the Council of the Institute or any of its Committees and the views expressed herein may not be taken to necessarily represent the views of the Council or any of its Committees.

Permission of the Institute is essential for reproduction of any portion of this material.

© THE INSTITUTE OF CHARTERED ACCOUNTANTS OF INDIA

All rights reserved. No part of this book may be reproduced, stored in retrieval system, or transmitted, in any form, or by any means, electronic, mechanical, photocopying, recording, or otherwise, without prior permission in writing from the publisher.

Revised Edition : January, 2015

Website : www.icaai.org

Department/
Committee : Board of Studies

E-mail : bosnoida@icaai.in

ISBN No. :

Price :

Published by : The Publication Department on behalf of The Institute of Chartered Accountants of India, ICAI Bhawan, Post Box No. 7100, Indraprastha Marg, New Delhi-110 002, India.

Typeset and designed at Board of Studies.

Printed by :

SYLLABUS

PAPER 2 : STRATEGIC FINANCIAL MANAGEMENT

(One paper – Three hours – 100 marks)

Level of Knowledge: Advanced knowledge

Objective:

To apply financial management theories and techniques for strategic decision making.

Contents:

1. Financial Policy and Corporate Strategy

Strategic decision making framework

Interface of Financial Policy and strategic management

Balancing financial goals vis-à-vis sustainable growth.

2. Project Planning and Capital Budgeting

Feasibility study

Cash flow Projections – Impact of taxation, depreciation, inflation and working capital

Capital Budgeting Decisions - Certainty Equivalent approach, Evaluation of Risky Investment Proposals, Risk and Return analysis, Simulation and decision tree analysis, Sensitivity analysis, Capital Rationing, Adjusted Net Present Value, Replacement decisions, Application of Real Options in capital budgeting, Impact of inflation on capital budgeting decisions

Preparation of Project Report

Social cost benefit analysis.

3. Leasing decision including cross border leasing

4. Dividend Decisions

Dividend theories, Determinants of dividend policies.

5. (a) **Indian Capital Market** including role of various primary and secondary market institutions

(b) **Capital Market Instruments**

Financial derivatives – stock futures, stock options, index futures, index options

Option valuation techniques : Binomial model, Black Scholes Option Pricing Model, Greeks – Delta, Gamma, Theta, Rho and Vega

Pricing of Futures – Cost of carry model

Imbedded derivatives

(c) Commodity derivatives

(d) OTC derivatives -Swaps, Swaptions, Forward Rate Agreements (FRAs), Caps, Floors and Collors.

6. Security Analysis

Fundamental analysis - Economic analysis, Industry analysis and Company Analysis

Bond valuation, Price Yield relationship, Bond Price forecasting – application of duration and convexity, Yield curve strategies

Technical Analysis – market cycle model and basic trend identification, different types of charting, support and resistance, price patterns, moving averages, Bollinger Bands, momentum analysis.

7. Portfolio Theory and Asset Pricing

Efficient Market Theory – Random walk theory; Markowitz model of risk return optimization

Capital Asset Pricing Model (CAPM)

Arbitrage Pricing Theory (APT)

Sharpe Index Model

Portfolio Management - Formulation, Monitoring and Evaluation

Equity Style Management

Principles and Management of Hedge Funds

International Portfolio Management.

8. Financial Services in India

Investment Banking

Retail Banking

On Line Share Trading

Depository Service.

9. (a) Mutual Funds: Regulatory framework, formulation, monitoring and evaluation of various schemes of Mutual funds, Money market mutual funds.

(b) Exchange Traded Funds.

10. Money Market operations

11. (a) Foreign Direct Investment, Foreign Institutional Investment.

(b) International Financial Management

Raising of capital abroad - American Depository Receipts, Global Depository Receipts, External Commercial Borrowings and Foreign Currency Convertible Bonds

International Capital Budgeting

International Working Capital Management.

12. Foreign Exchange Exposure and Risk Management

Exchange rate determination, Exchange rate forecasting

Foreign currency market

Foreign exchange derivatives – Forward, futures, options and swaps

Management of transaction, translation and economic exposures

Hedging currency risk.

13. Mergers, Acquisitions and Restructuring

Meaning of mergers and acquisition, categories, purposes

Process of mergers and acquisition – Identification and valuation of the target, acquisition through negotiation, due diligence, post – merger integration

Legal and regulatory requirements

Merger and Acquisition agreement

Reverse merger

Potential adverse competitive effects of mergers

Corporate Takeovers: Motivations, Co-insurance effect, Cross-border takeovers, Forms of takeovers, Takeover defenses

Going Private and Other Control Transactions: Leveraged Buyouts (LBOs), Management Buyouts (MBOs), Spin Offs and Asset Divestitures

Corporate Restructuring : Refinancing and rescue financing, reorganizations of debtors and creditors, Sale of assets, targeted stock offerings, downsizing and layoff programmes, negotiated wage give-backs, employee buyouts.

A WORD ABOUT STUDY MATERIAL

Strategic Financial Management (SFM) is a blend of Strategic Management and Financial Management. It has acquired a critical significance now-a-days, due to recent surge in globalization and massive cross border flow of capital. The study of this subject opens new opportunities for Chartered Accountancy students. The paper stresses the importance of applying the knowledge and techniques of financial management to the planning, operating and monitoring of the finance function in particular as well as the organization in general.

Further, this paper not only focuses on these aspects at the domestic level but also at the international level as well.

This study material provides the concepts, theories and techniques relating to Strategic Financial Management and aims to develop the students' ability in understanding the different concepts and their application in the real life situations.

The study material is divided into thirteen chapters. Further these chapters have been divided into three Modules. Latest developments in the field of finance including international finance have been incorporated in almost all the chapters. The study material also focuses on the decision making in an international context and it provides comprehensive coverage of important areas like foreign exchange market, derivatives, foreign exchange exposure, risk analysis and management, raising of capital abroad, mergers and acquisitions and portfolio management, capital budgeting and working capital management in a multinational context. Chapters have been organised in such a way so as to provide a logical sequence to facilitate easy understanding. A helpful feature in this study material is the addition of a number of illustrations in each chapter to help students to have a better grasp of the subject. For a quick grasp of the subject during examination days a summary has also been inserted in the end of each chapter. Numerous graphs and figures have also been added to make things more appealing. Some of the chapters also contain Glossary of terms used. **This study material should be studied in combination of Practice Manual of SFM to practice more practical questions for better understanding of the subject.**

They need to practice the practical problems thoroughly. Students are also advised to update themselves with the latest changes in the financial sector. For this they may refer to academic updates in the monthly journal 'The Chartered Accountant' and the Students 'Newsletter'

published by the Board of Studies, financial newspapers, SEBI and Corporate Law Journal etc.

In case you need any further clarification/guidance, please send your queries at email-id: ashish.gupta@icai.in or write to the Director of Studies, The Institute of Chartered Accountants of India, A-29, Sector-62, Noida-201 309.

Happy Reading and Best Wishes!

SIGNIFICANT ADDITIONS/AMENDMENTS IN THIS EDITION

In this 2015 Edition, following additions have been made:

- (a) Chapter 2 – Insertion of material on Capital Rationing.
- (b) Chapter 5 – Thoroughly reviewed.
- (c) Chapter 10 – Thoroughly reviewed.
- (d) Chapter 11 – Thoroughly reviewed.
- (e) Chapter 12 – A note on Nostro and Vostro along with an illustration has been incorporated.
- (f) Chapter 13 – In addition to deletion of superfluous material, earlier Case Studies has been revised.
- (g) Remaining Chapters – Minor corrections have been carried out to improve presentation and accuracy.

CONTENTS

MODULE-1

Chapter 1 – Financial Policy and Corporate Strategy

Chapter 2 – Project Planning and Capital Budgeting

Chapter 3 – Leasing Decisions

Chapter 4 – Dividend Decisions

MODULE-2

Chapter 5 – Indian Capital Market

Chapter 6 – Security Analysis

Chapter 7 - Portfolio Theory

Chapter 8 – Financial Services In India

Chapter 9 – Mutual Funds

Chapter 10 – Money Market Operations

MODULE-3

Chapter 11 – Foreign Direct Investment (FDI), Foreign Institutional Investment (FIIS) and International Financial Management

Chapter 12 – Foreign Exchange Exposure and Risk Management

Chapter 13 – Mergers, Acquisitions & Restructuring

DETAILED CONTENTS: MODULE – 1

CHAPTER 1 – FINANCIAL POLICY AND CORPORATE STRATEGY

1.	Strategic Financial Decision Making Frame Work.....	1.1
2.	Strategy at Different Hierarchy Levels.....	1.3
3.	Financial Planning.....	1.4
4.	Interface of Financial Policy and Strategic Management	1.5
5.	Balancing Financial Goals vis-à-vis Sustainable Growth	1.6

CHAPTER 2 – PROJECT PLANNING AND CAPITAL BUDGETING

1.	Feasibility Study.....	2.2
2.	Contents of a Project Report	2.14
3.	Social Cost Benefit Analysis.....	2.19
4.	Capital Budgeting under Risk and Uncertainty	2.21
5.	Capital Budgeting under Capital Rationing	2.41
6.	Capital Budgeting under Inflation	2.45
7.	Capital Asset Pricing Model Approach to Capital Budgeting.....	2.50
8.	Replacement Decision	2.53
9.	Real Option in Capital Budgeting	2.56

CHAPTER 3 – LEASING DECISIONS

1.	Leasing	3.1
2.	Types of Leasing	3.2
3.	Advantages of Leasing.....	3.3
4.	Disadvantages of Leasing.....	3.4
5.	Financial Evaluation	3.4
6.	Break Even Lease Rental (BELR)	3.17
7.	Cross Border Leasing	3.20

CHAPTER 4 – DIVIDEND DECISIONS

1.	Introduction.....	4.1
2.	Dividend Policy	4.1
3.	Practical considerations in Dividend Policy	4.2
4.	Theories on Dividend Policies	4.7

Financial Policy and Corporate Strategy

Learning Objectives

After reading this chapter student shall be able to understand:

- Strategic Financial Decision Making Frame Work
- Strategy at different hierarchy levels
- Financial Planning
- Interface of Financial Policy and Strategic Management
- Balancing Financial Goals vis-à-vis Sustainable Growth

1. Strategic Financial Decision Making Frame Work

Capital investment is the springboard for wealth creation. In a world of economic uncertainty, the investors want to maximize their wealth by selecting optimum investment and financial opportunities that will give them maximum expected returns at minimum risk. Since management is ultimately responsible to the investors, the objective of corporate financial management should implement investment and financing decisions which should satisfy the shareholders by placing them all in an equal, optimum financial position. The satisfaction of the interests of the shareholders should be perceived as a means to an end, namely maximization of shareholders' wealth. Since capital is the limiting factor, the problem that the management will face is the strategic allocation of limited funds between alternative uses in such a manner, that the companies have the ability to sustain or increase investor returns through a continual search for investment opportunities that generate funds for their business and are more favourable for the investors. Therefore, all businesses need to have the following three fundamental essential elements:

- A clear and realistic **strategy**,
- The **financial** resources, controls and systems to see it through and
- The right **management** team and processes to make it happen.

We may summarise this by saying that:

Strategy + Finance + Management = Fundamentals of Business

Strategy may be defined as the long term direction and scope of an organization to achieve competitive advantage through the configuration of resources within a changing environment for the fulfilment of stakeholder's aspirations and expectations. In an idealized world, management is ultimately responsible to the investors. Investors maximize their wealth by

1.2 Strategic Financial Management

selecting optimum investment and financing opportunities, using financial models that maximize expected returns in absolute terms at minimum risk. What concerns the investors is not simply maximum profit but also the likelihood of it arising: a risk-return trade-off from a portfolio of investments, with which they feel comfortable and which may be unique for each individual.

We call this overall approach strategic financial management and define it as being the application to strategic decisions of financial techniques in order to help achieve the decision-maker's objectives. Although linked with accounting, the focus of strategic financial management is different. *Strategic financial management combines the backward-looking, report-focused discipline of (financial) accounting with the more dynamic, forward-looking subject of financial management.* It is basically about the identification of the possible strategies capable of maximizing an organization's market value. It involves the allocation of scarce capital resources among competing opportunities. It also encompasses the implementation and monitoring of the chosen strategy so as to achieve agreed objectives.

1.1 Functions of Strategic Financial Management: Strategic Financial Management is the portfolio constituent of the corporate strategic plan that embraces the optimum investment and financing decisions required to attain the overall specified objectives. In this connection, it is necessary to distinguish between strategic, tactical and operational financial planning. While strategy is a long-term course of action, tactics are intermediate plan, while operations are short-term functions. Senior management decides strategy, middle level decides tactics and operational are looked after line management.

Irrespective of the time horizon, the investment and financial decisions functions involve the following functions¹:

- * Continual search for best investment opportunities;
- * Selection of the best profitable opportunities;
- * Determination of optimal mix of funds for the opportunities;
- * Establishment of systems for internal controls; and
- * Analysis of results for future decision-making.

Since capital is the limiting factor, the strategic problem for financial management is how limited funds are allocated between alternative uses. This dilemma of corporate management is resolved by the pioneering work of Jensen and Meckling (1976)², which is popularly known as 'agency theory' which you have already studied at your Intermediate (IPC) level. According to this theory, strategic financial management is the function of four major components based on the mathematical concept of expected NPV (net present value) maximization,- Financing decisions; Investment decisions; Dividend decisions; and Portfolio decisions.

The key decisions falling within the scope of financial strategy include the following:

¹ Strategic Financial Management: Exercises, Robert Alan Hill.

² Jensen, M.C. & W.C. Meckling (1976), "Theory of the Firm: Managerial Behaviour, Agency Costs and Ownership Structure", Journal of Financial Economics, October, V.3,4, pp. 305-360

1. **Financing decisions:** These decisions deal with the mode of financing or mix of equity capital and debt capital.
2. **Investment decisions:** These decisions involve the profitable utilization of firm's funds especially in long-term projects (capital projects). Since the future benefits associated with such projects are not known with certainty, investment decisions necessarily involve risk. The projects are therefore evaluated in relation to their expected return and risk.
3. **Dividend decisions:** These decisions determine the division of earnings between payments to shareholders and reinvestment in the company.
4. **Portfolio decisions:** These decisions involve evaluation of investments based on their contribution to the aggregate performance of the entire corporation rather than on the isolated characteristics of the investments themselves. You have already, learnt about the Financing and Investment decisions in your Intermediate (IPC) curriculum, while Dividend and Portfolio decisions would be taken in detail later in this Study Material.

2. Strategy at Different Hierarchy Levels

Strategies at different levels are the outcomes of different planning needs. There are three levels of Strategy – Corporate level; Business unit level; and Functional or departmental level.

2.1 Corporate Level Strategy: Corporate level strategy fundamentally is concerned with selection of businesses in which a company should compete and also with the development and coordination of that portfolio of businesses.

Corporate level strategy should be able to answer three basic questions:	
<i>Suitability</i>	Whether the strategy would work for the accomplishment of common objective of the company.
<i>Feasibility</i>	Determines the kind and number of resources required to formulate and implement the strategy.
<i>Acceptability</i>	It is concerned with the stakeholders' satisfaction and can be financial and non-financial.

2.2 Business Unit Level Strategy: Strategic business unit (SBU) may be any profit centre that can be planned independently from the other business units of a corporation. At the business unit level, the strategic issues are about practical coordination of operating units and developing and sustaining a competitive advantage for the products and services that are produced.

2.3 Functional Level Strategy: The functional level is the level of the operating divisions and departments. The strategic issues at this level are related to functional business processes and value chain. Functional level strategies in R&D, operations, manufacturing, marketing, finance, and human resources involve the development and coordination of resources through which business unit level strategies can be executed effectively and efficiently. Functional units of an organization are involved in higher level strategies by providing input to the business unit level and corporate level strategy, such as providing

1.4 Strategic Financial Management

information on customer feedback or on resources and capabilities on which the higher level strategies can be based. Once the higher level strategy is developed, the functional units translate them into discrete action plans that each department or division must accomplish for the strategy to succeed.

Among the different functional activities viz production, marketing, finance, human resources and research and development, finance assumes highest importance during the top down and bottom up interaction of planning. Corporate strategy deals with deployment of resources and financial strategy is mainly concerned with mobilization and effective utilization of money, the most critical resource that a business firm likes to have under its command. Truly speaking, other resources can be easily mobilized if the firm has adequate monetary base. To go into the details of this interface between financial strategy and corporate strategy and financial planning and corporate planning let us examine the basic issues addressed under financial planning.

3. Financial Planning

Financial planning is the backbone of the business planning and corporate planning. It helps in defining the feasible area of operation for all types of activities and thereby defines the overall planning framework. Financial planning is a systematic approach whereby the financial planner helps the customer to maximize his existing financial resources by utilizing financial tools to achieve his financial goals.

There are 3 major components of Financial planning:

- Financial Resources (FR)
- Financial Tools (FT)
- Financial Goals (FG)

Financial Planning: $FR + FT = FG$
--

For an individual, financial planning is the process of meeting one's life goals through proper management of the finances. These goals may include buying a house, saving for children's education or planning for retirement. It is a process that consists of specific steps that helps in taking a big-picture look at where you financially are. Using these steps you can work out where you are now, what you may need in the future and what you must do to reach your goals.

Outcomes of the financial planning are the financial objectives, financial decision-making and financial measures for the evaluation of the corporate performance. Financial objectives are to be decided at the very outset so that rest of the decisions can be taken accordingly. The objectives need to be consistent with the corporate mission and corporate objectives. Financial decision making helps in analyzing the financial problems that are being faced by the corporate and accordingly deciding the course of action to be taken by it. The financial measures like ratio analysis, analysis of cash flow statement are used to evaluate the performance of the Company. The selection of these measures again depends upon the Corporate objectives.

4. Interface of Financial Policy and Strategic Management

The interface of strategic management and financial policy will be clearly understood if we appreciate the fact that the starting point of an organization is money and the end point of that organization is also money. No organization can run an existing business and promote a new expansion project without a suitable internally mobilized financial base or both i.e. internally and externally mobilized financial base.

Sources of finance and capital structure are the most important dimensions of a strategic plan. The need for fund mobilization to support the expansion activity of firm is very vital for any organization. The generation of funds may arise out of ownership capital and or borrowed capital. A company may issue equity shares and/or preference shares for mobilizing ownership capital and debentures to raise borrowed capital. Public deposits, for a fixed time period, have also become a major source of short and medium term finance. Organizations may offer higher rates of interest than banking institutions to attract investors and raise fund. The overdraft, cash credits, bill discounting, bank loan and trade credit are the other sources of short term finance.

Along with the mobilization of funds, policy makers should decide on the capital structure to indicate the desired mix of equity capital and debt capital. There are some norms for debt equity ratio. Which need to be followed for minimizing the risks of excessive loans. For instance, public sector organizations, the norm is 1:1 ratio and for private sector firms, the norm is 2:1 ratio. However this ratio in its ideal form varies from industry to industry. It also depends on the planning mode of the organization. For capital intensive industries, the proportion of debt to equity is much higher. Similar is the case for high cost projects in priority sectors and for projects in under developed regions.

Another important dimension of strategic management and financial policy interface is the investment and fund allocation decisions. A planner has to frame policies for regulating investments in fixed assets and for restraining of current assets. Investment proposals mooted by different business units may be divided into three groups. One type of proposal will be for addition of a new product by the firm. Another type of proposal will be to increase the level of operation of an existing product through either an increase in capacity in the existing plant or setting up of another plant for meeting additional capacity requirement. The last is for cost reduction and efficient utilization of resources through a new approach and or closer monitoring of the different critical activities. Now, given these three types of proposals a planner should evaluate each one of them by making within group comparison in the light of capital budgeting exercise. In fact project evaluation and project selection are the two most important jobs under fund allocation. Planner's task is to make the best possible allocation under resource constraints.

Dividend policy is yet another area for making financial policy decisions affecting the strategic performance of the company. A close interface is needed to frame the policy to be beneficial for all. Dividend policy decision deals with the extent of earnings to be distributed as dividend and the extent of earnings to be retained for future expansion scheme of the firm. From the point of view of long term funding of business growth, dividend can be considered as that part of total earnings, which cannot be profitably utilized by the company. Stability of the dividend

1.6 Strategic Financial Management

payment is a desirable consideration that can have a positive impact on share prices. The alternative policy of paying a constant percentage of the net earnings may be preferable from the point of view of both flexibility of the firm and ability of the firm. It also gives a message of lesser risk for the investors. Yet some other companies follow a different alternative. They pay a minimum dividend per share and additional dividend when earnings are higher than the normal earnings. In actual practice, investment opportunities and financial needs of the firm and the shareholders preference for dividend against capital gains resulting out of share are to be taken into consideration for arriving at the right dividend policy. Alternatives like cash dividend and stock dividend are also to be examined while working out an ideal dividend policy that supports and promotes the corporate strategy of the company.

Thus, the financial policy of a company cannot be worked out in isolation of other functional policies. It has a wider appeal and closer link with the overall organizational performance and direction of growth. These policies being related to external awareness about the firm, especially the awareness of the investors about the firm, in respect of its internal performance. There is always a process of evaluation active in the minds of the current and future stake holders of the company. As a result preference and patronage for the company depends significantly on the financial policy framework. Hence, attention of the corporate planners must be drawn while framing the financial policies not at a later stage but during the stage of corporate planning itself. The nature of interdependence is the crucial factor to be studied and modelled by using an in depth analytical approach. This is a very difficult task compared to usual cause and effect study because corporate strategy is the cause and financial policy is the effect and sometimes financial policy is the cause and corporate strategy is the effect.

5. Balancing Financial Goals Vis-a-Vis Sustainable Growth

The concept of sustainable growth can be helpful for planning healthy corporate growth. This concept forces managers to consider the financial consequences of sales increases and to set sales growth goals that are consistent with the operating and financial policies of the firm. Often, a conflict can arise if growth objectives are not consistent with the value of the organization's sustainable growth. Question concerning right distribution of resources may take a difficult shape if we take into consideration the rightness not for the current stakeholders but for the future stakeholders also. To take an illustration, let us refer to fuel industry where resources are limited in quantity and a judicious use of resources is needed to cater to the need of the future customers along with the need of the present customers. One may have noticed the save fuel campaign, a demarketing campaign that deviates from the usual approach of sales growth strategy and preaches for conservation of fuel for their use across generation. This is an example of stable growth strategy adopted by the oil industry as a whole under resource constraints and the long run objective of survival over years. Incremental growth strategy, profit strategy and pause strategy are other variants of stable growth strategy.

Sustainable growth is important to enterprise long-term development. Too fast or too slow growth will go against enterprise growth and development, so financial should play important role in enterprise development, adopt suitable financial policy initiative to make sure enterprise growth speed close to sustainable growth ratio and have sustainable healthy development.

What makes an organisation financially sustainable?

To be financially sustainable, an organisation must:

- have more than one source of income;
- have more than one way of generating income;
- do strategic, action and financial planning regularly;
- have adequate financial systems;
- have a good public image;
- be clear about its values (value clarity); and
- have financial autonomy.

Source: CIVICUS "Developing a Financing Strategy".

The sustainable growth rate (SGR), concept by Robert C. Higgins, of a firm is the maximum rate of growth in sales that can be achieved, given the firm's profitability, asset utilization, and desired dividend payout and debt (financial leverage) ratios. The sustainable growth rate is a measure of how much a firm can grow without borrowing more money. After the firm has passed this rate, it must borrow funds from another source to facilitate growth. Variables typically include the net profit margin on new and existing revenues; the asset turnover ratio, which is the ratio of sales revenues to total assets; the assets to beginning of period equity ratio; and the retention rate, which is defined as the fraction of earnings retained in the business.

$$\text{SGR} = \text{ROE} \times (1 - \text{Dividend payment ratio})$$

Sustainable growth models assume that the business wants to: 1) maintain a target capital structure without issuing new equity; 2) maintain a target dividend payment ratio; and 3) increase sales as rapidly as market conditions allow. Since the asset to beginning of period equity ratio is constant and the firm's only source of new equity is retained earnings, sales and assets cannot grow any faster than the retained earnings plus the additional debt that the retained earnings can support. The sustainable growth rate is consistent with the observed evidence that most corporations are reluctant to issue new equity. If, however, the firm is willing to issue additional equity, there is in principle no financial constraint on its growth rate. Indeed, the sustainable growth rate formula is directly predicted on return on equity.

Economists and business researchers contend that achieving sustainable growth is not possible without paying heed to twin cornerstones: growth strategy and growth capability. Companies that pay inadequate attention to one aspect or the other are doomed to failure in their efforts to establish practices of sustainable growth (though short-term gains may be realized). After all, if a company has an excellent growth strategy in place, but has not put the necessary infrastructure in place to execute that strategy, long-term growth is impossible. The reverse is true as well.

1.8 Strategic Financial Management

The very weak idea of sustainability requires that the overall stock of capital assets should remain constant. The weak version of sustainability refers to preservation of critical resources to ensure support for all, over a long time horizon. The strong concept of sustainability is concerned with the preservation of resources under the primacy of ecosystem functioning. These are in line with the definition provided by the economists in the context of sustainable development at macro level.

What makes an organisation sustainable?

- In order to be sustainable, an organisation must:
- have a clear strategic direction;
- be able to scan its environment or context to identify opportunities for its work;
- be able to attract, manage and retain competent staff;
- have an adequate administrative and financial infrastructure;
- be able to demonstrate its effectiveness and impact in order to leverage further resources; and
- get community support for, and involvement in its work.

Source: CIVICUS "Developing a Financing Strategy".

The sustainable growth model is particularly helpful in situations in which a borrower requests additional financing. The need for additional loans creates a potentially risky situation of too much debt and too little equity. Either additional equity must be raised or the borrower will have to reduce the rate of expansion to a level that can be sustained without an increase in financial leverage.

Mature firms often have actual growth rates that are less than the sustainable growth rate. In these cases, management's principal objective is finding productive uses for the cash flows that exist in excess of their needs. Options available to business owners and executives in such cases includes returning the money to shareholders through increased dividends or common stock repurchases, reducing the firm's debt load, or increasing possession of lower earning liquid assets. These actions serve to decrease the sustainable growth rate. Alternatively, these firms can attempt to enhance their actual growth rates through the acquisition of rapidly growing companies.

Growth can come from two sources: increased volume and inflation. The inflationary increase in assets must be financed as though it were real growth. Inflation increases the amount of external financing required and increases the debt-to-equity ratio when this ratio is measured on a historical cost basis. Thus, if creditors require that a firm's historical cost debt-to-equity ratio stay constant, inflation lowers the firm's sustainable growth rate.

Mitsubishi Corporation (MC): New Strategic Direction (charting a new path toward sustainable growth)

Mitsubishi Corporation has abolished its traditional "*midterm management plan*" concept of committing to fixed financial targets three years in the future, in favour of a long-term, circa 2020 growth vision. The "*New Strategic Direction*" consists of basic concepts on management policy together with business and market strategies. It seeks to recognize the Company's value and upside potential as a *sogo shosha* capable of "*providing stable earnings throughout business cycles by managing a portfolio diversified by business model, industry, market and geography*".

MC remains dedicated to sustainable growth but as evidenced by its guiding philosophy, the "Three Corporate Principles", its business activities are even more committed to helping solve problems in Japan and around the world. Its chief goal is to contribute to sustainable societal growth on a global scale.

The summary of this New Strategic Direction is:

- Future pull approach eyeing 2020 with a vision to double the business by building a diversified but focussed portfolio.
- Clear portfolio strategy: Select winning businesses through proactive reshaping of portfolio.
- Grow business and deliver returns while maintaining financial discipline.

2

Project Planning and Capital Budgeting

Learning Objectives

After going through the chapter student shall be able to understand:

- Study of feasibility of any investment under the following heads:
 - (a) Market Feasibility
 - (b) Technical Feasibility
 - (c) Financial Feasibility
- A brief study of the various aspects of Project Report including its specimen and Post Completion Audit
- Social Cost Benefit Analysis- Features, Techniques, Limitations etc.
- Capital Budgeting under Risk and Uncertainty
 - (1) Risk Adjusted Discount Rate Method
 - (2) Certainty Equivalent Approach (CE Approach)
 - (3) Other Methods
 - (a) Sensitivity Analysis
 - (b) Scenario Analysis
 - (c) Simulation Analysis (Monte Carlo)
 - (d) Decision Tree Analysis
- Capital Budgeting under Capital Rationing
- Capital Budgeting under Inflation
- Capital Asset Pricing Model Approach to Capital Budgeting
- Replacement Decision
- Real Option in Capital Budgeting - Valuation and Types

1. Feasibility Study

Project feasibility is a test by which an investment is evaluated. There are three types of feasibilities evaluated for a project viz.

- 1) market feasibility
- 2) technical feasibility and
- 3) financial feasibility.

For projects evaluated by government, economic and social feasibility is also considered.

1.1. Market Feasibility: Products having high sales potential are less risky to invest in. For conducting market feasibility study, the type of proposed product is important. Indicators of buyer behavior in response to a new product have to be taken into account for estimating the potential demand. A proposed product, if new in a country, but successfully marketed in other countries, then its market feasibility is assessed through comparison of some broad economic and cultural indicators in both the countries. Each country will experience an identical buying pattern and preference for products, if the economic indicators are comparable. Cultural differences should be adjusted so as to draw conclusions about the demand, per-capita incomes, income disparity levels, pattern indicating shifts in consumption, literacy level and other economic factors indicating the potential demand for a particular product.

A proposed project for an addition to the existing capacity, the task of market feasibility study shall be different. Historical data analysis and study of factors influencing consumption trends become essential. The market feasibility study for a product already selling in the market consists of:

- (a) Economic Indicators – A change in demand and a change in one or some economic indicators may take place simultaneously.
- (b) Demand Estimation – Projection of demand is most important step in project feasibility study. These include:
 - End-user profile
 - Study of influencing factors
 - Regional, national and export market potential
 - Infra-structure facilities facilitating or continuing demand
 - Demand forecasting
- (c) End-user profile – A product may have different uses and end-users. Total demand is made up of different end-users. Different market segments may not be interlinked. Demand for cement is divided into two categories, housing/ maintenance and infrastructure viz. irrigation, canal, railways, road and ports. The end-users are also classified into government and non-government demand, urban and rural demand.

2.3 Strategic Financial Management

- (d) Influencing Factors – Demand for a product is a derived demand. Demand for fertilizer sales is dependent on monsoons while sale of steel and industrial growth are associated with each other.
- (e) Market Potential – Regional, national and export market potential of a product may be different. Study of national demand may not be adequate due to regional imbalances caused by several constraints. Assessment of export potential is another important exercise. Economic distance to which a product can be exported must be evaluated. Importing countries must be identified, and countries that have no exportable surplus. Cost and quality aspects of goods must be compared with other potentially exporting countries. International relations, import and export barriers in countries, and other factors need to be understood.
- (f) Infrastructure Facility – It needs to be assessed properly. Exportability depends more on high cost of transportation.
- (g) Demand Forecasting – It is an important step in the assessment of demand potential. Growth in demand in past can be indicative of future demand. There are various methods of demand forecasting. Some factors influencing consumption behaviour in the past will continue to influence the future, others provide for adjustment of some economic indicators likely to be different in the future.
- (h) Supply Estimation – Past trends of supply of goods can be studied and further extrapolated. Projections so made need to be adjusted with additional information, projects undertaken in the economy, import possibility as governed by import policy, import tariff and international prices. Information regarding entry barrier is necessary. A long gestation period and a high capital to labour ratio may create a natural entry barrier. Government licensing policy, availability of required input like materials and skilled labour also cause entry on barrier. A product whose entry barrier is high is unlikely to find a sudden spur in supply, offering more comfortable position to existing players.
- (i) Identification of Critical Success Factors – For choice of location and to find the risk of a project, it is necessary to identify critical factors, which determine the success of project. Availability of raw material supply and cost of power, transportation facilities, supply of skilled manpower or other variables could be the critical success factors. They are product and region specific. The right choice of location may reduce the cost of a project and the uncertainty regarding the availability of resources. If some crucial factors are subject to volatile changes, then the impact of their variability on the net profitability of a project has to be separately evaluated.
- (j) Estimation of the Demand-Supply Gap – Demand and supply estimates have to be fine-tuned with new or changed factors and then compared with each other for determining the gap. The demand-supply gap is fruitful for a geographical territory. The forecast of demand and supply may not be a single point forecast. A multiple point forecast gives the most adverse, most likely and most favourable forecast of demand and supply.

To find Demand Supply Gap,

Demand Surplus : Minimum = Min demand – Max supply

Likely = Likely demand – Likely supply

Maximum = Max demand – Likely supply.

1.2 Technical Feasibility: The technical feasibility analysis of a project can vary with the size and complexity involved in setting up the project. Establishing a large scale project for manufacturing of a product (e.g., automobile, chemicals, steel or cement) will require an analyst to evaluate many of the points listed below:-

- (1) Plant location and site access
 - a. by road,
 - b. by rail and
 - c. by Telecom
- (2) Issues related to 'Seismic zone'
- (3) Soil structure analysis
- (4) Program for preparation of construction site
- (5) Civil engineering and construction capabilities i.e. piling, roads, ports, pipelines, transmission, etc.
- (6) Receipt of equipment
- (7) Facilities for erection and/or assembly of machinery
- (8) Raw material availability
 - a. Quality
 - b. Quantity
- (9) Component availability – vendor capabilities
- (10) Utilities availability
 - a. Power (back-up)
 - b. Water (quality and quantity)
 - c. Sanitation and sewerage services
- (11) Proposed technology versus available alternative technologies
- (12) Whether the chosen technology is already in operation, if yes, where?
- (13) Ease of technology absorption; learning curve analysis
- (14) Details of Technical collaboration, if any. If yes, details of collaborator
- (15) Technical Collaboration agreement review
- (16) Support from collaborators – Supply vs. Supply, installation and commissioning?
- (17) The technical specifications of plant and equipments
- (18) Plant design and layout

2.5 Strategic Financial Management

- (19) Product mix and implications on capacity utilisation
- (20) Scale of operations and line balancing
- (21) Production bottlenecks
- (22) Flexibility in production lines
- (23) Effluents and disposal of effluents
- (24) Selection process for supply of Plant and equipments
- (25) Support from Plant & Equipment suppliers in case of downtime
 - a. availability of Service Level Agreements (SLAs)
 - b. availability and cost of machinery spare parts
- (26) Localization programme (PMP – Phased Manufacturing Program)
- (27) By-products, use and disposal
- (28) Present installed capacity, future capacity build-up – possibilities and constraints
- (29) Type of buildings (Class 1, 2 or 3) and appropriateness of the buildings
- (30) Availability of right labour for the technology selected – Adequacy of training/skilling of manpower by collaborators at their workplace
- (31) Lead times for delivery of Plant and equipments
- (32) Back to back liability (Liquidate Damages (LD)) clauses with suppliers of equipments
- (33) Availability of Patent licences to use certain external processes
- (34) Sewing the insurance load factors into plant layout
- (35) Research & development – inputs and capability
- (36) Process losses and possibilities to arrest the losses
- (37) Possibilities for future manufacturing/operating cost reduction
- (38) Project monitoring systems are in place?
- (39) Technical obsolescence possibilities
- (40) Safety standards, workplace hazards
- (41) Evacuation in case of disaster
- (42) Disaster recovery possibilities and back-up options
- (43) Technical Drawings, Blueprints

The commercial side of technical details has to be studied along with the technical aspects so that commercial viability of the technology can be evaluated.

1.3 Financial Feasibility: Demand and price estimates are determined from the market feasibility study. Project costs along with operating costs are derived from technical feasibility study. The estimates have to be made from (a) tax implications of the prevailing tax laws, (b)

financial costs involved from financing alternatives for the project. Financial feasibility study requires detailed financial analysis based on certain assumptions, workings and calculations such as:

- (1) Projections for prices of products, cost of various resources for manufacturing goods, capacity utilization. The actual data of comparable projects are included in the estimates.
- (2) Period of estimation is determined on the basis of product life cycle, business cycle; period of debt funds etc. and the value of the project at the terminal period of estimation are forecasted.
- (3) Financing alternatives are considered and a choice of financing mix made with regard to cost of funds and repayment schedules.
- (4) Basic workings in different schedules like Interest and repayment schedule, working capital schedule, working capital loan, interest and repayment schedule, depreciation schedule for income tax purposes, depreciation schedule for the purpose of reporting under Companies Act, 1956 (if policy is different from income tax rules).
- (5) Financial statements prepared in the project feasibility report viz. profit and loss account, balance sheet and cash flow statements for the proposed project.
- (6) Financial indicators calculated from data available in various financial statements. Basic financial parameters used for judging the viability of the project are Interest Coverage Ratio, Debt-Service Coverage Ratio (DSCR), Net Present Value (NPV) or internal rate of return (IRR). Some firms use payback period interest coverage ratio, net present value (NPV), as alternate additional tools.
- (7) When a project is set up with debt, especially with loans from Banks and Financial Institutions, it is necessary to take into account the specific requirements of such Institutions.

1.3.1 Risk Assessment: Basic indicators of financial viability use profit and cash flow estimates subject to risk or uncertainty. Evaluation of risk is necessary through the adoption of various analysis.

1.3.2 Financial Projections: In assessing the financial viability of a project it is necessary to look at the forecasts of financial condition and flows viz.

- Projected Balance Sheet
- Projected Cash Flow Statement

1.3.2.1 Projected Balance Sheet: The balance sheet, showing the balance in various asset and liability accounts, reflects the financial condition of the firm at a given point of time.

Format of Balance Sheet

Liabilities	Assets
Share capital	Fixed assets
Reserves and surplus	Investments
Secured loans	Current assets, loans and advances

2.7 Strategic Financial Management

Unsecured loans	Miscellaneous expenditure and losses
Current liabilities and Provisions	

Liabilities side of the balance sheet shows the sources of finance employed by the business. Assets side of the balance sheet shows how funds have been used in the business.

For preparing the projected balance sheet at the end of year n+1, information about the following is required:

- Balance Sheet at the end of year n
- Projected Income statement and the distribution of earnings for year n+1
- Sources of external financing proposed to be tapped in year n+1
- Expected changes in current liabilities in year n+1
- Proposed repayment of debt capital during year n+1
- Outlays on and the disposal of fixed assets during year n+1
- Changes in level of current assets during year n+1
- Changes in assets and certain outlays pre-operative and preliminary expenses during year n+1

Illustration 1

The Balance Sheet of X Ltd. at the end of year n is as follows:

		₹ in Crores	
Liabilities	₹	Assets	₹
Share capital	100	Fixed assets	180
Reserves and surplus	20	Current assets	
Secured loans	80	Cash	20
Unsecured loans	50	Receivables	80
Current liabilities	90	Inventories	<u>80</u>
Provisions	20		180
Total	360	Total	360

The projected income statement and distribution of earnings for year n+1

	(₹ in Cr)
Sales	400
Cost of goods sold	300
Depreciation	20
Earnings before interest and taxes	80
Interest	20
Profit before tax	60

Tax at 35%	21
Profit after tax	39
Dividends	10
Retained earnings	29

During year n+1 firm plans to raise secured term loan of ₹ 20 crores repay previous term loan to the extent of ₹ 5, increase unsecured loans by ₹ 10. Current liabilities and provisions expected to remain unchanged. Firm plans to acquire fixed assets worth ₹ 30, increase its inventories by ₹ 10, Receivables expected to increase by ₹ 15, other assets remain unchanged, except cash. Level of cash to be the balancing amount in the projected balance sheet.

Required: Projected Balance Sheet of X Ltd. for the year ended n+1.

Solution

Projected balances in various assets/liabilities are worked out as follows.

Projected Balances in Assets & Liabilities

₹ in Cr.				
Account Category	Opening Balance	Changes during the year		Closing Balance
Liabilities				
Share capital	100			100
Reserved and surplus	20	+29 (Retained earnings)		49
Secured loan	80	+20 (Additional term loan -5 (Repayment))		95
Unsecured loans	50	+10(Proposed increased)		60
Current liabilities	90			90
Provisions	20			<u>20</u>
		Total		<u>414</u>
Fixed Assets	180			
Investments		+30 (Additional outlay) <u>-20 (Depreciation)</u>		190
Current assets	180			
Cash	20	+19 (Bal. Fig)	39 (Bal. fig)	
Inventories	80	+10 (Proposed increase)	90	
Receivables	80	+15 (Expected increase)	95	
		Total		<u>414</u>

Projected Balance sheet

₹ in Crores			
Liabilities		Assets	
Share Capital	100	Fixed Assets	190

2.9 Strategic Financial Management

Reserve surplus	49	Current Assets		
Secured Loan	95	Cash	39	
Unsecured Loan	60	Receivables	90	
Current Liabilities	90	Inventories	<u>95</u>	224
Provisions	20			
	<u>414</u>			<u>414</u>

1.3.2.2 Projected Cash Flow Statement

Cash flow statement shows the sources and disposition of cash and the net change in cash balance.

Projected Cash Flow statement

(A) Sources of Funds

Share issue

Profit before taxation with interest added back

Depreciation provision for the year

Specific Reserves

Increase in secured medium and long-term borrowings for the project

Other medium/long term loans

Increase in unsecured loans and deposits

Increase in bank borrowings for working capital

Increase in liabilities for deferred payment (including interest)

Sale of fixed assets

Sale of investments

Other income

Total (A)

(B) Disposition of Funds

Capital expenditures for the project

Other capital expenditures

Increase in working capital

Decrease in secured medium and long-term borrowings – Financial institutions/Banks

Decrease in unsecured loans and deposits

Decrease in bank borrowings for working capital

Decrease in liabilities for deferred payments (including interest) to machinery

Increase in investments in other companies

Interest on term loans	
Interest on bank borrowings for working capital	
Taxation	
Dividends – Equity/Preference	
Other expenditures	_____
Total (B)	_____
Opening balance of cash in hand and at bank	_____
Net surplus/deficit (A - B)	_____
Closing balance of cash in hand/at bank	_____

Projected Cash Flow Statement

		₹ (Cr.)
(A)	Sources of Funds	
	Profit before tax with interest added back	80.00
	Depreciation	20.00
	Increase in secured loans	15.00
	Increase in unsecured loans	10.00
	Total	125.00
(B)	Disposition of Funds	
	Capital expenditure	30.00
	Increase in working capital	25.00
	Interest	20.00
	Taxation	21.00
	Dividends- equity	10.00
	Total	106.00
	Opening balance of cash in hand and at bank	20.00
	Net surplus/deficit (A) – (B)	19.00
	Closing balance of cash in hand and at bank	39.00

1.6 Combined Multi-Year Projections

Let us take up an illustration showing combined projection of balance sheet, sources and uses of funds statement, and cash flow statement over several years.

2.11 Strategic Financial Management

Illustration 2

The expected outlays and proposed financing during the construction of A Ltd. and the first two operating years are given hereunder:

Proposed Outlays and Financing (₹ in Cr)

	Construction Period	1 st Operating Year	2 nd Operating Year
Outlays			
Preliminary and Pre-operative Expenses	20	-	-
Fixed assets	200	200	100
Current assets (Other than cash)	-	200	100
Financing			
Share capital	100	150	-
Long Term loan	150	150	75
Short-term bank Borrowing		120	60

The projected revenues and costs for the first two operating years are given below.

Projected Revenues and Costs

(₹ in Cr.)

	1 st Operating Year	2 nd Operating Year
Sales	300	600
Cost of sales (excluding interest and depreciation)	300	400
Interest	48	64
Depreciation	20	28

With following additional assumptions, you are required to prepare Projected Cash Flow Statement of A Ltd.

- (i) The tax rate will be 35 percent,
- (ii) no deductions (relief's) are available
- (iii) preliminary and preoperative expenses will not be written off during the first two operating years, and
- (iv) no dividend will be paid in the first two operating years.

Solution

Projected Statements: The projected income statement (profit and loss statement) is prepared in the following way:

Projected Income Statement

(₹ In Cr.)

	1st Operating Year	2nd Operating Year
Sales	300	600
Cost of sales (excluding depreciation and interest)	300	400
Interest	48	64
Depreciation	20	28
Losses (absorbed)	-	68
Profit before tax	(68)	40
Tax	-	14
Profit after tax	(68)	26

From the given information, the projected balance sheets and the projected cash flow statements shall be prepared as follows:

Projected Balance Sheet

(₹ in Cr.)

Liabilities	End of Constn. Period	End of 1 st Operating Year	End of 2 nd Operating year	Assets	End of Constn. Period	End of 1 st Operating year	End of 2 nd Operating year
Share Capital	100	250	250	Fixed assets	200	380	452
Reserves and Surplus			26	Current Assets			
Long Term Loan	150	300	375	Cash (Bal. Fig.)	30	2	59
Short term Bank borrowing	-	120	180	Others	--	200	300
				Miscellaneous Current Assets			
				Preliminary and Pre-operative expense	20	20	20
				Profit and Loss account	--	68	---
	250	670	831	Balance	250	670	831

Projected Cash Flow Statement

(₹ in Cr.)

	Construction Period	1st Operating Year	2 nd Operating year
Sources of Funds			
Share issue	100	150	
Profit before taxation and Interest		(20)	172

2.13 Strategic Financial Management

Depreciation provision for the year		20	28
Increase in long-term borrowings for the project	150	150	75
Increase in bank borrowings for working capital	-	120	60
Total (A)	250	420	335
Disposition of Funds			
Capital expenditure for the Project	200	200	100
Increase in current assets	--	200	100
Interest	--	48	64
Other expenditure (Preliminary and Pre-operative expenses)	20	-	-
Taxes	-	-	14
Total (B)	220	448	278
Opening balance of cash in hand and cash at bank	-	30	2
Net surplus/deficit (A-B)	<u>30</u>	<u>(28)</u>	<u>57</u>
Closing balance of cash in hand and at bank	30	2	59

2. Contents of a Project Report

The following aspects need to be taken into account for a Project Report -

1. **Promoters:** Their experience, past records of performance form the key to their selection for the project under study.
2. **Industry Analysis:** The environment outside and within the country is vital for determining the type of project one should opt for.
3. **Economic Analysis:** The demand and supply position of a particular type of product under consideration, competitor's share of the market along with their marketing strategies, export potential of the product, consumer preferences are matters requiring proper attention in such type of analysis.
4. **Cost of Project:** Cost of land, site development, buildings, plant and machinery, utilities e.g. power, fuel, water, vehicles, technical know how together with working capital margins, preliminary/pre-operative expenses, provision for contingencies determine the total value of the project.
5. **Inputs:** Availability of raw materials within and outside the home country, reliability of suppliers cost escalations, transportation charges, manpower requirements together with effluent disposal mechanisms are points to be noted.
6. **Technical Analysis:** Technical know-how, plant layout, production process, installed and operating capacity of plant and machinery form the core of such analysis.

7. **Financial Analysis:** Estimates of production costs, revenue, tax liabilities profitability and sensitivity of profits to different elements of costs and revenue, financial position and cash flows, working capital requirements, return on investment, promoters contribution together with debt and equity financing are items which need to be looked into for financial viability.
8. **Social Cost Benefit Analysis:** Ecological matters, value additions, technology absorptions, level of import substitution form the basis of such analysis.
9. **SWOT Analysis:** Liquidity/Fund constraints in capital market, limit of resources available with promoters, business/financial risks, micro/macro economic considerations subject to government restrictions, role of Banks/Financial Institutions in project assistance, cost of equity and debt capital in the financial plan for the project are factors which require careful examinations while carrying out SWOT analysis.
10. **Project Implementation Schedule:** Date of commencement, duration of the project, trial runs, cushion for cost and time over runs and date of completion of the project through Network Analysis have all to be properly adhered to in order to make the project feasible.

2.1 Specimen of Project Feasibility Report: Submitted to Board of Directors of XYZ & Co. Ltd., a project feasibility report on the introduction of a new product 'α' in the paint market by Chief Finance Officer.

To

The Board of Directors,
XYZ & Co. Ltd.

From:

The Chief Finance Officer

Re: In depth study of a product 'α' being introduced in the market proposed

The Company proposes to introduce a new product 'α' in the paint Market at Delhi. The present study is an effort to see whether the project under consideration should be taken up or not.

1. Commercial Viability (Market)

Aim in Market Share: The in-depth market study and research reveals the following facts:

Total Demand of the product 'α' type	- 1,00,000 tonnes p.a.
Installed Capacity	- 90,000 tonnes p.a.
Production	- 80,000 tonnes p.a.
Potential Demand Gap	- 20,000 tonnes p.a.

The company proposes to manufacture 10,000 tonnes of 'α' thus aiming at 10% share of the market or 50% of unfulfilled demand.

2.15 Strategic Financial Management

Market Leader & Competition: The market leader of this group of products has a share of 40% and rest of market is shared by a number of small manufacturers. Thus company expects little competition from the market leader.

2. Technical Feasibility

Raw Materials: Raw Materials constitute a major portion of the total cost of output. In fact, 70% of value added output cost is raw material. About 5% of petroleum by-products are used as additives and these are subject to price fluctuations due to change in international prices. Such increases are passed on to the consumers in the shape of increased prices thereby keeping contribution margin intact. As government is the sole supplier of additives there is a fear that company may have to stop production if supply is discontinued.

Power: As the project will require very little power it is expected that power shortage will not create a very big hazard.

Disposal of Waste/Effluents/Pollution Control: The production process is such that it will release very little waste & effluents and so disposal is not a very great problem. Public health is thus not endangered. No special measures are required to be undertaken for pollution control.

Knowhow: As the total investment in Plant & Machinery is ₹6 lakhs and it is presumed that complex technical know how is not required.

Right Plant & Machinery: The company being the market leader in paints it has been able to select the right kind of plant & Machinery at optimum cost. As per market quotations, the cost of Plant & Machinery, seems to be reasonable.

Storage Tanks: The cost that will incur if storage tanks are erected is estimated at ₹ 2 lakhs and the expense has been considered very much necessary for the purpose.

New Factory/(Industrial Estate New Co.): The company is proposing to set up a factory nearer to the existing one where locational facilities are available (Nearness to market, transport facilities, Tax Holiday Benefits, Availability of skilled labour, free trade zone etc.)

Plant layout, Blue Print: A plant layout, blue print as per engineer's and technician's report has been attached with the schedule.

3. Financial Feasibility

a. Capital cost of the Project

	₹ (lakhs)
(1) Land & Building	5.00
(2) Plant & Machinery	6.00
(3) Other Fixed Assets including Tanks	4.00
(4) Pre Operative Expenses	1.00
(5) Margin Money for Working Capital	2.00
(6) Provision for contingencies	<u>2.00</u>
	<u>20.00</u>

b. Proposed Financing Plan

	<i>₹ (lakhs)</i>
(1) Equity Shares	5.00
(2) Retained Earnings	5.00
(3) Term Loans	<u>10.00</u>
	<u>20.00</u>

c. Repayment Schedule of Loan

A loan repayment schedule (Subject to negotiation) is being given herewith.

Years	Repayment (₹ in Lakhs)
1	-
2	2
3	2
4	2
5	2
6	<u>2</u>
Total	<u>10</u>

d. Projected Profitability and Cash Flow Statement

<i>₹ (Lakhs)</i>			
Year	Profit after Tax	Depreciation	Cash Flow
1	8.00	1.50	9.50
2	5.00	1.50	6.50
3	5.00	1.50	6.50
4	5.00	1.50	6.50
5	5.00	1.50	6.50
6	5.00	1.50	6.50
7	4.00	1.50	5.50
8	4.00	1.50	5.50
9	4.00	1.50	5.50
10	5.00	1.50	6.50
Total	50.00	15.00	65.00

2.17 Strategic Financial Management

e. Net Present Value Analysis

The cash flow of ₹ 65 lakhs when discounted at the company's cost of capital rate gives net cash flow of ₹ 30 lakhs. Hence net present value of ₹10 lakhs is available [Net Cash Flow – Capital Cost].

Thus, the project seems to be feasible.

Sd/-

Dated 30 August 20XX

Chief Finance Officer

2.2 Post Completion Audit: Post-completion audit evaluates actual performance with projected performance. It verifies both revenues and costs.

Post-completion audit is conducted when project is commissioned, or the operations of the project stabilizes, or the project is terminated, or at any other time in the life of the project. If conducted earlier review data may not be meaningful and if conducted towards end of project life utility of the lessons drawn is not useful.

The advantages of conducting a post completion audit are:

1. The experience gained is highly valuable for future decision making since it can highlight mistakes that can be avoided, and areas of improvements brought about.
2. Identify individuals with superior abilities in planning and forecasting.
3. It helps in discovering biases in judgment.
4. It induces healthy caution among the sponsors of projects as projects sponsors make over-optimistic projections for their proposals.
5. It serves as a useful training ground for promising executives needing experience and exposure into a wide range of factors like market behaviour, pricing, cost structure, input availability, productivity, regulatory environment, financial system and industrial relations.

Post Completion Audit is the most neglected aspect of capital budgeting. The reasons are

- (a) It is difficult to isolate the cash flows attributable to individual investments from financial accounts compiled as a whole and based on accrual principle. Although, this problem can overcome by using estimates and approximations where it is not possible to obtain accurate data.
- (b) Apprehension that it may be used for punitive purposes. This problem can be overcome by making it clear to project sponsors that purpose of post audit is to promote learning as it provides feedback for future improvements.

Since Post-completion audit involves effort and cost it is to be conducted for investments above a certain size.

Post-completion audit should not be entrusted to the sponsoring group since the group has a bias in favour of the project. It should be performed by an independent group consisting of economists, engineers, accountants and executives requiring training in capital budgeting.

3. Social Cost Benefit Analysis (SCBA)

3.1 What it is?

SCBA is an approach for evaluation of projects. A technique for appraising isolated projects from the point of view of society as a whole. It assesses gains/losses to society as a whole from the acceptance of a particular project. Social gains/losses (quantifiable/measurable) regarded as additions to and subtractions from something that the society desires. While UNIDO (United Nations Industrial Development Organisation) advocates aggregate consumption as unit of measurement on the other hand the OED (Oxford English Dictionary) advocates the use of uncommitted social income in the hands of the government as yardstick of measurement since consumption has both time dimension (present/future) and distributional dimension (consumption by group/region of the country).

3.2 Features

- (1) It includes many economic activities having indirect effects on which there is no possibility of putting a market value. For example, a project may have beneficial effects on the rest of society viz. training imparted to workers quitting the project before/after completion and joining other projects where trained personnel are available without any extra payment or environmental pollution causing damage to property. These are regarded as external effects for which no market compensations are made.
- (2) If savings are inadequate; money going into investment is regarded more valuable than money going into current consumption.
- (3) Society values, given quantum of additional consumption going to different sections of the population differently. So distributional considerations are important.
- (4) For society, taxes are transferred from the project in hand to government and does not involve real cost.
- (5) Relative valuation placed on future consumption compared to current consumption is different for the society. Also effect of perceived uncertainties may be different.
- (6) Society may want to discourage consumption of certain goods and promote that of others.
- (7) External effects exist on consumption side e.g. person getting inoculation against infectious disease will be conferring some benefit to society by preventing the spreading over of the disease.
- (8) Output from large projects has significant impact on the market for the goods/services and neither pre-project market price nor expected post project market price would be correct indicators of the social value of project output. Market prices are not true indicators of social gains/losses but can be suitably adjusted to reflect social valuations.

3.3 Technique of Social Cost Benefit Analysis

Estimation of Shadow Prices form the core of social cost benefit methodology. A Shadow Price reflects the social evaluation of the input or output. This value may or may not be equal

2.19 Strategic Financial Management

the market price. Since it does not have an existence apart from its use in social evaluation it is called social cost. Economic resources have been categorised into goods, services, labour, foreign exchange, shadow price of investment vis-à-vis consumption, shadow price of future consumption vis-à-vis present consumption viz. social rate of discount.

3.3.1 Goods & Services: Social gain/losses from outputs and inputs of a project are measured by the willingness of the consumers to pay for the goods. This is reflected by market price if:

- a. Perfect competition exists in all relevant markets.
- b. Project unable to make substantial additions to or withdrawals from existing supply of goods.

For consumer goods, absence of rationing/controls, condition a) as specified above is required. If rationing/control exists, market price understates willingness to pay and so upward adjustment is necessary. If condition b) as specified above is violated neither old nor new market price shall reflect the willingness to pay. However an average of the two may serve the purpose and the demand has to be estimated once again.

For producer goods in addition to absence of rationing/controls and condition b) as specified above, not only competitive conditions must prevail in the market for the goods itself but in all subsequent markets through which the goods passes in successive stages of processing.

Public irrigation project sells water to sugarcane farmers who sell cane to sugar mills. If sugar mills enjoy monopoly power in sugar markets their willingness to pay for sugarcane will be higher than market price they pay and market price farmer pays for irrigation water will understate their willingness to pay if competitive conditions existed everywhere. Society's gain from additional irrigated water higher than market price of irrigation water.

3.3.2. Labour: Social cost of labour is lower than market wage because of massive un/under employment along with traditions, changes in life style etc. Removal of labour from farms should not cause reduction in agricultural output as other members work harder to offset the loss. Employing labour on non farm activities is costless. Shadow wage is zero. Un/under employment is a seasonal phenomenon. During busy months there shall be full employment but full time withdrawal leads to reduction of output in villages. Wage rates in urban areas are higher than rural areas. Substantial migration takes place from rural areas. Every job created in urban areas at the going wage may lead to migration of more workers. Urban unemployment is a severe problem due to large influx into cities thereby straining their capacity to provide minimum basic overheads. Migrants come from productive part of labour force.

3.3.3. Foreign Exchange: Existence of extensive trade controls leads to official undervaluation of foreign exchange. Official exchange rate understates the benefit of exports and costs of imports in terms of domestic resources. An upward adjustment is necessary.

3.3.4. Social Rate of Discount: Market rate of interest does not reflect society's preference for current consumption over future consumption. Choice of social discount rate is based on value judgment about weights to be attached to the welfare of future generations compared to

that of present generations. This is treated as a parameter and computations are carried out for a number of values within a certain range. Final decision rests with the policy maker.

3.3.5. Shadow Price of Investment: Society as a whole gives importance to future generations than that accorded by private decision makers. Imperfections of capital markets lead to less than optimal total investment. Money devoted to investment in terms of immediate consumption is much more than money itself.

3.4 Other Considerations

Certain amount of redistribution benefits flow to different groups in certain proportions. Costs may not be borne by same people or not in proportion to benefits they receive. Policy makers place different weights on net benefits flowing to different sections of population, project analyst should accommodate these weights.

2. Employment is always into the analysis by low shadow wages and distributional consideration does not warrant further weight to be attached.
3. Income generated in a region through multiplier effects of direct expenditures on the project. Intangibles-increased pollution, destruction of wild life, scenic beauty etc. Effects are spread over distant future and not enough is known about nature and extent-effect on rainfall in an area due to heavy exploitation of forests for a paper mill. Quantification is not possible here.
4. Uncertainty about future outputs, inputs, timely execution is to be considered. Some expected value maximization is resorted to for incorporation of quantifiable uncertainties.

3.5 Limitations

- (i) Successful application depends upon reasonable accuracy and dependability of the underlying forecasts as well as assessment of intangibles.
- (ii) Technique does not indicate whether given project evaluated on socio-economic considerations is best choice to reach national goals or whether same resources if employed in another project would yield better results.
- (iii) Cost of evaluation by such technique could be enormous for smaller projects.
- (iv) Social Cost Benefit Analysis takes into consideration those aspects of social costs and benefits which can be quantified. Other aspects like happiness, satisfaction, aesthetic pleasure, better quality of life cannot be quantified.

4. Capital Budgeting Under Risk and Uncertainty

As discussed in the paper Financial Management at PCC/IPCC level, we have ignored risk in capital budgeting decisions.

Risk denotes variability of possible outcomes from what was expected. Standard Deviation is perhaps the most commonly used tool to measure risk. It measures the dispersion around the mean of some possible outcome.

If investors are risk averse, the management shall be duty bound to select investment proposals after doing a careful analysis of the risk associated. Because investment proposals

2.21 Strategic Financial Management

contain different degrees of business risk, it is necessary to analyse not only their expected profitability but also the possible deviations from those expectations. When this is done, risk is expressed in terms of the dispersion of the probability distribution of possible net present values or possible internal rates of return and is measured by the standard deviation.

Consider an example of a single project in which the cash flows are independent from period to period. Following details are provided,

Table 1

Period 1		Period 2		Period 3	
Probability	Net Cash Flows	Probability	Net Cash Flows	Probability	Net Cash Flows
0.10	₹3000	0.10	₹2000	0.10	₹2000
0.25	₹4000	0.25	₹3000	0.25	₹3000
0.30	₹5000	0.30	₹4000	0.30	₹4000
0.25	₹6000	0.25	₹5000	0.25	₹5000
0.10	₹7000	0.10	₹6000	0.10	₹6000

Independent cash flows from period to period implies that the outcome in period t does not depend upon what had happened in period $t-1$.

As you would have noticed, there are several projections for the same period having different probabilities attached to themselves. Multiple probabilities along with multiple projections of cash flows shall result in possible multiple NPVs and IRRs. The mean of the probability distribution of possible net present values is calculated by using the following formula;

$$NPV = \sum_{t=1}^n \frac{\bar{A}_t}{(1+R_f)^t}$$

Where \bar{A}_t is the expected net cash flow in period t , R_f is the risk free rate and n is the number of periods over which the cash flows are expected.

We use the risk-free rate as the rate of discounting because our immediate task is to ascertain the riskiness of the investment because of which we need to isolate the time value of money. In case we include a premium for risk in the discount rate e.g. in cases where cost of capital is used as the discounting factor, we resort to imbibed double counting with respect to our analysis. This happens because the premium of risk imbibed in the discount helps address the risk by itself in the discounting process. A subsequent analysis of risk over such a risk adjusted result would be a second-time adjustment and hence would be inappropriate.

Standard Deviation – The following formula may be used to compute this important measure of dispersion.

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

Where σ_t is the standard deviation of possible net cash flows in period t.

In the example above the standard deviation of possible net cash flows in periods 1,2 and 3 is ₹ 1,140. Using a risk free rate of 6% the standard deviation shall work out to be ₹ 1,761. Also if we employ the same risk free rate in the equation for the mean of the probability distribution of NPV, the latter would work out as ₹ 1,635. Assuming a normal probability distribution, it shall be possible to compute the probability of an investment proposal providing more or less than a specific amount.

The concept of risk till now has been applied for NPV computation. The same concept holds true for IRR also.

We have examined the case of 'serially independent cash flows' over time. However, frequently we come across situations where the cash flows of time period 't+1' is dependent on the cash flows of time period 't'. For example, the level of marketing capabilities of a firm to push through its products in time 't+1' will invariably depend on the market share it has carved for its products in time period't'. This temporal dependency has two following possibilities, arising from the potency of the cash flow impact:

1. *Cash flows are perfectly correlated over time:* In cases where cash flows in period t + 1 are entirely dependent upon what happened in period t then perfect correlation is said to exist. In such cases, standard deviation is computed using the following formula,

$$\sigma = \sum_{t=1}^n \frac{\sigma_t}{(1+R_f)^t}$$

In case we compute the standard deviation from the data given in Table 1 assuming perfect correlation, we shall arrive at ₹ 3,047 which is significantly higher than the ₹ 1,761 computed with assumptions of serial independence.

2. *Cash flows are moderately correlated over time:* In cases where cash flows are moderately correlated over time, the standard deviation is computed as follows:

$$\sigma = \sqrt{\sum_{t=1}^n (NPV_t - \overline{NPV})^2 P_t}$$

Where NPV_t is the net present value for series t of net cash flows covering all periods, \overline{NPV} is the mean net present value of the proposal and P_t is the probability of occurrence of that specific series.

This calculation of the standard deviation is illustrated below:-

2.23 Strategic Financial Management

Illustration 3

S Ltd finds an opportunity to invest in a 2-year project and will cost ₹ 1 lakh. The estimated cash flows for the first year is given in the following table:-

- Year 1 ₹ 40,000 with probability of 30% (Scenario 1)
- Year 1 ₹ 60,000 with probability of 40% (Scenario 2)
- Year 1 ₹ 80,000 with probability of 30% (Scenario 3)

The second year cash flows with conditional probability are

- Scenario 1 - ₹ 20,000 with probability of 20%
- Scenario 1 - ₹ 50,000 with probability of 60%
- Scenario 1 – ₹ 80,000 with probability of 20%
- Scenario 2 - ₹ 70,000 with probability of 30%
- Scenario 2 - ₹ 80,000 with probability of 40%
- Scenario 2 – ₹ 90,000 with probability of 30%
- Scenario 3 - ₹ 80,000 with probability of 10%
- Scenario 3 - ₹ 1,00,000 with probability of 80%
- Scenario 3 – ₹ 1,20,000 with probability of 10%

If the relevant cost of capital to evaluate is 8% (risk free rate), find the NPV and Risk of the Project.

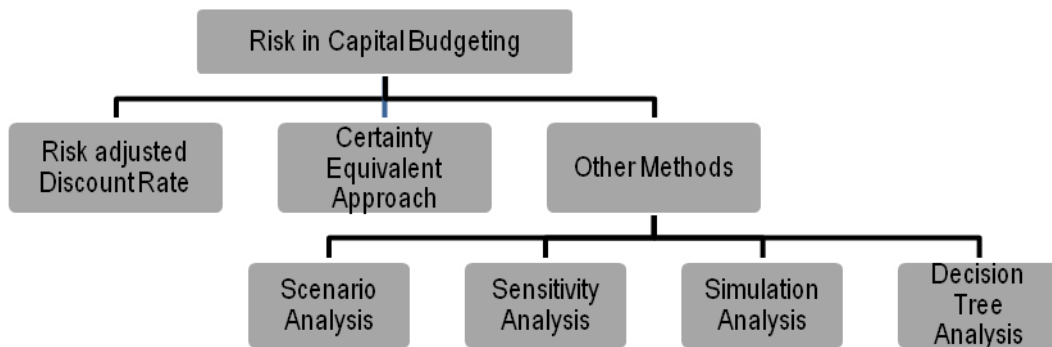
Solution

				PVIF ₁	PVIF ₂					
				0.9259	0.8573					
1	2	3	4	5	6	7	8	9	10	11
CF _{t=1}	Prob. _{t=1}	CF _{t=2}	Prob. _{t=2}	Col.1 x PVIF ₁	Col.2 x PVIF ₂	Col.6+ Col.7-100000	Jt. Prob.	NPV _j	NPV _j -Exp.NPV	Sq. deviations x Jt. Prob.*
40,000	30%	20,000	20%	37,036	17,146	-45,818	6.00%	-2,749	-24,314	5911,70,596
40,000	30%	50,000	60%	37,036	42,865	-20,099	18.00%	-3,618	-25,183	6341,83,489
40,000	30%	80,000	20%	37,036	68,584	5,620	6.00%	337	-21,228	4506,27,984
60,000	40%	70,000	30%	55,554	60,011	15,565	12.00%	1,868	-19,697	3879,71,809
60,000	40%	80,000	40%	55,554	68,584	24,138	16.00%	3,862	-17,703	3133,96,209
60,000	40%	90,000	30%	55,554	77,157	32,711	12.00%	3,925	-17,640	3111,69,600
80,000	30%	80,000	10%	74,072	68,584	42,656	3.00%	1,280	-20,285	4114,81,225
80,000	30%	100,000	80%	74,072	85,730	59,802	24.00%	14,352	-7,213	520,27,369
80,000	30%	120,000	10%	74,072	102,876	76,948	3.00%	2,308	-19,257	3708,32,049
							100.00%		σ ²	35228,60,330
Expected NPV								21,565	σ	18,623

* Calculated using Excel.

It should be noted that SD as a measure of risk becomes a difficult proposition in complex situations. Risks of the project may be assessed by (i) Simulation Analysis (ii) Sensitivity Analysis, which are discussed later on.

Methods of Incorporating Risk: The methods of incorporating risk into capital budgeting analysis can be broadly categorised as follows:



We shall now discuss each of the above methods in detail in forthcoming sections.

4.1 Risk Adjusted Discount Rate Method

The use of risk adjusted discount rate is based on the concept that investors demands higher returns from the risky projects. The required return of return on any investment should include compensation for delaying consumption equal to risk free rate of return, plus compensation for any kind of risk taken on. The case, risk associated with any investment project is higher than risk involved in a similar kind of project, discount rate is adjusted upward in order to compensate this additional risk borne.

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

Adjusting discount rate to reflect project risk- If risk of project is greater than, equal to, less than risk of existing investments of firm, discount rate used is higher than, equal to or less than average cost of capital as the, case may be.

Firms used different discount rate related to risk factor for different types of investment projects. Discount rate is low for routine replacement investments, moderate for expansion investments and high for new investments.

Usually companies classify projects based on their type, and apply pre-determined risk premiums. One such classification could be

1. Replacement projects in existing business
2. Balancing equipments in existing projects
3. Marginal increase in capacity

2.25 Strategic Financial Management

4. Significant increase in capacity (organic growth)
5. Forward or backward integration projects
6. Diversification projects
7. Foreign projects

For instance, a company could lay down the guidelines, based on its risk preferences (risk-return appetite) as below :

Normal risk premium on existing projects ($R_f + RP$) = 14%

Therefore, for all the project classifications in previous slide, the chart could look like:

Replacement projects in existing business	14% + 0%
Balancing equipments in existing projects	14% + 0%
Marginal increase in capacity	14% + 0%
Significant increase in capacity (organic growth)	14% + 2%
Forward or backward integration projects	14% + 3%
Diversification projects	14% + 5%
Foreign projects	14% + x% + y%

(The company could further classify countries into greater risk categories – for example, projects in Afghanistan would have much higher risk premium than in Finland or Sweden)

Limitations:

- (1) Difficult to estimate d_k consistently - determined by adhoc basis.
- (2) Risk increases with time at constant rate - not a valid assumption.

Risk Adjusted Discount Rate for Project 'k' is given by

$$r_k = i + n + d_k$$

Where,

i → risk free rate of interest.

n → adjustment for firm's normal risk.

d_k → adjustment for different risk of project 'k'.

r_k → firm's cost of capital.

d_k is positive/negative depending on how the risk of the project under consideration compares with existing risk of firms. Adjustment for different risk of project 'k' depends on management's perception of project risk and management's attitude towards risk (risk - return preference).

If the project's risk adjusted discount rate (r_k) is specified, the project is accepted if NPV is positive.

$$NPV = \sum_{t=1}^n A_t / (1 + r_k)^t - I$$

$A_t \rightarrow$ expected cash flow for year 't'.

$r_k \rightarrow$ risk adjusted discount rate for project 'k'.

Illustration 4

A pencil manufacturing company is considering the introduction of a line of gel pen with an expected life of five years. In the past the firm has been quite conservative in its investment in new projects, sticking primarily to standard pencils. In this context, the introduction of a line of gel pen is considered an abnormal risky project. The CEO of the company is of opinion that the normal required rate of return for the company of 12% is not sufficient. Therefore, the minimum acceptable rate of return of this project should be 18%. The initial outlay of the project is ₹ 10,00,000 and the expected free cash flows from the projects are given below:

Year	Cash Flow
1	₹ 2,00,000
2	₹ 3,00,000
3	₹ 4,00,000
4	₹ 3,00,000
5	₹ 2,00,000

Solution

$$\begin{aligned}
 NPV &= 2,00,000/(1.18)^1 + 3,00,000/(1.18)^2 + 4,00,000/(1.18)^3 + 3,00,000/(1.18)^4 + 2,00,000/(1.18)^5 - 10,00,000 \\
 &= (-) ₹ 1,29,442
 \end{aligned}$$

Project not feasible.

4.2 Certainty Equivalent Approach (CE Approach)

This approach allows the decision maker to incorporate his or her utility function into the analysis. In this approach a set of risk less cash flow is generated in place of the original cash flows.

It is based on game theory. Suppose on tossing out a coin, if it comes head you will get ₹ 10,000 and if it comes out to be tail, you will win nothing. Thus you have 50% chances of winning and expected value is ₹ 5,000. In such case if you are indifferent at receiving ₹ 3,000 for a certain amount and not playing then ₹ 3,000 will be certainty equivalent and 0.3 (i.e. 3,000/10,000) will be certainty equivalent coefficient.

Students may remember a popular game show on TV called "Deal or No Deal". The entire game is based on the Certainty Equivalent Approach. The participant is asked by the 'Banker' (hidden to the viewers and participants) periodically whether he/she would accept a certain amount (say ₹ 225,000) in exchange for the sum of uncertain amounts left in 'more than one closed box' (say the expected value of the same could be ₹ 275,000). Depending upon the

2.27 Strategic Financial Management

risk appetite of the 'player', the player would call 'NO DEAL' for the offer and continue to play the game or accept the offer and call it a DEAL.

The takeaway here is that someone else may not have as much of fear of risk as you do and as a result, you will have a different certainty equivalent.

Steps in the Certainty Equivalent (CE) approach

Step 1: Remove risk by substituting equivalent certain cash flows from risky cash flows. This can be done by multiplying each risky cash flow by the appropriate α_t value (CE coefficient)

Step 2: Discounted value of cash flow is obtained by applying risk less rate of interest. Since you have already accounted for risk in the numerator using CE coefficient, using the cost of capital to discount cash flows will tantamount to double counting of risk.

Step 3: After that normal capital budgeting method is applied except in case of IRR method, where IRR is compared with risk free rate of interest rather than the firm's required rate of return.

Note: If CE coefficient is not given then we shall compute it as follows:

$$\alpha_t = \frac{\text{Certain cash flow}}{\text{Risky or expected cash flow}_t}$$

The main problem with this method is that it is arbitrary. Two persons may have different perception about for a project. Due to this reason this method is not often used.

Thus Certainty Equivalent reflects two aspects:

- (a) Variability of outcomes.
- (b) Attitude towards risk.

Certainty Equivalent Coefficients transform expected values of uncertain flows into their Certainty Equivalents.

It is important to note that the value of Certainty Equivalent Coefficient lies between 0 & 1. Certainty Equivalent Coefficient 1 indicates that the cash flow is certain or management is risk neutral. In industrial situation, cash flows are generally uncertain and managements are usually risk averse.

$$NPV_{CE} = -INV + \sum_{t=1}^n \frac{\alpha_t \times NCF_t}{(1+r_f)}$$

Where,

α is the certainty equivalent coefficient of the Net Cash flow of year 't'

INV is the investment in the project

NCF_t is the Net cash flow of year 't'

r_f is the risk free interest rate

Illustration 5

Investment Proposal - ₹ 45,00,000

Year	Expected cash flow	Certainty Equivalent coefficient
1	₹ 10,00,000	0.90
2	₹ 15,00,000	0.85
3	₹ 20,00,000	0.82
4	₹ 25,00,000	0.78

Assuming $i = 5\%$, calculate NPV.

Solution

$$N. P. V. = 10,00,000(0.90)/(1.05) + 15,00,000(0.85)/(1.05)^2 + 20,00,000(0.82)/(1.05)^3 + 25,00,000(0.78) / (1.05)^4 - 45,00,000 = ₹ 5,34,570$$

Certainty Equivalent Method is superior to Risk Adjusted Discount Rate Method as it does not assume that risk increases with time at constant rate. Each year's Certainty Equivalent Coefficient is based on level of risk impacting its cash flow. Despite its soundness, it is not preferable like Risk Adjusted Discount Rate Method. It is difficult to specify a series of Certainty Equivalent Coefficients but simple to adjust discount rates.

Illustration 6

XYZ PLC employs certainty-equivalent approach in the evaluation of risky investments. The finance department of the company has developed the following information regarding a new project:

Year	Expected CFAT	Certainty-equivalent quotient
0 (Initial Outlays)	(£ 200,000)	1.0
1	£ 160,000	0.8
2	£ 140,000	0.7
3	£ 130,000	0.6
4	£ 120,000	0.4
5	£ 80,000	0.3

The firm's cost of equity capital is 18%; its cost of debt is 9% and the riskless rate of interest in the market on the treasury bonds is 6%. Should the project be accepted?

Solution

Determination of NPV:

Year	Expected CFAT	Certainty-equivalent (CE)	Adjusted CFAT (CFAT X CE)	PV factor (at 0.06)	Total PV
0	(£ 200,000)	1.0	£ (200,000)	1.000	(£ 200,000)
1	£ 160,000	0.8	£ 128,000	0.943	£ 120,704

2.29 Strategic Financial Management

2	£ 140,000	0.7	£ 98,000	0.890	£ 87,220
3	£ 130,000	0.6	£ 78,000	0.840	£ 65,520
4	£ 120,000	0.4	£ 48,000	0.792	£ 38,016
5	£ 80,000	0.3	£ 24,000	0.747	£ 17,928
NPV					129,388

Since NPV is positive the project should be accepted.

4.3 Other Methods

4.3.1 Sensitivity Analysis

Also known as "What if" Analysis. Till now in our analysis we have assumed that all the quantitative factors in the investment decisions i.e. cash inflows, outflows, cost of capital (discount rate) and duration of the project are known with certainty, whereas it rarely happens. Sensitivity analysis helps to overcome this problem. It should be noted sensitivity analysis can be applied to a variety of planning activities not just to capital budgeting decisions.

This analysis determines how the distribution of possible NPV or internal rate of return for a project under consideration is affected consequent to a change in one particular input variable. This is done by changing one variable at one time, while keeping other variables (factors) unchanged. Sensitivity analysis begins with the base-case situation which is developed using the expected values for each input. It provides the decision maker with the answers to a whole range of "what if" question. For example, what is NPV, if the selling price falls by 10%. Similarly what will be IRR if project's life is only 3 years instead of expected 5 years. This analysis can also be used to compute Break-even points. For example, revenue required to meet costs (i.e., break-even level of volume) in net present value terms.

Sensitivity analysis is widely used because of its simplicity and ability to focus on particular estimates. It is widely used by the bankers while evaluation of the projects for funding.

4.3.1.1 Advantages of Sensitivity Analysis: Following are main advantages of Sensitivity Analysis

- (1) Critical Issues: This analysis identifies critical factors that impinge on a project's success or failure.
- (2) Simplicity: This analysis is quite simple.

4.3.1.2 Disadvantage of Sensitivity Analysis: Following are main disadvantages of Sensitivity Analysis

- (1) Assumption of Independence: This analysis assumes that all variables are independent i.e. they are not related to each other, which is unlikely in real life.
- (2) Ignore probability: This analysis does not look to the probability of changes in the variables.
- (3) Not so reliable: This analysis provides information on the basis of which decisions can be made but does not point directly to the correct decision.

This analysis can broadly take following two forms:

- (a) Determine the extent to which each variable could be changed to make NPV equal to zero.
- (b) Another form is to determine the impact on NPV of a specific percentage change in the selected variable keeping other variables static.

Further, since we know that if NPV of a project is positive, the project is approved and if it is negative, it is rejected. Therefore, a decision might also be interested in knowing how sensitive the advice is to changes in the estimation made for the project under consideration.

This can be computed by using the formula of Margin of Error as follows:

Margin of Error or Sensitivity Margin = NPV of Project / PV of Cash flows relating to particular variable

Thus, it can be said that Margin of Error is % change required in variable to take NPV to zero and zero NPV becomes Decision Pivot Point. Lower the Margin Error, the more sensitive the decision to the particular variable under consideration.

Illustration 7

A project has a NPV of ₹ 85,400 at discounting rate of 12%. The manager has some uncertainty about the cost of ₹ 10,00,000 at Year 2. You are required to determine % increase in this cost which would make NPV negative i.e. project non-viable.

Solution

PV of Cost @ 12% rate after Year 2

$$= \frac{10,00,000}{(1.12)^2} = ₹ 797194$$

$$\% \text{ Increase in cost to make NPV negative} = \frac{85400}{797194} = ₹ 0.10713 \text{ or say } 11\%$$

Illustration 8

The following information applies to a new project:

<i>Initial Investment</i>	₹ 125,000
<i>Selling price per Unit</i>	₹ 100
<i>Variable costs per unit</i>	₹ 30
<i>Fixed costs for the period</i>	₹ 100,000
<i>Sales volume</i>	2,000 units
<i>Life</i>	5 years
<i>Discount rate</i>	10%

Required: Project's NPV and show how sensitive the results are to various input factors.

2.31 Strategic Financial Management

Solution

$$\text{NPV} = -125,000 + [(100 - 30) 2,000 - 100,000] \times 3.791 = ₹ 26,640$$

Sensitivity to changes to

(1) Selling price

$$125,000 = [(P - 30) 2,000 - 100,000] \times 3.791$$

$$32,973 = 2,000P - 60,000 - 100,000$$

$$P = 96.49$$

i.e. fall of 3.51% $\left(\frac{96.49 - 100}{100}\right)$ before NPV is zero.

Alternatively

$$₹ 26,640$$

$$2,000 \times ₹ 100 \times 3.791$$

(2) Variable costs

$$125,000 = [(100 - v) 2,000 - 100,000] \times 3.791$$

$$32,973 = 200,000 - 2000V - 100,000$$

$$V = 33.51$$

i.e. increase of 11.71% $\left(\frac{33.51 - 30}{30}\right)$ before NPV is zero.

Alternatively

$$₹ 26,640$$

$$2,000 \times ₹ 30 \times 3.791$$

(3) Volume

$$125,000 = [(100 - 30) q - 100,000] \times 3.791$$

$$32,973 = 70q - 100,000$$

$$q = 1,900$$

in fall of 5.0% $\left(\frac{1900 - 2000}{2000}\right)$ before NPV is zero.

Alternatively

$$₹ 26,640$$

$$2,000 \times ₹(100 - 30) \times 3.791$$

(4) Initial cost

$$₹ (125,000 + 26,640) = ₹ 151,640$$

i.e. increase of 21.31% $\left(\frac{151640 - 125000}{125000}\right)$ before NPV is

zero.

Alternatively

$$₹ 26,640$$

$$₹ 125,000$$

(5) Fixed costs

$$125,000 = [(\₹ 100 - ₹ 30) 2,000 - F] \times 3.791$$

$$32,973 = 140,000 - F$$

$$F = 107,027$$

i.e. an increase of 7.03% $\left(\frac{107027 - 100000}{100000}\right)$ before NPV is zero

Alternatively

$$₹ 26,640$$

$$₹ 100,000 \times 3.791$$

(6) Life

$$₹125,000 = ₹ 40,000 \times AF_n @ 10\%$$

$$3.125 = AF_n @ 10\%$$

AF for 4 years at 10% is 3.17

i.e. life can fall to approximately 4 years before NPV is zero.

(7) Discount rate

$$3.125 = AF \text{ for 5 years } @ x \%$$

From tables AF for 5 year @ 18% is 3.127, so x is approximately 18%

i.e. an increase of 80% $\left(\frac{18\% - 10\%}{10\%} \right)$ before NPV is zero.

4.3.2 Scenario Analysis :Although sensitivity analysis is probably the most widely used risk analysis technique, it does have limitations. Therefore, we need to extend sensitivity analysis to deal with the probability distributions of the inputs. In addition, it would be useful to vary more than one variable at a time so we could see the combined effects of changes in the variables.

Scenario analysis provides answer to these situations of extensions. This analysis brings in the probabilities of changes in key variables and also allows us to change more than one variable at a time.

This analysis begins with base case or most likely set of values for the input variables. Then, go for worst case scenario (low unit sales, low sale price, high variable cost and so on) and best case scenario.

In other words, scenario analysis answers the question “How bad could the project look”. Some enthusiastic managers can sometimes get carried away with the most likely outcomes and forget just what might happen if critical assumptions such as the state of the economy or competitors’ reaction are unrealistic. This analysis seek to establish ‘worst and best’ scenarios so that whole range of possible outcomes can be considered.

Although, the analysis appears to be simple, but it contains four critical components:

1. The first component involves determining the factors around which the scenarios will be built. These factors can range from the state of economy to the response of competitors on any action of the firm.
2. Second component is determining the number of scenarios to analysis for each factor. Normally three scenarios are considered in general i.e. a best case, an average and a worst case. However, they may vary on long range.
3. Third component is to place focus on critical factors and build relatively few scenarios for each factor.
4. Fourth component is the assignment of probabilities to each scenarios. This assignment may be based on the macro factors e.g. exchange rates, interest rates etc. and micro factors e.g. competitor’s reactions etc.

2.33 Strategic Financial Management

In conclusion, we can say that when we calculate the NPV of several scenarios we are performing a scenario analysis.

Illustration 9

XYZ Ltd. is considering a project "A" with an initial outlay of ₹ 14,00,000 and the possible three cash inflow attached with the project as follows:

	(₹000)		
	Year 1	Year 2	Year 3
Worst case	450	400	700
Most likely	550	450	800
Best case	650	500	900

Assuming the cost of capital as 9%, determine whether project should be accepted or not.

Solution

The possible outcomes will be as follows:

Year	PVF @9%	Worst Case		Most likely		Best case	
		Cash Flow '000	PV '000	Cash Flow '000	PV '000	Cash Flow '000	PV '000
0	1	(1400)	(1400)	(1400)	(1400)	(1400)	(1400)
1	0.917	450	412.65	550	504.35	650	596.05
2	0.842	400	336.80	450	378.90	500	421.00
3	0.772	700	540.40	800	617.60	900	694.80
NPV			-110.15		100.85		311.85

Now suppose that CEO of XYZ Ltd. is bit confident about the estimates in the first two years, but not sure about the third year's high cash inflow. He is interested in knowing what will happen to traditional NPV if 3rd year turn out the bad contrary to his optimism.

The NPV in such case will be as follows:

$$\begin{aligned}
 &= -₹ 1400000 + \frac{550000}{(1+0.09)} + \frac{450000}{(1+0.09)^2} + \frac{700000}{(1+0.09)^3} \\
 &= -₹ 1400000 + ₹ 504587 + ₹ 378756 + ₹ 540528 = ₹ 23871
 \end{aligned}$$

Thus, CEO's concern is well founded that, as a worst case in the third year alone yield a marginally positive NPV.

4.3.3. Simulation Analysis (Monte Carlo): Monte Carlo simulation ties together sensitivities and probability distributions. The method came out of the work of first nuclear bomb and was so named because it was based on mathematics of Casino gambling. Fundamental appeal of this analysis is that it provides decision makers with a probability distribution of NPVs rather than a single point estimates of the expected NPV.

This analysis starts with carrying out a simulation exercise to model the investment project. It involves identifying the key factors affecting the project and their inter relationships. It involves modeling of case flows to reveal the key factors influencing both cash receipt and payments and their inter relationship.

This analysis specifies a range for a probability distribution of potential outcomes for each of model's assumptions.

4.3.3.1 Steps for Simulation Analysis:

1. Modelling the project: The model shows the relationship of NPV with parameters and exogenous variables. (Parameters are input variables specified by decision maker and held constant over all simulation runs. Exogenous variables are input variables, which are stochastic in nature and outside the control of the decision maker).
2. Specify values of parameters and probability distributions of exogenous variables.
3. Select a value at random from probability distribution of each of the exogenous variables.
4. Determine NPV corresponding to the randomly generated value of exogenous variables and pre-specified parameter variables.
5. Repeat steps (3) & (4) a large number of times to get a large number of simulated NPVs.
6. Plot probability distribution of NPVs and compute a mean and Standard Deviation of returns to gauge the project's level of risk.

Example: *Uncertainty associated with two aspects of the project: Annual Net Cash Flow & Life of the project. NPV model for the project is*

$$\sum_{t=1}^n [CF_t / (1+i)^t] - I$$

Where $i \rightarrow$ Risk free interest rate, $I \rightarrow$ initial investment are parameters, $CF =$ Annual Cash Flow

With $i = 10\%$, $I = ₹ 1,30,000$, CF_t & n stochastic exogenous variables with the following distribution will be as under:

Annual Cash Flow		Project Life	
Value (₹)	Probability	Value (Year)	Probability
10,000	0.02	3	0.05
15,000	0.03	4	0.10
20,000	0.15	5	0.30
25,000	0.15	6	0.25
30,000	0.30	7	0.15
35,000	0.20	8	0.10
40,000	0.15	9	0.03
		10	0.02

2.35 Strategic Financial Management

Ten manual simulation runs are performed for the project. To perform this operation, values are generated at random for the two exogenous variables viz., Annual Cash Flow and Project Life. For this purpose, we take following steps

- (1) set up correspondence between values of exogenous variables and random numbers
- (2) choose some random number generating device.

Correspondence between Values of Exogenous Variables and two Digit Random Numbers:

Annual Cash Flow				Project Life			
Value (₹)	Probability	Cumulative Probability	Two Digit Random No.	Value (Year)	Probability	Cumulative Probability	Two Digit Random No.
10,000	0.02	0.02	00 – 01	3	0.05	0.05	00 – 04
15,000	0.03	0.05	02 – 04	4	0.10	0.15	05 – 14
20,000	0.15	0.20	05 – 19	5	0.30	0.45	15 – 44
25,000	0.15	0.35	20 – 34	6	0.25	0.70	45 – 69
30,000	0.30	0.65	35 – 64	7	0.15	0.85	70 – 84
35,000	0.20	0.85	65 – 84	8	0.10	0.95	85 – 94
40,000	0.15	1.00	85 - 99	9	0.03	0.98	95 – 97
				10	0.02	1.00	98 - 99

Random Number

53479	81115	98036	12217	59526
97344	70328	58116	91964	26240
66023	38277	74523	71118	84892
99776	75723	03172	43112	83086
30176	48979	92153	38416	42436
81874	83339	14988	99937	13213
19839	90630	71863	95053	55532
09337	33435	53869	52769	18801
31151	58295	40823	41330	21093
67619	52515	03037	81699	17106

For random numbers, we can begin from any-where taking at random from the table and read any pair of adjacent columns, column/row wise. For the first simulation run we need two digit random numbers (1) For Annual Cash Flow (2) For Project Life. The numbers are 53 & 97 and corresponding value of Annual Cash Flow and Project Life are ₹ 3,000 and 9 years respectively.

Simulation Results

Annual Cash Flow			Project Life			
Run	Random No.	Corres. Value of Annual Cash Flow (1)	Random No.	Corres. Value of Project Life	PVAF @ 10% (2)	NPV (1)x(2) – 1,30,000
1	53	30,000	97	9	5.759	42,770
2	66	35,000	99	10	6.145	85,075
3	30	25,000	81	7	4.868	(8,300)
4	19	20,000	09	4	3.170	(66,600)
5	31	25,000	67	6	4.355	(21,125)
6	81	35,000	70	7	4.868	40,380
7	38	30,000	75	7	4.868	16,040
8	48	30,000	83	7	4.868	16,040
9	90	40,000	33	5	3.791	21,640
10	58	30,000	52	6	4.355	650

4.3.3.2. Advantages of Simulation Analysis: Strength lies in Variability.

- (1) Handle problems characterised by (a) numerous exogenous variables following any kind of distribution. (b) complex inter-relationships among parameters, exogenous variables and endogenous variables. Such problems defy capabilities of analytical methods.
- (2) Compels decision maker to explicitly consider the inter-dependencies and uncertainties featuring the project.

4.3.3.3 Shortcomings

- (1) Difficult to model the project and specify probability distribution of exogenous variables .
- (2) Simulation is inherently imprecise. Provides rough approximation of probability distribution of NPV Due to its imprecision, simulation probability distribution may be misleading when a tail of distribution is critical.
- (3) Realistic simulation model being likely to be complex would probably be constructed by management expert and not by the decision maker. Decision maker lacking understanding of the model may not use it.
- (4) Determine NPV in simulation run, risk free discount rate is used. It is done to avoid pre-judging risk, which is reflected in the dispersion of the distribution of N.P.V. This derived measure of NPV takes a different meaning from its original value, and, therefore, is difficult to interpret.

4.3.4. Decision Tree Analysis: Till now we have discussed simple accept-or-reject decisions which view current investments in isolation of subsequent decisions. However, practically investment decisions may have implications for future or further investment decisions, and

2.37 Strategic Financial Management

may also impact future decision and events. Such situation can be handled by taking a sequence of decisions over a period of time. The technique to handle this type of sequential decisions is done through "Decision Tree" technique.

Basically, decision tree is a graphic display of the relationship between a present decision and future events, future decision and their consequences.

This approach assumes that there are only two types of situation that a finance manager has to face. The first situation is where the manager has control or power to determine what happens next. This is known as "Decision", as he can do what he desires to do.

The second situation is where finance manager has no control over what happens next. This is known as "Event". Since the outcome of the events is not known, a probability distribution needs to be assigned to the various outcomes or consequences. It should, however, be noted when a finance manager faced with a decision situation, he is assumed to act rationally. For example, in a commercial business, he will choose the most profitable course of action and in non-profit organization, the lowest cost may be rational choice.

4.3.4.1 Steps involved in Decision Tree analysis:

Step 1- Define Investment: Decision tree analysis can be applied to a variety of business decision-making scenarios. Normally it includes following types of decisions.

- Whether or not to launch a new product, if so, whether this launch should be local, national, or international.
- Whether extra production requirement should be met by extending the factory or by out sourcing it to an external supplier.
- Whether to dig for oil or not if so, upto what height and continue to dig even after finding no oil upto a certain depth.

Step 2- Identification of Decision Alternatives: It is very essential to clearly identify decision alternatives. For example if a company is planning to introduce a new product, it may be local launch, national launch or international launch.

Step 3- Drawing a Decision Tree: After identifying decision alternatives, at the relevant data such as the projected cash flows, probability distribution expected present value etc. should be put in diagrammatic form called decision tree.

While drawing a decision tree, it should be noted that NPVs etc. should be placed on the branches of decision tree, coming out of the decisions identified.

While drawing a decision tree, it should be noted that the:-

- The decision point (traditionally represented by square), is the option available for manager to take or not to take - in other words action at these points.
- The event or chance or outcome (traditionally represented by circle) which are dependent on chance process, along with the probabilities thereof, and monetary value associated with them.
- This diagram is drawn from left to right.

Step 4- Evaluating the Alternatives: After drawing out the decision the next step is the evaluation of alternatives. The various alternatives can be evaluated as follows:

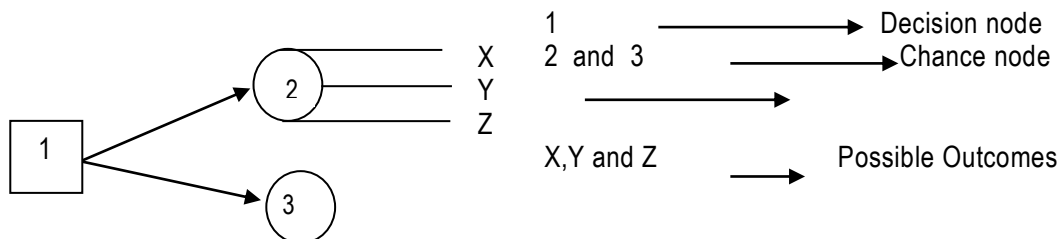
- (i) This procedure is carried out from the last decision in the sequence (extreme right) and goes on working back to the first (left) for each of the possible decision.
- (ii) At each final stage decision point, select the alternative which has the highest NPV and truncate the other alternatives. Each decision point is assigned a value equal to the NPV of the alternative selected at the decision point.
- (iii) Proceed backward in the same manner calculating the NPV at chance or event or outcome points (○) selecting the decisions alternative which has highest NPV at various decision points [□] rejecting the inferior decision option, assigning NPV to the decision point, till the first decision point is reached.

In Capital Budgeting, the decision taker has to identify and find out the various alternatives available to an investment decision. By drawing a decision tree, the alternatives are highlighted through a diagram, giving the range of possible outcomes. The stages set for drawing a decision tree is based on the following rules.

1. It begins with a decision point, also known as decision node, represented by a rectangle while the outcome point, also known as chance node, denoted by a circle.
2. Decision alternatives are shown by a straight line starting from the decision node.
3. The Decision Tree Diagram is drawn from left to right. Rectangles and circles have to be sequentially numbered.
4. Values and Probabilities for each branch are to be incorporated next.

The Value of each circle and each rectangle is computed by evaluating from right to left. This procedure is carried out from the last decision in the sequence and goes on working back to the first for each of the possible decisions. The following rules have been set for such evaluation.

- (a) The expected monetary value (EMV) at the chance node with branches emanating from a circle is the aggregate of the expected values of the various branches that emanate from the chance node.
- (b) The expected value at a decision node with branches emanating from a rectangle is the highest amongst the expected values of the various branches that emanate from the decision node.



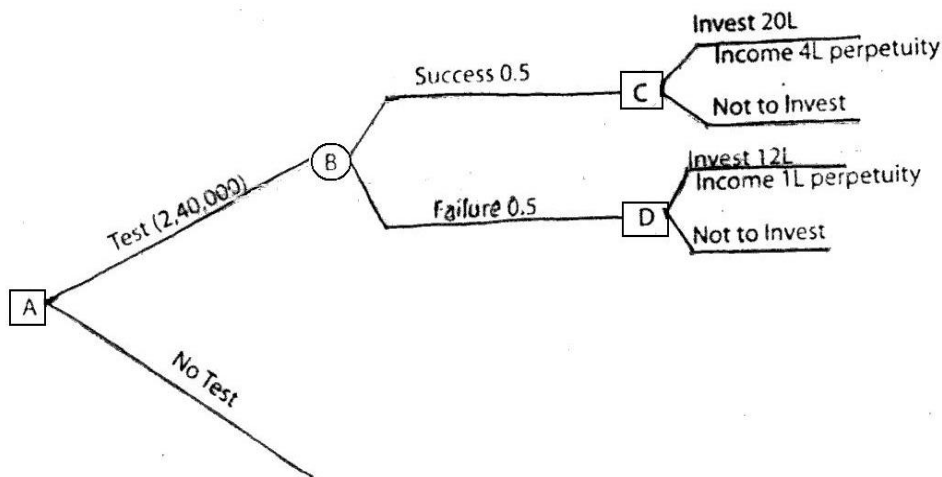
2.39 Strategic Financial Management

Illustration 10

L & R Limited wishes to develop new virus-cleaner software. The cost of the pilot project would be ₹ 2,40,000. Presently, the chances of the product being successfully launched on a commercial scale are rated at 50%. In case it does succeed, L&R can invest a sum of ₹ 20 lacs to market the product. Such an effort can generate perpetually, an annual net after tax cash income of ₹ 4 lacs. Even if the commercial launch fails, they can make an investment of a smaller amount of ₹ 12 lacs with the hope of gaining perpetually a sum of ₹ 1 lac. Evaluate the proposal, adopting decision tree approach. The discount rate is 10%.

Solution

Decision tree diagram is given below:



Evaluation

At Decision Point C: The choice is between investing ₹ 20 lacs for a perpetual benefit of ₹ 4 lacs and not to invest. The preferred choice is to invest, since the capitalized value of benefit of ₹ 4 lacs (at 10%) adjusted for the investment of ₹ 20 lacs, yields a net benefit of ₹ 20 lacs.

At Decision Point D: The choice is between investing ₹ 12 lacs, for a similar perpetual benefit of ₹ 1 lac. and not to invest. Here the invested amount is greater than capitalized value of benefit at ₹ 10 lacs. There is a negative benefit of ₹ 2 lacs. Therefore, it would not be prudent to invest.

At Outcome Point B: Evaluation of EMV is as under (₹ in lacs).

Outcome	Amount (₹)	Probability	Result (₹)
Success	20.00	0.50	10.00
Failure	0.00	0.50	00.00
Net result			10.00

EMV at B is, therefore, ₹10 lacs.

At A: Decision is to be taken based on preferences between two alternatives. The first is to test, by investing ₹ 2,40,000 and reap a benefit of ₹ 10 lacs. The second is not to test, and thereby losing the opportunity of a possible gain.

The preferred choice is, therefore, investing a sum of ₹ 2,40,000 and undertaking the test.

5. Capital Budgeting Under Capital Rationing

Generally, firms fix up maximum amount that can be invested in capital projects, during a given period of time, say a year. The firm then attempts to select a combination of investment proposals, that will be within the specific limits providing maximum profitability, and put them in descending order according to their rate of return, such a situation is then considered to be capital rationing.

A firm should accept all investment projects with positive NPV, with an objective to maximise the wealth of shareholders. However, there may be resource constraints due to which a firm may have to select from among various projects with positive NPVs. Thus there may arise a situation of capital rationing where there may be internal or external constraints on procurement of necessary funds to invest in all investment proposals with positive NPVs.

Capital rationing can be experienced due to external factors, mainly imperfections in capital markets which can be attributed to non-availability of market information, investor attitude etc. Internal capital rationing is due to the self-imposed restrictions imposed by management like not to raise additional debt or laying down a specified minimum rate of return on each project.

There are various ways of resorting to capital rationing. For instance, a firm may affect capital rationing through budgets. It may also put up a ceiling when it has been financing investment proposals only by way of retained earnings (ploughing back of profits). Since the amount of capital expenditure in that situation cannot exceed the amount of retained earnings, it is said to be an example of capital rationing.

Capital rationing may also be introduced by following the concept of 'responsibility accounting', whereby management may introduce capital rationing by authorising a particular department to make investment only upto a specified limit, beyond which the investment decisions are to be taken by higher-ups.

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

Capital Rationing can be divided into following two categories:

- (a) Hard Capital Rationing
- (b) Soft Capital Rationing

2.41 Strategic Financial Management

- (a) **Hard Capital Rationing:** Hard capital rationing is a situation related to external sources. Agencies either capital market itself or Government (may or may not act through Capital Market) will supply only limited amount of capital in spite of fact the projects with positive NPVs have been identified. This situation implies existence of imperfect capital market as in perfect capital market hard capital rationing should never be occurred.
- (b) **Soft Capital Rationing:** Soft Capital Rationing is due to internal forces such as limits imposed by management on capital expenditure. There may be many reasons for such imposition some of which are as follows:
- In order to retain control senior management may place limits.
 - Although some ambitious managers may be interested to overstate the extent of investment opportunities in their sector of responsibility. But their individual evaluation to sort out good project shall be time consuming and bureaucratic.
 - Even though the firm may be operating in a dynamic environment and have a large number of profitable expansion opportunities. However, accepting all of them may lead to difficulties in planning and control.
 - Management may be worried about the increasing risk associated with extensive borrowings and asset levels.
 - Existing owners, managers and family shareholders may not be interested in losing control by way of issuing additional equity to meet the requirement of finance.

The following illustration shows how a firm may resort to capital rationing under situation of resource constraints.

Illustration 11

Alpha Limited is considering five capital projects for the years 2012 and 2013. The company is financed by equity entirely and its cost of capital is 12%. The expected cash flows of the projects are as follows:

Year and Cash flows (₹ '000)

Project	2012	2013	2014	2015
A	(70)	35	35	20
B	(40)	(30)	45	55
C	(50)	(60)	70	80
D	–	(90)	55	65
E	(60)	20	40	50

Note : *Figures in brackets represent cash outflows.*

All projects are divisible i.e. size of investment can be reduced, if necessary in relation to availability of funds. None of the projects can be delayed or undertaken more than once.

Calculate which project Alpha Limited should undertake if the capital available for investment is limited to ₹ 1,10,000 in 2012 and with no limitation in subsequent years. For your analysis, use the following present value factors:

Year	2012	2013	2014	2015
Factor	1.00	0.89	0.80	0.71

Solution

Computation of Net Present Value (NPV) & Profitability Index (PI)

('000)

Project	Discounted Cash Flows				NPV	PI
	2012	2013	2014	2015		
A	(70)	31.15	28	14.20	3.35	1.048
B	(40)	(26.70)	36	39.05	8.35	1.209
C	(50)	(53.40)	56	56.80	9.40	1.188
D	–	(80.10)	44	46.15	10.05	1.125
E	(60)	17.80	32	35.50	25.30	1.422

Ranking of Projects in descending order of NPV

Rank	1	2	3	4	5
Projects	E	D	C	B	A

Selection and Analysis: For Project 'D' there is no capital rationing but it satisfies the criterion of required rate of return. Hence Project D may be undertaken.

For other projects the requirement is ₹ 2,20,000 in year 2012 whereas the capital available for investment is only ₹ 1,10,000. Based on the ranking, the final selection from other projects which will yield maximum NPV will be:

Project and Rank	Amount of Initial Investment
	₹
E (1)	60,000
C (2)	50,000

Ranking of Projects excluding 'D' which is to start in 2013 when there is no limitation on capital availability :

Projects	E	B	C	A
Rank	1	2	3	4

2.43 Strategic Financial Management

Working Notes:

Computation of Discounted Cash flows

(₹ '000)

Year	2012	2013	2014	2015
Present value factor	1.00	0.89	0.80	0.71
Project				
A Cash flows	(70)	35	35	20
Discounted cash flows	(70)	31.15	28	14.20
B Cash flows	(40)	(30)	45	55
Discounted cash flows	(40)	(26.70)	36	39.05
C Cash flows	(50)	(60)	70	80
Discounted cash flows	(50)	(53.40)	56	56.80
D Cash flows	–	(90)	55	65
Discounted cash flows	–	(80.10)	44	46.15
E Cash flows	(60)	20	40	50
Discounted cash flows	(60)	17.80	32	35.50

Above illustration was based on the concept that the products are divisible. It may be possible that projects may not be divisible. In such situation 'Combination Approach' should be adopted consisting of following steps:

- Find all combinations of projects, which are feasible given the capital budget restriction and project interdependencies.
- Select the feasible combination having highest NPV.

Illustration 12

A firm has capital budget constraint of ₹ 30,00,000. The expected outlay and cash flows of various projects is as follows :

Project	Outlay (₹ In lakhs)	NPV (₹ In lakhs)
A	18.0	7.5
B	15.0	6.0
C	12.0	5.0
D	7.5	3.6
E	6.0	3.0

Projects B & C mutually exclusive while other projects are interdependent.

Determine which possible combination the firm should select.

Solution

Feasible combination & their NPV is as follows

<i>Feasible Combination</i>	<i>Outlay (₹ In lakhs)</i>	<i>NPV (₹ In lakhs)</i>
A	18.0	7.5
B	15.0	6.0
C	12.0	5.0
D	7.5	3.6
E	6.0	3.0
A & C	30.0	12.5
A & D	25.5	11.1
A & E	24.0	10.5
B & D	22.5	9.6
B & E	21.0	9.0
C & D	19.5	8.6
C & E	18.0	8.0
B, D & E	28.5	12.6
C, D & E	25.5	11.6

Desirable feasible combination of projects consists of B, D & E giving highest NPV.

6. Capital Budgeting Under Inflation

Adjustment for inflation is a necessity for capital investment appraisal. This is because inflation will raise the revenues & costs of the project. The net revenues after adjustment for inflation shall be equal to net revenues in current terms. The considerations, which cause distortion, are:

(1) Depreciation charges are based on historical costs. Tax benefits accruing from depreciation charges do not keep parity with inflation.

As annual after tax cash inflow of a project is equal to

$$(R - C - D) (1 - T) + D = (R - C) (1 - T) + DT$$

Where,

R → Revenue from project

C → Costs (apart from depreciation) relating to the project

D → Depreciation charges

T → Tax Rate

Here $(R - C) (1 - T)$ tends to move in line with inflation as inflation influences revenues & costs similarly. DT does not depend on inflation as depreciation charges are based on historical costs. The effect of inflation is to reduce the actual rate of return.

2.45 Strategic Financial Management

Example:

Initial outlay of a project	– ₹ 80,000
Expected life	– 4 years
Salvage value	– Nil
Annual revenues	– ₹ 60,000
Annual costs other than depreciation	– ₹ 20,000
Tax Rate	– 50%

Depreciation on straight-line basis presuming as if there is no inflation.

Year	1	2	3	4
Revenues	₹ 60,000	₹ 60,000	₹ 60,000	₹ 60,000
Costs other than depreciation	₹ 20,000	₹ 20,000	₹ 20,000	₹ 20,000
Depreciation	₹ 20,000	₹ 20,000	₹ 20,000	₹ 20,000
Taxable profit	₹ 20,000	₹ 20,000	₹ 20,000	₹ 20,000
Tax	₹ 10,000	₹ 10,000	₹ 10,000	₹ 10,000
Profit after tax	₹ 10,000	₹ 10,000	₹ 10,000	₹ 10,000
Net cash inflow	₹ 30,000	₹ 30,000	₹ 30,000	₹ 30,000

If there is inflation @ 10% applicable to revenues & cost of project.

Year	1	2	3	4
Revenues	₹ 66,000	₹ 72,600	₹ 79,860	₹ 87,846
Costs other than depreciation	₹ 22,000	₹ 24,200	₹ 26,620	₹ 29,282
Depreciation	₹ 20,000	₹ 20,000	₹ 20,000	₹ 20,000
Taxable profit	₹ 24,000	₹ 28,400	₹ 33,240	₹ 38,564
Tax	₹ 12,000	₹ 14,200	₹ 16,620	₹ 19,282
Profit after tax	₹ 12,000	₹ 14,200	₹ 16,620	₹ 19,282
Net cash inflow	₹ 32,000	₹ 34,200	₹ 36,620	₹ 39,282

The actual net cash flow stream after deflating for inflation rate of 10% .

Real Net Cash Flow	₹ 29,091	₹ 28,264	₹ 27,513	₹ 26,830
--------------------	----------	----------	----------	----------

So actual net cash flows are less than net cash flow if there is no inflation.

(2) Costs of capital considered for investment appraisals contain a premium for anticipated inflation. Due to inflation investors require the nominal rate of return to be equal to:

Required Rate of Return in real terms plus Rate of Inflation.

Formula

$$R_N = R_R + P$$

R_N → Required rate of return in nominal terms.

R_R → Required rate of return in real terms.

P → Anticipated inflation rate.

If cost of capital (required rate of return) contains a premium for anticipated inflation, the inflation factor has to be reflected in the projected cash flows.

If there is no inflation, then it has to be discounted at required rate of return in real terms.

Illustration 13

Determine NPV of the project with the following information:

<i>Initial Outlay of project</i>	₹ 40,000
<i>Annual revenues (Without inflation)</i>	₹ 30,000
<i>Annual costs excluding depreciation (Without inflation)</i>	₹ 10,000
<i>Useful life</i>	4 years
<i>Salvage value</i>	Nil
<i>Tax Rate</i>	50%
<i>Cost of Capital (Including inflation premium of 10%)</i>	12%

Solution

Annual Cash Flow of project is

$$(\text{₹ } 30,000 - \text{₹ } 10,000) (1 - 0.50) + \text{₹ } 10,000 \times 0.50 = \text{₹ } 15,000$$

It would be inconsistent to discount these real cash flows at 12% (nominal rate of return).

There are two alternatives:

- (i) Either to restate the cash flow in nominal term and discount at 12% or
- (ii) Restate the discount rate in real terms and use this to discount the real cash flows.

NPV using (i) approach

Since inflation rate is 10% a year, real cash flows may be stated in nominal cash flows as follows:

$$\text{Nominal Cash Flow} = (1 + \text{Inflation Rate}) \text{ Real Cash Flows}$$

Year	Real Cash Flows	Nominal Cash flows
1	15000	$15,000 \times 1.10 = 16,500$
2	15,000	$15,000 \times (1.10)^2 = 18,150$
3	15,000	$15,000 \times (1.10.)^3 = 19,965$
4	15,000	$15,000 \times (1.10)^4 = 21,962$

2.47 Strategic Financial Management

NPV using nominal discounting rate 12%

$$\frac{16,500}{(1.12)} + \frac{18,150}{(1.12)^2} + \frac{19,965}{(1.12)^3} + \frac{21,962}{(1.12)^4} - 40,000$$
$$= ₹ 14,732 + ₹ 14,469 + ₹ 14,211 + ₹ 13,957 - ₹ 40,000$$
$$= ₹ 17,369 \text{ (Approx)}$$

NPV using (ii) approach

To compute NPV using (ii) approach, we shall need real discount rate, which shall be computed as follows:

$$\text{Real Discount Rate} = \frac{1 + \text{Nominal Discount Rate}}{1 + \text{Inflation Rate}} - 1$$

$$\text{Real Discount Rate} = \frac{1 + 0.12}{1 + 0.10} - 1 = 0.0182 \text{ i.e. } 1.8\%$$

$$\text{NPV} = \sum_{t=1}^n \text{cf}_t - I_0$$

Where t = Time Period
 cf_t = Annual Cash Flow
 I_0 = Initial Outlay

Accordingly NPV of the project

$$\frac{15,000}{(1.0182)} + \frac{15,000}{(1.0182)^2} + \frac{15,000}{(1.0182)^3} + \frac{15,000}{(1.0182)^4} - 40,000$$
$$= ₹ 14,732 + ₹ 14,469 + ₹ 14,210 + ₹ 13,956 - ₹ 40,000$$
$$= ₹ 57,367 - ₹ 40,000 = ₹ 17,367 \text{ (Approx)}$$

NPV based on consideration that inflation rate for revenue and cost are different shall be computed as follows:

$$\text{N.P.V.} = \sum_{t=1}^n \left[\frac{\{R_t(1+i_r) - C_t \sum_{r=1}^t (1+i_c)\} (1-T) + D_t T}{(1+k)^t} \right] - I_0$$

R_t → revenues for the year 't' with no inflation.

i_r → annual inflation rate in revenues for 'r' th year.

C_t → costs for year 't' with no inflation.

i_c → annual inflation rate of costs for year 'r'.

T → tax rate.

D_t → depreciation charge for year 't'.

$I_0 \rightarrow$ initial outlay.

$k \rightarrow$ cost of capital (with inflation premium).

Illustration 14

XYZ Ltd. requires ₹ 8,00,000 for an unit. Useful life of project - 4 years. Salvage value - Nil. Depreciation Charge ₹ 2,00,000 p.a. Expected revenues & costs (excluding depreciation) ignoring inflation.

Year	1	2	3	4
Revenues	₹ 6,00,000	₹ 7,00,000	₹ 8,00,000	₹ 8,00,000
Costs	₹ 3,00,000	₹ 4,00,000	₹ 4,00,000	₹ 4,00,000

Tax Rate 60% cost of capital 10% (including inflation premium).

Calculate NPV of the project if inflation rates for revenues & costs are as follows:

Year	Revenues	Costs
1	10%	12%
2	9%	10%
3	8%	9%
4	7%	8%

Solution

Computation of Annual Cash Flow

(i) Inflation adjusted Revenues

Year	Revenues (₹)	Revenues (Inflation Adjusted) (₹)
1	6,00,000	6,00,000(1.10) = 6,60,000
2	7,00,000	7,00,000(1.10)(1.09) = 8,39,300
3	8,00,000	8,00,000(1.10)(1.09)(1.08) = 10,35,936
4	8,00,000	8,00,000(1.10)(1.09)(1.08)(1.07) = 11,08,452

(ii) Inflation adjusted Costs

Year	Revenues (₹)	Revenues (Inflation Adjusted) (₹)
1	3,00,000	3,00,000(1.12) = 3,36,000
2	4,00,000	4,00,000(1.12)(1.10) = 4,92,800
3	4,00,000	4,00,000(1.12)(1.10)(1.09) = 5,37,172
4	4,00,000	4,00,000(1.12)(1.10)(1.09)(1.08) = 5,80,124

(iii) Tax Benefit on Depreciation = ₹ 2,00,000 x 0.60 = ₹ 1,20,000

2.49 Strategic Financial Management

(iv) Net Profit after Tax

Year	Revenues (Inflation Adjusted) (₹)(1)	Costs (Inflation Adjusted) (₹)(2)	Net Profit (₹) (3) = (1) - (2)	Tax (₹) (4) = 60% of (3)	Net after Profit (₹) (3) - (4)
1	6,60,000	3,36,000	3,24,000	1,94,400	1,29,600
2	8,39,300	4,92,800	3,46,500	2,07,900	1,38,600
3	10,35,936	5,37,172	4,98,764	2,99,258	1,99,506
4	11,08,452	5,80,124	5,28,328	3,16,997	2,11,331

(iv) Present Value of Cash Inflows

Year	Net after Profit (₹)	Tax Benefit on Depreciation (₹)	Cash Inflow (₹)	PVF@ 10%	PV (₹)
1	1,29,600	1,20,000	2,49,600	0.909	2,26,886
2	1,38,600	1,20,000	2,58,600	0.826	2,13,604
3	1,99,506	1,20,000	3,19,506	0.751	2,39,949
4	2,11,331	1,20,000	3,31,331	0.683	2,26,299
					9,06,738

$$NPV = ₹ 9,06,738 - ₹ 8,00,000 = ₹ 1,06,738$$

7. Capital Asset Pricing Model Approach to Capital Budgeting

The Capital Asset Pricing Model is based on the presumption that total risk of an investment consists of two components (1) Systematic risk (2) Unsystematic risk.

Systematic risk arises from the effect of economic factors e.g. inflation, governmental expenditure, money supply, having a bearing on the existence of every firm although the level of effect vary from firm to firm Systematic risk cannot be overcome by diversification. Unsystematic risk arises from factors which are specific to a firm e.g. development of a new process, plant breakdown, access to market, etc. It can be eliminated by diversification.

For detailed discussion please refer chapter 7 of this Study Material. Systematic risk is indicated by β any can be calculated as follows:

(i) Regression Method: This model is based on the assumption that a linear relationship exists between a dependent variable and an independent variable. The formula of regression equation is as follows:

$$ER_i = \alpha + \beta R_m$$

ER_i = Expected return security

α = Estimated return from security if market return as zero

R_m = Market Return

β = Beta of security

(ii) **Correlation Method:** As per this method, the Beta of any security can be calculated as follows:

$$\beta_j = \frac{r_{jm} \sigma_j \sigma_m}{\sigma_m^2}$$

σ_{jm} = Coefficient of co-relation between return of security and market return

σ_j = Standard Deviation of Return on investment

σ_m = Standard Deviation of Return on Market return (Market Portfolio or Index)

With the help of β of any security the expected return of any security can be calculated using Capital Asset Pricing Model (CAPM) as follows:

$$ER = R_f + \beta(R_m - R_f)$$

Where,

- ER = Expected return
- R_f = Risk free rate of return
- R_m = Market return
- β = Beta of security
- $R_m - R_f$ = Market risk premium

Thus, from above, it can be said that CAPM can be used to calculate appropriate discount taking into account the systematic risk of the project. However, this approach refers from limitations:

- ◆ CAPM is a single period model, whereas NPV is a multi period concept.
- ◆ In CAPM it is assumed that market shall remain constant which may not be possible in NPV due to its long period.

In spite of above limitations CAPM can provide on NPV discount rate, which is certainly a considerable improvement on estimation of discounting rate.

7.1. Estimating the beta of a capital project: The procedure consists of finding the regression relationship between the series of one period return on the security and the series of one period return on the market index.

While applying this procedure to determine the beta of a capital project, a problem arises. The profitability of a capital project is measured by its net present value or internal rate of return. These measures involving multi-period time frames are not compatible with the single period return calculated for the market index. Alternatives suggested are:

(a) *Calculation of Project Beta on the Project's Market Values* One-period return of a project.

$$R_{jt} = (A_{jt} + V_{jt} - V_{j,t-1}) / V_{j,t-1}$$

Where R_{jt} = return on project j for period t

A_{jt} = cash flow of project j for period t

2.51 Strategic Financial Management

V_{jt} = market value of project j at the end of period t

$V_{j,t-1}$ = market value of project j at the end of period $t - 1$

Estimating the value of the project at the end of the period is a difficult task.

- (b) *Development of Beta on the Basis of Accounting Data* An accounting measure of annual return for the project, i.e. return on assets, is regressed on an economy-wide index of returns to obtain a measure for beta. It uses data which is easily available. Studies have shown that the relationship between accounting and market beta for companies is statistically significant. But, the relationship is not strong enough to warrant the use of accounting betas as substitutes for market betas.
- (c) *Use of Beta of a Company whose Operations are not Similar to that of the Proposed Project*-We have so far assumed that the proposed project and the proxy company are similar to each other as far as their debt to equity ratio is concerned. However, the beta is actually a function of the leverage as well as the business risk. In other words, we are dealing with equity beta until now. As a company increases the proportion of debt capital in its capital structure, both its beta and the required return increase in a linear manner. Hence in case one wishes to use the CAPM as a model for valuing cost of equity in order to determine financially feasible investments, one needs to take into account the difference of leverage in the proxy company/project and the company/project whose required return is to be computed.

Mathematically

$$\beta_j = \beta_{uj} \left[1 + \frac{D}{S} (1 - T) \right]$$

where β_j & β_{uj} are the levered and unlevered betas respectively., D/S is the debt to equity ratio in market value terms and T is the corporate tax rate.

7.2. Project Selection: The relationship between risk (as measured by beta) and return is to be determined as per the capital asset pricing model. This relationship is given by the security market line.

$$R_z = R_f + \beta_z [E(R_m) - R_f]$$

where R_z = Rate of return required on project z

R_f = Risk-free rate of return

β_z = Beta of project z

$E(R_m)$ = Expected rate of return on market portfolio

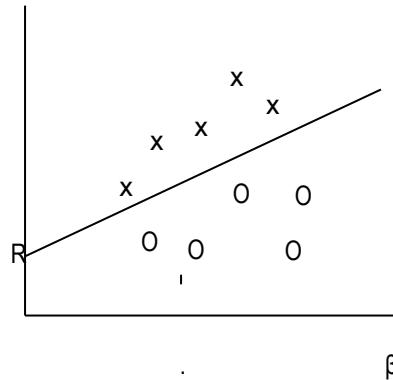
Since the beta of market portfolio, β_m , is 1, $[E(R_m) - R_f]$ may be regarded as the price per unit of risk.

Required rate of return on project z = Risk free rate of return + Risk premium

= Risk free rate of return + Level of risk for project z × Price per unit of risk

If the expected rate of return for a project exceeds its required rate of return as per the security market line relationship, the project is worthwhile. If not, the project is not worthwhile. In the diagram, projects lying above the security market line marked by X's, are acceptable and projects lying below the security market line, marked by O's, are not acceptable.

Required Rate of Return



8. Replacement Decision

Capital budgeting refers to the process we use to make decisions concerning investments in the long-term assets of the firm. The general idea is that the capital, or long-term funds, raised by the firms are used to invest in assets that will enable the firm to generate revenues several years into the future. Often the funds raised to invest in such assets are not unrestricted, or infinitely available; thus the firm must budget how these funds are invested. Among various capital budgeting decision, Replacement decision is one of the most important classifications of capital budgeting. The replacement decision can be divided into following two types of decisions:

8.1 Replacement of Existing Machine

This is a decision concerning whether an existing asset should be replaced by a newer version of the same machine or even a different type of machine that has the same functionality as the existing machine. Such replacements are generally made to maintain existing levels of operations, although profitability might change due to changes in expenses (that is, the new machine might be either more expensive or cheaper to operate than the existing machine).

Evaluation of replacement projects is slightly more complicated comparing expansion projects because an existing asset is being replaced. When identifying the cash flows for replacement projects, keep in mind that the cash flows associated with the existing (replaced) asset will no longer exist if the new asset is purchased. Therefore, we must not only determine the cash flows that the new asset will generate, but we must also determine the effect of eliminating the cash flows generated by the replaced asset. For example, if a new asset that will produce cash sales equal to ₹100,000 per year is purchased to replace an existing asset that is generating cash sales equal to ₹75,000, then the incremental, or marginal, cash flow related to sales is ₹25,000. Likewise, if the asset that is replaced can be sold for ₹350,000, then the

2.53 Strategic Financial Management

purchase price of the new asset effectively is ₹350,000 less than its invoice price. In other words, for replacement decisions, we must determine the overall net effect of purchasing a new asset to replace an existing asset—the cash flows associated with the old asset will be replaced with the cash flows associated with the new asset. Two items that you must remember to include when determining the incremental cash flows are depreciation—not because it is a cash flow, but because it affects cash flows through taxes—and taxes, both of which generally change when an older asset is replaced with a newer asset.

Therefore analysis of replacement decision follows certain steps:

Step I. Net cash outflow (assumed at current time / [Present value of cost]):

- a. (Book value of old equipment - market value of old equipment) × Tax Rate = Tax payable/savings from sale
- b. Cost of new equipment – [Tax payable/savings from sale + market value of old equipment] = Net cash outflow

Step II. Estimate change in cash flow per year, if replacement decision is implemented.

Change in cash flow = [(Change in sales ± Change in operating costs) - Change in depreciation] (1 - tax rate) + Change in depreciation

Step III. Present value of benefits = Present value of yearly cash flows + Present value of estimated salvage of new system

Step IV. Net present value = Present value of benefits - Present value of costs

Step V. Decision rule:

Accept when present value of benefits > present value of costs.

Reject when the opposite is true.

Illustration 15

A Company named Roby's cube decided to replace the existing Computer system of their organisation. Original cost of old system was ₹25,000 and it was installed 5 years ago. Current market value of old system is ₹5,000. Depreciation of the old system was charged with life of 10 years with Estimated Salvage value as Nil. Depreciation of the new system will be charged with life over 5 years. Present cost of the new system is ₹50,000. Estimated Salvage value of the new system is ₹1,000. Estimated cost savings with new system is ₹5,000 per year. Increase in sales with new system is assumed at 10% per year based on original total sales of ₹100000. Company follows straight line method of depreciation. Cost of capital of the company is 10% whereas tax rate is 30%.

Solution

Step I. Net cash outflow (assumed at current time) [Present values of cost]:

- a. (Book value of old system - market value of old system) × Tax Rate = Tax payable/savings from sale
$$= [(\text{₹}25,000 - 5 \times \text{₹}2,500) - \text{₹}5,000] \times 0.30 = \text{₹}7,500 \times 0.30$$
$$= \text{₹}2,250$$
- b. Cost of new system - [Tax payable/savings from sale + Market value of old system] =
Net cash outflow

Or, $₹50,000 - [₹2,250 + ₹5,000] = ₹42,750$

Step II. Estimated change in cash flows per year if replacement decision is implemented

Change in cash flow = [(Change in sales ± Change in operating costs)-Change in depreciation] (1-tax rate) + Change in depreciation

$$= [₹1,00,000 \times 0.1 + ₹5,000 - (₹49,000/5 - ₹25,000/10)] (1-0.30) + (₹49,000/5 - ₹25,000/10)$$

$$= ₹12,690$$

Step III. Present value of benefits = Present value of yearly cash flows + Present value of estimated salvage of new system

$$= ₹12,690 \times PVIFA (10\%, 5) + ₹1,000 \times PVIF (10\%, 5)$$

$$= ₹48,723$$

Step IV. Net present value = Present value of benefits - Present value of costs

$$= ₹48,723 - ₹42,750$$

$$= ₹5,973$$

Step V. Decision rule: Since NPV is positive we should accept the proposal to replace the machine.

8.2 Optimum Replacement Cycle

Case discussed above is a simple example replacement decision based on NPV. This decision was based on assumption that the projects do not form part of continuous replacement cycle.

However, sometimes, project may involve continuous replacement cycle. In such cases NPV decision rules needs modification. To determine optimal replacement cycle, concept of Equivalent Annual Cost (EAC), discussed at Intermediate (IPC) Level is used.

The formula to compute EAC is as follows:

$$\frac{\text{PV of Cash Outflow}}{\text{PVAF}}$$

This decision is based on assumption that as the machine (asset) becomes older its efficiency decreases and leading to increase in operating cost and reduction in resale value.

Illustration 16

X Ltd. is a taxi operator. Each taxi cost to company ₹ 4,00,000 and has a useful life of 3 years. The taxi's operating cost for each of 3 years and salvage value at the end of year is as follows:

	Year 1	Year 2	Year 3
Operating Cost	₹ 1,80,000	₹ 2,10,000	₹ 2,38,000
Resale Value	₹ 2,80,000	₹ 2,30,000	₹ 1,68,000

You are required to determine the optimal replacement period of taxi if cost of capital of X Ltd. is 10%.

2.55 Strategic Financial Management

Solution

NPV if taxi is kept for 1 Year

$$\begin{aligned} &= -4,00,000 - 1,80,000 (0.909) + 2,80,000 (0.909) \\ &= -3,09,100 \end{aligned}$$

NPV if taxi is kept for 2 Year

$$\begin{aligned} &= -4,00,000 - 1,80,000 \times 0.909 + 20,000 \times 0.826 \\ &= -5,47,100 \end{aligned}$$

NPV if taxi is kept for 3 Year

$$\begin{aligned} &= -4,00,000 - 1,80,000 \times 0.909 - 2,10,000 \times 0.826 - 70,000 \times 0.751 \\ &= -7,89,650 \end{aligned}$$

Since above NPV figures relate to different periods, there are not comparable. to make them comparable we shall use concept of EAC as follows:

EAC of 1 year

$$\frac{3,09,100}{0.909} = 3,40,044$$

EAC of 2 year

$$\frac{5,47,100}{1.735} = 3,15,331$$

EAC of 3 year

$$\frac{7,89,650}{2.486} = 3,17,639$$

Since lowest EAC incur if taxi for 2 year; Hence the optimum replacement cycle to replace taxi in 2 years.

9. Real Option in Capital Budgeting

The traditional analytical methods project evaluation (IRR, NPV, etc.) assume management's passive commitment to a certain "operating strategy" - viz., initiate the project immediately and operate it continuously at a set scale until the end of its pre-specified expected useful life. These methods typically ignore the synergistic effects that an investment project can create. Sometimes the performance of one project will allow you to perform a second project that would not have been possible without the first (e.g., many research and development projects). Similarly, there could be significant value in waiting for additional information that could make an impact on the success of a project. Therefore, the existing analytical methods usually underestimate investment opportunities because they ignore management's flexibility to alter decisions as new information becomes available.

Therefore, Real Options methodology is an approach to capital budgeting that relies on Option Pricing theory to evaluate projects. Insights from option based analysis can improve estimates

of project value and, therefore, has potential, in many instances to significantly enhance project management. However, Real options approach is intended to supplement, and not replace, capital budgeting analyses based on standard DCF methodologies.

Options in Capital Budgeting

The following is a list of options that may exist in a capital budgeting project.

Long call:

- Right to invest at some future date, at a certain price
- Generally, any flexibility to invest, to enter a business, to expand a business

Long put:

- Right to sell at some future date at a certain price
- Right to abandon at some future date at zero or some certain price
- Generally, any flexibility to disinvest, to exit from a business.

Short call:

- Promise to sell if the counterparty wants to buy
- Generally, any commitment to disinvest upon the action of another party

Short put:

- Promise to buy if the counterparty wants to sell
- Generally, any commitment to invest upon the action of another party

Valuation of Real Options

The methods employed to valuation of real options are same as used in valuation of Financial Options. However, sometimes it becomes difficult to identify the value of certain inputs. The various type of cash flows associated with Real Option can be analysed with cash flows involved in Financial options and method used in financial options can be employed easily. For example cost of an expansion decision is the exercise price or premium in financial option.

Broadly, following methods are employed in Valuation of Financial Options.

- (a) Binomial Model
- (b) Risk Neutral Method
- (c) Black-Scholes Model

Type of Real Options

Following are broad type of Real Options

(a) Growth Options: Sometimes it may be possible that some projects have a negative or insignificant even the managers may be interested in accepting the project as it may enable companies to find considerable profitability and add values in future. Some of the examples of such options are as follows:

2.57 Strategic Financial Management

- Investment in R&D activities
- Heavy expenditure on advertisement
- Initial investment in foreign market to expand business in future
- Acquiring making rights
- Acquisition of vacant plot with an intention to develop it in future.

The purposes of making such investments are as follows:

- Defining the competitive position of firm hence it is called strategic investments.
- Gaining knowledge about project's from profitability.
- Providing the manufacturing and making flexibility to the firm.

(b) Abandonment Option

As we have already studied in Capital Budgeting (at IPCC level) that once funds have been committed in any Capital Budgeting project it can not be recorded without incurring a heavy loss. However, in some cases due to change in economic conditions the firm may like to opt for abandoning the project without incurring further huge loses.

The option to abandon the project is similar to a Put Option where option to a abandon the project shall be exercised if value derived from project's assets is more than PV of continuing project for one or more period.

Illustration 17

IPL already in production of Fertilizer is considering a proposal of building a new plant to produce pesticides. Suppose, the NPV of proposal is ₹ 200 crore without abandonment option and if market conditions for pesticide turns out to be favourable the NPV of proposal shall increase by 30% and on the other hand market conditions remain sluggish the NPV of the proposal shall be reduced by 40%. In case company is not interested in continuation of the project it can be disposed off for ₹ 160 crore.

If the risk-free rate of interest is 12% determine the value of abandonment option.

Solution

Decision Tree showing pay off

Year 0	Year 1	Pay off
200	260	0*
	120	160-120 = 40

* Since by continuing the project the company will lose the value of exercising the option.

First of all we shall calculate probability of high demand (P) using risk neutral method as follows:

$$12\% = p \times 30\% + (1-p) \times (-40\%)$$

$$0.12 = 0.30 p - 0.40 + 0.40p$$

$$p = \frac{0.52}{0.70} = 0.743$$

The value of abandonment option will be as follows:

Expected Payoff at Year 1

$$\begin{aligned} &= p \times 0 + [(1-p) \times 40] \\ &= 0.743 \times 0 + [0.257 \times 40] \\ &= ₹ 10.28 \text{ crore} \end{aligned}$$

Since expected pay off at year 1 is 10.28 crore. Present value of expected pay off will be:

$$\frac{10.28}{1.12} = 9.18 \text{ crore.}$$

This is the value of Abandonment Option (Put Option).

(c) Timing Option: In traditional capital budgeting the project can either be accepted or rejected, implying that this will be undertaken or forever not. However, in real life situation a sometime a third choice also arises i.e. delay the decision until later, in i.e. option when to invest. Possible reasons for this delay may be availability of better information or ideas later on. This case of real option is similar to American call option and generally Binomial Model or Risk Material Method is option pricing are used in such situations.

The Real Options approach to projects appraisal uses the similarity of projects to financial options which are traded in secondary markets. However, we must take care to note the following differences between real options and financial options:-

- (a) Financial options have an underlying asset that is traded - usually a security like a stock. A real option has an underlying asset that is not a security - for example a project or a growth opportunity, and it isn't traded.
- (b) The payoffs for financial options are specified in the contract. Real options are "found" or created inside of projects. Their payoffs can be varied.
- (c) Typically, the exercise period of real options are far, far higher than that of financial options Financial options are "priced"
- (d) And finally, Real options are "valued" whereas financial options are "priced".

Leasing Decisions

Learning Objectives

After going through the chapter student shall be able to understand.

- Meaning, types, advantages and disadvantages of Leasing.
- Financial evaluation of lease proposal from Lessee and Lessor Perspective
- Break Even Lease Rental (BELR) from Lessee's and Lessor's point of view
- Cross Border Leasing

1. Leasing

1.1 What is lease: Lease can be defined as a right to use an equipment or capital goods on payment of periodical amount. This may broadly be equated to an instalment credit being extended to the person using the asset by the owner of capital goods with small variation.

1.2 Parties to a Lease Agreement: There are two principal parties to any lease transaction as under:

Lessor : Who is actual owner of equipment permitting use to the other party on payment of periodical amount.

Lessee : Who acquires the right to use the equipment on payment of periodical amount.

1.3 Lease vis-à-vis Hire Purchase: Hire-purchase transaction is also almost similar to a lease transaction with the basic difference that the person using the asset on hire-purchase basis is the owner of the asset and full title is transferred to him after he has paid the agreed installments. The asset will be shown in his balance sheet and he can claim depreciation and other allowances on the asset for computation of tax during the currency of hire-purchase agreement and thereafter.

In a lease transaction, however, the ownership of the equipment always vests with the lessor and lessee only gets the right to use the asset. Depreciation and other allowances on the asset will be claimed by the lessor and the asset will also be shown in the balance sheet of the lessor. The lease money paid by the lessee can be charged to his Profit and Loss Account. However, the asset as such will not appear in the balance sheet of the lessee. Such asset for the lessee is, therefore, called off the balance sheet asset.

2. Types of Leasing

A lease transaction has many variants relating to the type and nature of leased equipment, amortisation period, residual value of equipment, period of leasing, option for termination of lease etc. Various types of leasing transactions are, therefore, operating in the market on the basis of these variants. The different leasing options may however, be grouped in following categories as under:

(a) Operating Lease : In this type of lease transaction, the primary lease period is short and the lessor would not be able to realize the full cost of the equipment and other incidental charges thereon during the initial lease period. Besides the cost of machinery, the lessor also bears insurance, maintenance and repair costs etc. The lessee acquires the right to use the asset for a short duration. Agreements of operating lease generally provide for an option to the lessee/lessor to terminate the lease after due notice. These agreements may generally be preferred by the lessee in the following circumstances:

- When the long-term suitability of asset is uncertain.
- When the asset is subject to rapid obsolescence.
- When the asset is required for immediate use to tide over a temporary problem.

Computers and other office equipments are the very common assets which form subject matter of many operating lease agreements.

(b) Financial Lease: As against the temporary nature of an operating lease agreement, financial lease agreement is a long-term arrangement, which is irrevocable during the primary lease period which is generally the full economic life of the leased asset. Under this arrangement lessor is assured to realize the cost of purchasing the leased asset, cost of financing it and other administrative expenses as well as his profit by way of lease rent during the initial (primary) period of leasing itself. Financial lease involves transferring almost all the risks incidental to ownership and benefits arising therefrom except the legal title to the lessee against his irrevocable undertaking to make unconditional payments to the lessor as per agreed schedule. This is a closed end arrangement with no option to lessee to terminate the lease agreement subsequently. In such lease, the lessee has to bear insurance, maintenance and other related costs. The choice of asset and its supplier is generally left to the lessee in such transactions. The variants under financial lease are as under:

- Lease with purchase option-where the lessee has the right to purchase the leased assets after the expiry of initial lease period at an agreed price.
- Lease with lessee having residual benefits-where the lessee has the right to share the sale proceeds of the asset after expiry of initial lease period and/or to renew the lease agreement at a lower rental.

In a few cases of financial lease, the lessor may not be a single individual but a group of equity participants and the group borrows a large amount from financial institutions to purchase the leased asset. Such transaction is called 'Leveraged lease'.

3.3 Strategic Financial Management

(c) Sales and Lease Back Leasing: Under this arrangement an asset which already exists and is used by the lessee is first sold to the lessor for consideration in cash. The same asset is then acquired for use under financial lease agreement from the lessor. This is a method of raising funds immediately required by lessee for working capital or other purposes. The lessee continues to make economic use of assets against payment of lease rentals while ownership vests with the lessor.

(d) Sales-Aid-Lease: When the leasing company (lessor) enters into an arrangement with the seller, usually manufacturer of equipment, to market the latter's product through its own leasing operations, it is called a 'sales-aid-lease'. The leasing company usually gets a commission on such sales from the manufacturers and increases its profit.

Apart from term loan and other facilities available from financial institutions including banks to a promoter to acquire equipment and other capital goods, the promoter now has an alternative option to acquire economic use of capital assets through leasing. The ultimate decision to either approach a financial institution or a leasing company will, however, depend on the nature of each such transaction.

3. Advantages

- The first and foremost advantage of a lease agreement is its flexibility. The leasing company in most of the cases would be prepared to modify the arrangement to suit the specific requirements of the lessee. The ownership of the leased equipment gives them added confidence to enable them to be more accommodative than the banks and other financial institutions.
- The leasing company may finance 100% cost of the equipment without insisting for any initial disbursement by the lessee, whereas 100% finance is generally never allowed by banks/financial institutions.
- Banks/financial institutions may involve lengthy appraisal and impose stringent terms and conditions to the sanctioned loan. The process is time consuming. In contrast leasing companies may arrange for immediate purchase of equipment on mutually agreeable terms.
- Lengthy and time consuming documentation procedure is involved for term loans by banks/institutions. The lease agreement is very simple in comparison.
- In short-term lease (operating lease) the lessee is safeguarded against the risk of obsolescence. It is also an ideal method to acquire use of an asset required for a temporary period.
- The use of leased assets does not affect the borrowing capacity of the lessee as lease payment may not require normal lines of credit and are payable from income during the operating period. This neither affects the debt equity ratio or the current ratio of the lessee.
- Leased equipment is an 'off the balance sheet' asset being economically used by the lessee and does not affect the debt position of lessee.

- By employing 'sale and lease back' arrangement, the lessee may overcome a financial crisis by immediately arranging cash resources for some emergent application or for working capital.
- Piecemeal financing of small equipments is conveniently possible through lease arrangement only as debt financing for such items is impracticable.
- Tax benefits may also sometimes accrue to the lessee depending upon his tax status.

4. Disadvantages

- the lease rentals become payable soon after the acquisition of assets and no moratorium period is permissible as in case of term loans from financial institutions. The lease arrangement may, therefore, not be suitable for setting up of the new projects as it would entail cash outflows even before the project comes into operation.
- The leased assets are purchased by the lessor who is the owner of equipment. The seller's warranties for satisfactory operation of the leased assets may sometimes not be available to lessee.
- Lessor generally obtain credit facilities from banks etc. to purchase the leased equipment which are subject to hypothecation charge in favour of the bank. Default in payment by the lessor may sometimes result in seizure of assets by banks causing loss to the lessee.
- Lease financing has a very high cost of interest as compared to interest charged on term loans by financial institutions/banks.

Despite all these disadvantages, the flexibility and simplicity offered by lease finance is bound to make it popular. Lease operations will find increasing use in the near future.

5. Evaluation of Lease

The most important part in lease financing is its evaluation both from the point of view of Lessee and Lessor.

5.1 Lessee Perspective

A lease can be evaluated either as an investment decision or as a financing means. If an investment decision has already been made, a firm (lessee) has to evaluate whether it will purchase the asset equipment or acquire it on lease basis. The lease rentals can be taken as interest on debt. Thus, leasing in essence is alternating source of financing to borrowing. *The lease evaluation thus is debt financing versus lease financing.*

There are three methods of evaluating a leasing proposal viz. Present Value analysis, Internal Rate of Return analysis, and the Bower Herringer Williamson method. These three methods are explained below with the help of an example.

Example

A leasing company expects a minimum yield of 10 % on its investment in the leasing business. It proposes to lease a machine costing ₹ 5,00,000 for ten years. Lease payments will be received in advance.

3.5 Strategic Financial Management

Evaluate the proposal of acquisition of machine from lessor's view point either by borrowing and buying or leasing assuming (a) borrowing rate of 16% (b) the income tax rate 50% (c) the operating costs are the same under lease and 'buy' alternatives (d) depreciation is allowable on straight line basis (e) residual value is 'nil'.

First we determine the Lease Rental to be charged by the Lessor Company:

The lease rental can be determined from the following equation:

$$₹ 5,00,000 = x + \frac{x}{(1+0.1)} + \frac{x}{(1+0.1)^2} \dots\dots\dots \frac{x}{(1+0.1)^9}$$

where x = lease rental per annum

$$₹ 5,00,000 = x + 5.759x$$

$$x = \frac{₹ 5,00,000}{6.759} = ₹ 73,976$$

The above solution gives us the present value of one lease rental payment at time 0, plus the present value of nine lease rental payments at the end of each of the next nine years. We can find the present value discount factor for an even stream of cash flows for nine years to the capital recovery factor in D.C.F. analysis, where we recover principal and interest in equal installment during the specified period.

Now we analyze the decision of the Lessee company by following three approaches as follows:

5.1.1 Present Value Analysis (Net Advantage of Leasing): In this method, the present value of the annual lease payments (tax adjusted) is compared with that of the annual loan repayments adjusted for tax shield on depreciation and interest, and the alternative which has the lesser cash outflow will be chosen.

Otherwise we can also define it as Net Advantage of Leasing (NAL) as follows:

$$NAL = PV \text{ of Cost of Owning} - PV \text{ of Leasing}$$

If NAL is positive, we should opt for leasing otherwise borrowing and buying option.

The discounting rate is the after-tax cost of borrowing i.e. 8% in our example.

Table 1 : Schedule of cash outflows : Leasing alternative

End of year	Lease payment ₹	Tax shield cash outflows ₹	After tax of cash outflows ₹	Present value at 8% ₹
0	73,976	—	73,976	73,976
1-9	73,976	36,988	36,988	2,31,064
10	—	36,988	(36,988)	<u>(17,125)</u>
				<u>2,87,915</u>

Table 2 : Schedule of debt repayments

The loan amount is repayable together with the interest at the rate of 16% on loan amount and is repayable in equal installments at the end of each year. The PVAF at the rate of 16% for 0-9* years is 5.6065, say 5.61 the amount payable will be

$$\text{Annual Payment} = \frac{\text{₹ } 5,00,000}{5.61} = \text{₹ } 89,127 \text{ (rounded)}$$

* It is assumed that this loan will be repaid with interest in the same period as the term of the lease. This assumption places the loan on an equivalent basis with the lease.

<i>End of year</i>	<i>Interest plus principal payment</i> ₹	<i>Principal amount owing at the end of year</i> ₹	<i>Annual Interest @16%</i> ₹	<i>Principal component</i> ₹
0	89,127	4,10,873	–	89,127
1	89,127	3,87,486	65,740	23,387
2	89,127	3,60,357	61,998	27,129
3	89,127	3,28,887	57,657	31,470
4	89,127	2,92,382	52,622	36,505
5	89,127	2,50,036	46,781	42,346
6	89,127	2,00,915	40,006	49,121
7	89,127	1,43,934	32,146	56,981
8	89,127	77,836	23,029	66,098
9	90,290*	–	<u>12,454</u>	<u>77,836</u>
			<u>3,92,433</u>	<u>5,00,000</u>

*Difference in the last installment is due to rounding off of annuity factor to two decimal points.

Table 3 : Schedule of cash outflows in debt financing

<i>End of year</i>	<i>Annual loan repayment at 8%</i>	<i>Interest @16%</i>	<i>Depre- ciation</i>	<i>Tax shield</i>	<i>Net cash outflows</i>	<i>Present value of cash flows</i>
	(1)	(2)	(3)	(4)	(5)	(6)
				[(2) + (3) × t]	(1) – (4)	
	₹	₹	₹	₹	₹	₹
0	89,127	–	–	–	89,127	89,127
1	89,127	65,740	50,000	57,870	31,257	28,944
2	89,127	61,998	50,000	55,999	33,128	28,391

3.7 Strategic Financial Management

3	89,127	57,657	50,000	53,829	35,298	28,027
4	89,127	52,622	50,000	51,311	37,816	27,795
5	89,127	46,781	50,000	48,391	40,736	27,741
6	89,127	40,006	50,000	45,003	44,124	27,798
7	89,127	32,146	50,000	41,073	48,054	28,015
8	89,127	23,029	50,000	36,515	52,612	28,410
9	90,290	12,454	50,000	31,227	59,063	29,532
10	–	–	50,000	25,000	(25,000)	<u>(11,575)</u>
(t = tax rate)						<u>3,32,205</u>

The present value of cash outflows under lease financing is ₹ 2,87,915 while that of debt financing (i.e., owning this asset) is ₹ 3,32,205. Thus, leasing has an advantage over ownership in this case.

Or

$$\text{NAL} = ₹ 3,32,205 - ₹ 2,87,915 = ₹ 44,290$$

Since NAL is positive leasing is preferable.

5.1.2 Internal rate of return analysis: Under this method there is no need to assume any rate of discount. To this extent, this is different from the former method where the after-tax cost of borrowed capital was used as the rate of discount. The result of this analysis is the after-tax cost of capital explicit in the lease which can be compared with that of the other available sources of finance such as a fresh issue of equity capital, retained earnings or debt. Simply stated, this method seeks to establish the rate at which the lease rentals, net of tax shield on depreciation are equal to the cost of leasing. For the above example, the calculation of this rate i.e. cost of leasing is shown below:

Table 4 : Computation of cash flows for internal rate of return

<i>End of year</i>	<i>Cost of asset</i>	<i>Lease rental</i>	<i>Depreciation</i>	<i>Additional tax shield on lease rental</i>	<i>Net cash outflow</i>
(1)	(2)	(3)	(4)	(5) *	(6) = [(3)–(5)]
	₹	₹	₹	₹	₹
0	5,00,000	73,976	–	–	4,26,024
1	–	73,976	50,000	11,988	(61,988)
2	–	73,976	50,000	11,988	(61,988)
3	–	73,976	50,000	11,988	(61,988)
4	–	73,976	50,000	11,988	(61,988)
5	–	73,976	50,000	11,988	(61,988)

6	–	73,976	50,000	11,988	(61,988)
7	–	73,976	50,000	11,988	(61,988)
8	–	73,976	50,000	11,988	(61,988)
9	–	73,976	50,000	11,988	(61,988)
10	–		50,000	11,988	11,988

t = tax rate at 50%

$$*[(3) - (4)] \times t$$

In the above table, the last column shows the cash flow stream. When we compute the rate of discount that equates the negative cash flows with the positive cash flows, we get, 5.4% (As shown below). This should be compared with the after-tax cost of debt finance i.e. 8%. Since the cost of lease is lower than after tax cost of debt finance, the former should be preferred.

Let us discount cash flows at 5%, then NPV is

$$\begin{aligned} & ₹ 4,26,024 + (₹ 61,988) \times \text{PVIFA}(5\%, 9) + ₹ 11,988 \times \text{PVF}(5\%, 10) \\ &= ₹ 4,26,024 + (₹ 61,988) \times 7.108 + ₹ 11,988 \times 0.614 \\ &= ₹ 4,26,024 + (₹ 4,40,611) + ₹ 7,361 = - ₹ 7,226 \end{aligned}$$

Since the value is negative now we shall discount at higher rate say at 6%.

$$\begin{aligned} &= ₹ 4,26,024 + (₹ 61,988) \times 6.802 + ₹ 11,988 \times 0.558 \\ &= ₹ 4,26,024 + (₹ 4,21,642) + ₹ 6,689 = ₹ 11,071 \end{aligned}$$

Using interpolation formula

$$= 5\% + \frac{-7226}{-7226 - 11071}(6\% - 5\%) = 5\% + \frac{7226}{18297} = 5\% + 0.395\% = 5.395\% \text{ say } 5.4\%$$

It will be noticed that there is no need to assume any cost of capital for discounting purposes in the IRR method unlike the Present value method. The management understands the IRR better than it does the Present Value. It is, therefore, considered that the IRR method may be preferred to the other methods.

5.1.3 Bower-Herringer-Williamson Method: This method segregates the financial and tax aspects of lease financing. If the operating advantage of a lease is more than its financial disadvantage or vice-versa lease will be preferred.

The procedure of evaluation is briefly as follows:

1. Compare the present value of debt with the discounted value of lease payments (gross), the rate of discount being the gross cost of debt capital. The net present value is the financial advantage (or disadvantage).
2. Work out the comparative tax benefit during the period and discount it at an appropriate cost of capital. The present value is the operating advantage (or disadvantage) of leasing.

3.9 Strategic Financial Management

3. If the net result is an advantage, select leasing.

For the given example:

	₹
Present value of loan payments	5,00,000
Present value of lease payments discounted at 16% i.e. ₹ 73,976 × 5.61 (1 + 4.61)	4,15,005
Financial advantage	84,995

The present value of comparative tax-benefits i.e., the operating advantage (disadvantage) is calculated below:

Table 5 : Operating advantage (disadvantage) of lease

<i>End of year</i>	<i>Tax shield, on leasing</i>	<i>Tax shield on borrowings</i>	<i>Incremental saving in tax due to leasing</i>	<i>Present value factor at 15%</i>	<i>Present value at 15%</i>
(1)	(2)	(3)	(4) = (2)–(3)	(5)	(6)
	₹	₹	₹		₹
1	36,988	57,870	(20,882)	0.87	(18,167)
2	36,988	55,999	(19,011)	0.76	(14,448)
3	36,988	53,829	(16,841)	0.66	(11,115)
4	36,988	51,311	(14,323)	0.57	(8,164)
5	36,988	48,391	(11,403)	0.50	(5,702)
6	36,988	45,003	(8,015)	0.43	(3,446)
7	36,988	41,073	(4,085)	0.38	(1,552)
8	36,988	36,515	473	0.33	156
9	36,988	31,227	5,761	0.28	1,613
10	36,988	25,000	11,988	0.25	<u>2,997</u>
			Operating disadvantage		<u>(57,828)</u>

Note : The rate of 15% is considered to be the appropriate cost of capital.

Since the financial advantage exceeds the operating disadvantage in lease, it is advantageous to go for leasing.

5.1.4 Selection of Discount Rate: While examining the proposals of Lease Vs. Borrowing and Buying the selection of discounting rate for discounting is an issue. Related cash flows can be discounted both at the rate of Post Tax Cost of Debt and Cost of Capital and final decision will be same. However, since leasing is substitute for borrowing option, post-tax cost of debt is a good option for discounting.

5.2 Lessor Perspective: The leasing evaluation from view point of Lessor is in fact is a Capital Budgeting Decision involving financing of asset out of the funds acquired from various sources involving some costs.

Accordingly, Lessor would like to invest only if it has positive return. In other words, the Lessor would be ready for the financing proposal if the return from it is more than cost of funds involved.

Like traditional capital budgeting decision, the Lessor can accept the proposal of financing on the following methods of evaluation:

(i) Net Present Value (NPV) Method: The Lessor would accept the proposal of financing the asset if NPV of the same is zero or more. If it negative, then it would be accepted as I would not be beneficial to accept the proposal.

(ii) Internal Rate of Return (IRR) Method: In terms of IRR Method the financing proposal should be accepted only if computed IRR of cash flows is more than the required cut-off rate or Cost of Capital or Weighted Average Cost of Capital (WACC).

Like Capital Budgeting Decision the various types of Cash flows involved in financing decisions are as follows:

(a) Initial Cash Outflow: Like in Capital Budgeting decision the initial cash outflow in financing proposal involves the Purchase Price of Machine and incidental expenses thereto.

(b) Annual Cash Flows: The Annual Cash Flow shall be accrued in the form of Annual Lease Rental adjusted in light of tax benefits on Depreciation and tax liability. Accordingly, it can be computed as follows:

$$= (\text{Lease Rental} - \text{Depreciation}) \times (1 - t) + \text{Depreciation}$$

(c) Terminal Cash Flows: Just like in the terminal year of a project in financing proposal the terminal cash flow involved is disposal/ salvage value of the asset financed net of Tax Adjustment on Short Term Capital Loss or Gain, if any.

6. Break Even Lease Rental (BELR)

Break-Even Lease Rental can be from both point of views i.e. from lessee's view as well as lessor's point of view.

6.1 Break Even Lease Rental (BELR) from Lessee's point of view : From the point of view of lessee the BELR is the rental at which the lessee is indifferent between borrowing and buying option and lease financing option. In other words, he can opt for any one option. At this rental the Net Advantage of Leasing (NAL) will be zero. It can also be defined as maximum lease rental the lessee would be willing to pay.

3.11 Strategic Financial Management

6.2 Break Even Lease Rental (BELR) from Lessor's point of View: From the lessor's view point, BELR is the minimum (floor) lease rental, which he should accept. In this case also NAL should be zero. Any lease rent below BELR should not be accepted. It is to be noted that while computing NAL, the over all cost of capital of the firm should be used. The computation of BELR from lessor's point of view can be understood with the help of following illustration.

Illustration

With the following data available compute, the BELR that ABC Ltd. should charge from lessee.

Cost of Machine	₹ 150 Lakh
Expected Useful Life	5 year
Salvage Value of Machine at the end of 5 years	₹ 10 lakh
Rate of Depreciation (WDV)	25%
K_0	14%
Applicable Tax Rate	35%

Machine will constitute a separate block for depreciation purpose.

Solution

Cost of Machine	₹ 150,00,000
Less: - PV of Salvage Value (W1)	₹ 5,19,400
Less: PV of Tax benefit on Depreciation (W2)	₹ 27,34,184
Less: PV of Tax Saving on STCL at the end of 5 year (W3)	₹ 6,80,478
	<u>₹ 110,65,938</u>
PVIFA for 5 years @14%	3.433

$$\text{After tax Break Even Lease Rental} = \frac{1,10,65,938}{3.433} = 32,23,400$$

$$\text{Before Tax BELR} = \frac{32,23,400}{(1-0.35)} = ₹ 49,59,100$$

Working Notes

W1

Salvage Value	=	₹ 10,00,000
PVF @14%	=	0.5194
PV of Salvage Value	=	₹ 5,19,400

W2

Table showing calculation of PV of Tax Benefit on Depreciation

Year	Opening WDV	Depreciation @ 25%	Closing WDV	PVF @14%	PV
	(₹)	(₹)	(₹)		(₹)
1	150,00,000	37,50,000	11,250,000	0.877	32,88,750
2	112,50,000	28,12,500	84,37,500	0.769	21,62,813
3	84,37,500	21,09,375	63,28,125	0.675	14,23,828
4	63,28,125	15,82,031	47,46,094	0.592	9,36,562
					<u>78,11,953</u>

Tax Benefit on Depreciation = ₹ 78,11,953 X 0.35 = ₹ 27,34,184

W3

PV of Tax benefit on Short Term Capital Loss (STCL)

WDV at beginning of 5 year as per above table	47,46,094
Less: Salvage Value	<u>10,00,000</u>
STCL	<u>37,46,094</u>
Tax Benefit	13,11,133
PVF at 14%	0.519
PV of Tax Benefit on STCL	6,80,478

7. Cross-Border Leasing

Cross-border leasing can be considered as an alternative to equipment loans in some emerging foreign market, where finance leases are treated as conditional sales agreements. The only difference between international leasing and loans will be the documentation, with down payments, payment streams, and lease-end options the same as offered under **Equipment Loans to Foreign Buyers**. The various kinds of leasing arrangements available in the U.S. market are not yet feasible in most cases for cross-border leasing transactions. There are however, attempts to develop more flexible international leasing structures for export financing. Operating leases may be feasible for exports of large equipment with a long economic life relative to the lease term.

Cross-border leasing is a leasing arrangement where lessor and lessee are situated in two different countries. This raises significant additional issues relating to tax avoidance and tax shelters.

Cross-border leasing has been widely used in some European countries, to arbitrage the difference in the tax laws of different countries. Typically, this rests on the premise that, for tax purposes, some assign ownership and the attendant depreciation allowances to the entity that has legal title to an asset, while others assign it to the entity that has the most of the use (legal title being only one of several factors taken into account). In these cases, with

3.13 Strategic Financial Management

sufficiently long leases (often 99 years), an asset can end up with two effective owners, one each in different countries, this is often referred to as a double-dip lease.

Often the original owner of an asset is not subject to taxation in any country and therefore not able to claim depreciation. The transaction often involves an entity selling an asset (such as sewerage system or power plant) to an investor (who can claim depreciation), and long-term leasing it right back (often referred to as a sale leaseback).

Leasing techniques had been used for financing purposes for several decades throughout the world. The practice was developed as a method of financing aircraft. Several airlines entities in the early 1970s were unprofitable and very capital intensive. These airlines had no need for the depreciation deductions generated by their aircraft and were significantly more interested in reducing their operating expenses. A very prominent bank purchased aircraft and leased them to the airlines and because the bank was able to claim depreciation deductions for those aircraft, the bank was able to offer lease rates that were significantly lower than the interest payments that airlines would have to pay on an aircraft purchase loan (and most commercial aircraft flying today are operated under a lease). In the United States, this spread into leasing the assets of U.S. entities and governmental entities and eventually evolved into cross-border leasing.

One significant evolution of the leasing industry involved the collateralization of lease obligations in sale leaseback transactions. For example, an entity would sell an asset to a bank, the bank would require lease payment and give an entity an option to repurchase the asset, the lease obligations were low enough (due to the depreciation deductions the banks were now claiming) so that the entity could pay for the lease obligations and fund the repurchase of the asset by depositing most but not all of the sale proceeds in an interest bearing account. This resulted in the entity having pre-funded all of its lease obligations as well as its option to repurchase the asset from the bank for less than the amount received in the initial sale of the asset so the entity would be left with additional cash after having pre-funded all of its lease obligations.

This gave the appearance of entities entering into leasing transactions with banks for a fee. By the late 1990s many of such leasing transactions were with entities in Europe. However, in 1999 cross border leasing in the United States was “stopped” by the effective shutdown of LILOs (lease-in/lease outs). LILOs were significantly more complicated than the typical lease where an owner (for example) would lease an asset to a bank and then lease it back from the bank for a shorter period of time.

Cross-border leasing has been in practice as a means of financing infrastructure development in emerging nations. Cross-border leasing may have significant applications in financing infrastructure development in emerging nations – such as rail and air transport equipment, telephone and telecommunications equipment and assets incorporated into power generation and distribution systems and other projects that have predictable revenue streams.

A major objective of cross-border leases is to reduce the overall cost of financing through utilization by the lessor of tax depreciation allowances to reduce its taxable income. The tax savings are passed through to the lessee as a lower cost of finance. The basic prerequisites are relatively high tax rates in the lessor's country liberal depreciation rules and either very flexible or very formalistic rules governing tax ownership.

Other important objectives of cross border leasing include the following:

- The lessor is often able to utilize nonrecourse debt to finance a substantial portion of the equipment cost. The debt is secured by among other things, a mortgage on the equipment and by an assignment of the right to receive payments under the lease.
- Also, depending on the structure, in some countries the lessor can utilize very favourable "leveraged lease" financial accounting treatment for the overall transaction.
- In some countries, it is easier for a lessor to repossess the leased equipment following a lessee default because the lessor is an owner and not a mere secured lender.
- Leasing provides the lessee with 100% financing.

While details may differ from one transaction to another, most leasing structures are essentially similar and follow the "sale-leaseback" pattern. The principal players are (i) one or more equity investors; (ii) a special purpose vehicle formed to acquire and own the equipment and act as the lessor; (iii) one or more lenders, and (iv) the lessee. The lease itself is a "triple-net lease" under which the lessee is responsible for all costs of operation, maintenance and insurance.

In many transactions, the lessee's fixed payment obligations are prefunded or "defeased" through an up-front payment (in an amount equal to the present value of the fixed payment obligations) to a financial entity that assumes such obligations. The benefits of defeasance include (i) the lessee can lock in its financial savings by making the defeasance payment; (ii) by routing the lease payments through the defeasance entity's jurisdiction, withholding taxes applicable to lease payments in the lessee's jurisdiction may possibly be avoided; (iii) defeasance serves to some extent as a credit enhancement technique for the lessor, and (iv) defeasance may eliminate or reduce currency risk exposure.

In order for the lessor to obtain the tax benefits associated with equipment leasing, most countries require that the lease be treated as a "true lease" for tax purposes, as opposed to a conditional sale or other secured financing arrangement. This objective generally can be satisfied if the lessor has "tax ownership" of the leased equipment.

Each country applies differing rules for determining whether the party acting as lessor under a cross-border lease is the "owner" of the leased asset for tax purposes and is thereby entitled to claim tax allowances. In the United States and some other countries, the principal focus is on whether the lessor possesses substantially all attributes of economic ownership of the leased asset. Other countries such as the United Kingdom and Germany apply more

3.15 Strategic Financial Management

formalistic property law concepts and focus primarily on the location of legal title, although these countries usually also require that the lessor have some attributes of economic ownership or, at least, that the lessee have only a minimal economic interest in the equipment. In Japan, ownership of legal title is essential, but the lessor is only required under current law to obtain nominal incidents of economic ownership (all that is required is that the lease will provide a return of the equity investment plus a pre-tax profit of 1% of equipment cost). While Japan does have detailed tax lease guidelines, these guidelines are designed primarily to circumscribe the tax benefits available to the lessor in a cross-border lease to prevent undue tax deferral; they do not require the lessor to have a significant economic interest in the leased equipment.

The non-tax issues associated with cross-border leasing can best be described by reference to the various structural risks that may arise in a given transaction and must be addressed in the documentation.

4

Dividend Decisions

Learning Objectives

After going through this chapter student shall be able to understand:

- Basic introduction of Dividend Policy
- Practical considerations in Dividend Policy
- Theories on Dividend Policies
 - (1) Traditional Position
 - (2) Walter Approach
 - (3) Gordon Growth Model
 - (4) Modigliani and Miller (MM) Hypothesis
 - (5) Lintner's Model
 - (6) Radical Approach
 - (7) Dividend Discount Model

1. Introduction

The term 'dividend' refers to that portion of profit (after tax) which is distributed among the owners/shareholders of the firm and the profit which is not distributed is known as retained earnings. Dividend decisions are an important aspect of corporate financial policy since they can have an effect on the availability as well as the cost of capital. It is a decision made by the Board of Directors of a company and approved by the shareholders at the general meeting. Shareholders do not have the right to ask for dividend nor increase in the rate of dividend as the Board has the unfettered right. However, this power cannot be used arbitrarily or advantageously by the Board and therefore the Board has to evolve a dividend policy that maximize shareholders' wealth. Since dividend decision relates to the amount and timing of any cash payments made to the company's stakeholders, the decision is an important one for the firm as it may influence its capital structure and stock price. In addition, the decision may determine the amount of taxation that shareholders have to pay.

2. Dividend Policy

Firm's dividend policy divides net earnings into retained earnings and dividends. Retained earnings provide necessary funds to finance long term growth while dividends are paid in cash generally. Dividend policy of the firm is governed by:

4.2 Strategic Financial Management

(i) Long Term Financing Decision: When dividend decision is treated as a financing decision, net earnings are viewed as a source of long term financing. When the firm does not have profitable investment opportunities, dividend will be paid. The firm grows at a faster rate when it accepts highly profitable opportunities. External equity is raised to finance investments. But retained earnings are preferable because they do not involve floatation costs. Payment of cash dividend reduces the amount of funds necessary to finance profitable investment opportunities thereby restricting it to find other avenues of finance. Thus earnings may be retained as part of long term financing decision while dividends paid are distribution of earnings that cannot be profitably re-invested.

(ii) Wealth Maximisation Decision: Because of market imperfections and uncertainty, shareholders give higher value to near dividends than future dividends and capital gains. Payment of dividends influences the market price of the share. Higher dividends increase value of shares and low dividends decrease it. A proper balance has to be struck between the two approaches. When the firm increases retained earnings, shareholders' dividends decrease and consequently market price is affected. Use of retained earnings to finance profitable investments increases future earnings per share. On the other hand, increase in dividends may cause the firm to forego investment opportunities for lack of funds and thereby decrease the future earnings per share. Thus, management should develop a dividend policy which divides net earnings into dividends and retained earnings in an optimum way so as to achieve the objective of wealth maximization for shareholders. Such policy will be influenced by investment opportunities available to the firm and value of dividends as against capital gains to shareholders.

3. Practical Considerations in Dividend Policy

A discussion on internal financing ultimately turns to practical considerations which determine the dividend policy of a company. The formulation of dividend policy depends upon answers to the questions:

- whether there should be a stable pattern of dividends over the years or
- whether the company should treat each dividend decision completely independent. The practical considerations in dividend policy of a company are briefly discussed below:

(a) Financial Needs of The Company: Retained earnings can be a source of finance for creating profitable investment opportunities. When internal rate of return of a company is greater than return required by shareholders, it would be advantageous for the shareholders to re-invest their earnings. Risk and financial obligations increase if a company raises debt through issue of new share capital where floatation costs are involved. Mature companies having few investment opportunities will show high payout ratios; share prices of such companies are sensitive to dividend charges. So a small portion of the earnings are kept to meet emergent and occasional financial needs. Growth companies, on the other hand, have low payout ratios. They are in need of funds to finance fast growing fixed assets. Distribution of earnings reduces the funds of the company. They retain all the earnings and declare bonus shares to offset the dividend requirements of the shareholders. These companies increase the amount of dividends gradually as the profitable investment opportunities start falling.

(b) Constraints on Paying Dividends

(i) *Legal:* As per the provisions of the Companies Act, 2013, dividend has to be paid out of current profits or past profits after depreciation. Dividend is to be paid in cash but a company is allowed to capitalize profits or reserves (retained earnings) for issuing fully paid bonus shares. Capital profit may also be distributed as dividends if articles permit.

(ii) *Liquidity:* Payment of dividends means outflow of cash. Ability to pay dividends depends on cash and liquidity position of the firm. A mature company does not have much investment opportunities, nor are funds tied up in permanent working capital and, therefore has a sound cash position. For a growth oriented company in spite of good profits, it will need funds for expanding activities and permanent working capital and therefore it is not in a position to declare dividends.

(iii) *Access to the Capital Market:* By paying large dividends, cash position is affected. If new shares have to be issued to raise funds for financing investment programmes and if the existing shareholders cannot buy additional shares, control is diluted. Payment of dividends may be withheld and earnings are utilised for financing firm's investment opportunities.

(iv) *Investment Opportunities:* If investment opportunities are inadequate, it is better to pay dividends and raise external funds whenever necessary for such opportunities.

(c) Desire of Shareholders: The desire of shareholders (whether they prefer regular income by way of dividend or maximize their wealth by way of gaining on sale of the shares). In this connection it is to be noted that as per the current provisions of the Income Tax Act, 1961, tax on dividend is borne by the corporate as (Dividend Distribution Tax) and shareholders need not pay any tax on income received by way of dividend from domestic companies. To the extent small shareholders who are concerned with regular dividend income or who do not form a dominant group or retired and old people investing their savings, pension to purchase shares may prefer regular income and hence select shares of companies paying regular and liberal dividend.

As compared to those shareholders who prefer regular dividend as source of income, there are shareholders who prefer to gain on sale of shares at times when shares command higher price in the market. For such of those who prefer to gain on sale of shares, as per the provisions of the Income Tax Act, 1961, tax on capital gains (short-term @ 15%) are attracted if they sell the shares on holding less than one year and there is no tax on long-term sale (if held for more than one year). However, shareholders have to pay Securities Transaction Tax (STT) on sale of shares.

The dividend policy, thus pursued by the company should strike a balance on the desires of the shareholders who may belong either of the group as explained above. Also the dividend policy once established should be continued as long as possible without interfering with the needs of the company to create clientele effect.

(d) Stability of Dividends: Regular payment of dividend annually even if the amount of dividend may fluctuate year to year may not be, related with earnings.

4.4 Strategic Financial Management

(i) *Constant Dividend per Share*: Irrespective of the fluctuation in earnings, companies may follow the policy of paying a fixed amount per share as dividend every year. If the company reaches new level of earnings and expects to maintain it, the annual dividend per share may be increased.

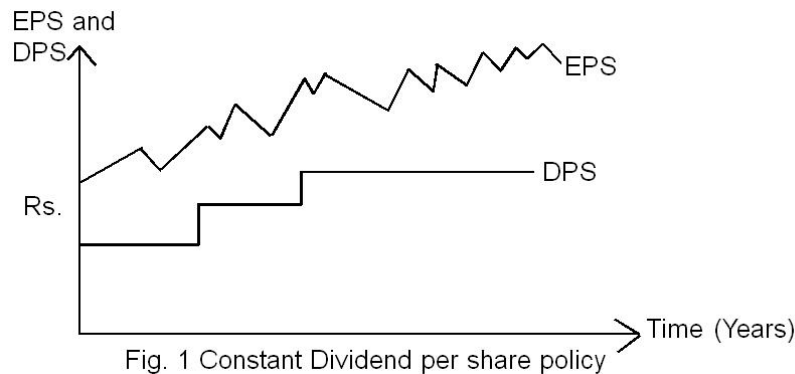


Fig. 1 Constant Dividend per share policy

With wide fluctuation in the pattern of earnings, it is necessary to build up surplus in years of higher than average earnings to maintain dividends in years of below average income. This gives rise to the creation of Dividend Equalisation Reserve Fund earmarked by marketable securities for easy conversion to cash at the time of paying dividends in bad years. This policy treats common shareholders at par with preference shareholders without giving them any preferred opportunities within the firm. It is preferred by persons and institutions that depend on dividend income to meet living and operating expenses.

(ii) *Constant Percentage of Net Earnings*: The ratio of dividend to earnings is known as pay out ratio. Some companies follow a policy of constant pay out ratio i.e. paying fixed percentage on net earnings every year. To quote from Page 74 of the annual report 2011 of Infosys Technologies Limited,

“The Dividend Policy is to distribute upto 30% of the Consolidated Profit after Tax (PAT) of the Infosys Group as Dividend.”

Contrast this to what Warren Buffet got to say about declaring a payout ratio. He says

“We will either pay large dividends or none at all if we can't obtain more money through re-investment (of those funds). There is no logic to regularly paying out 10% or 20% of earnings as dividends every year.”

Such a policy envisages that the amount of dividend fluctuates in direct proportion to earnings. If a company adopts 40% payout ratio, then 40% of every rupee of net earnings will be paid out. If a company earns ₹ 2/- per share, dividend per share will be 80 paise and if it earns ₹ 1.50 per share, dividend per share will be 60 paise.

Such a policy is related to company's ability to pay dividends. For losses incurred, no dividend shall be paid. Internal financing with retained earnings is automatic. At any given payout ratio, amount of dividends and any additions to retained earnings increase with increased earnings and decrease with decreased earnings. This policy has a conservative approach and provides

a guarantee against over/underpayment. Management is not allowed to pay dividend if profits are not earned in current year and at the same time, dividend is not allowed to forego if profits are earned.

(iii) *Small Constant Dividend per Share plus Extra Dividend*: The amount of dividend is set at high level and the policy is adopted for companies with stable earnings. For companies with fluctuating earnings, the policy is to pay a minimum dividend per share with a step up feature. The small amount of dividend is fixed to reduce the possibility of missing dividend payment. By paying extra dividend in period of prosperity, it enables the company to pay constant amount of dividend regularly without default and allows flexibility for supplementing shareholders' income when company's earnings are higher than usual, without committing to make larger payments as part of further fixed dividend. This policy allows some shareholders to plan on set amounts of cash and at the same time be pleased when extra dividends are announced.

A firm following policy of stable dividend in Figure 1 will command higher market price for shares than firm which varies dividend with cyclical fluctuation in earnings as in Figure 2.

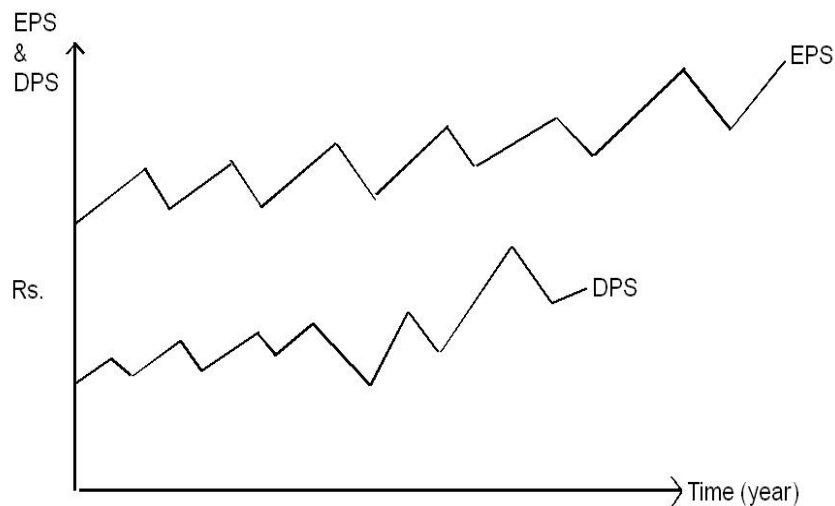


Fig. 2 Dividend policy at Constant Payout ratio

There is, however, a danger of a company with a pattern of stable dividends missing dividend payment in a year as this break will have severe effect on investors than failure to pay dividend by a company with unstable dividend policy. It is prudent for companies to maintain stability of dividends during lean periods. The dividend rate is to be fixed at a conservative figure so that it can be maintained even in such periods. To give benefit of company's prosperity extra dividend can be declared. When the company fails to pay extra dividend, it does not have a depressing effect on investors.

(e) Form of Dividend: Dividends can be divided into following forms:

(i) *Cash dividend*: The company should have sufficient cash in bank account when cash dividends are declared. If it does not have enough bank balance, it should borrow funds. For

4.6 Strategic Financial Management

stable dividend policy a cash budget may be prepared for coming period to indicate necessary funds to meet regular dividend payments.

The cash account and reserve account of the company will be reduced when cash dividend is paid. Both total assets and net worth of the company are reduced when cash dividend is distributed. According to Hastings, market price of share drops by the amount of cash dividend distributed.

(ii) *Stock Dividend (Bonus shares)*: It is distribution of shares in lieu of cash dividend to existing shareholders. Such shares are distributed proportionately thereby retaining proportionate ownership of the company. If a shareholder owns 100 shares at a time, when 10% dividend is declared he will have 10 additional shares thereby increasing the equity share capital and reducing reserves and surplus (retained earnings). The total net worth is not affected by bonus issue.

Advantages: There are many advantages both to the shareholders and to the company. Some of the important ones are listed as under:

- (1) *To Share Holders*: (a) Tax benefit –At present there is no tax on dividend received.
(b) Policy of paying fixed dividend per share and its continuation even after declaration of stock dividend will increase total cash dividend of the share holders in future.
- (2) *To Company*: (a) Conservation of cash for meeting profitable investment opportunities.
(b) Cash deficiency and restrictions imposed by lenders to pay cash dividend.

Limitations: Some of the limitations are:

- (1) *To Shareholders*: Stock dividend does not affect the wealth of shareholders and therefore it has no value for them. This is because the declaration of stock dividend is a method of capitalising the past earnings of the shareholders and is a formal way of recognising earnings which the shareholders already own. It merely divides the company's ownership into a large number of share certificates. James Porterfield regards stock dividends as a division of corporate pie into a larger number of pieces. Stock dividend does not give any extra or special benefit to the shareholder. His proportionate ownership in the company does not change at all. Stock dividend creates a favourable psychological impact on the shareholders and is greeted by them on the ground that it gives an indication of the company's growth.
- (2) *To Company*: Stock dividends are more costly to administer than cash dividend. If the company continues to issue bonus shares, this cost can accumulate in the future. Further, company doesn't receive any cash while issuing bonus shares. Also, bonus issue increases outstanding shares. And, this reduces the EPS of the company.

4. Theories on Dividend Policies

The important theories on dividend policies are discussed as follows:

4.1 Traditional Position

According to the traditional position expounded by Graham and Dodd, the stock market places considerably more weight on dividends than on retained earnings. For them, the stock market is overwhelmingly in favour of liberal dividends as against niggardly dividends. Their view is expressed quantitatively in the following valuation model:

$$P = m (D + E/3)$$

Where,

P = Market Price per share

D = Dividend per share

E = Earnings per share

m = a Multiplier.

As per this model, in the valuation of shares the weight attached to dividends is equal to four times the weight attached to retained earnings. In the model prescribed, E is replaced by (D+R) so that

$$\begin{aligned} P &= m \{D + (D+R)/3\} \\ &= m (4D/3) + m (R/3) \end{aligned}$$

The weights provided by Graham and Dodd are based on their subjective judgments and not derived from objective empirical analysis. Notwithstanding the subjectivity of these weights, the major contention of the traditional position is that a liberal payout policy has a favourable impact on stock prices.

4.2 Walter Approach

The formula given by Prof. James E. Walter shows how dividend can be used to maximise the wealth position of equity holders. He argues that in the long run, share prices reflect only the present value of expected dividends. Retentions influence stock prices only through their effect on further dividends. The formula is simple to understand and easy to compute. It can envisage different possible market prices in different situations and considers internal rate of return, market capitalisation rate and dividend payout ratio in the determination of market value of shares. However, the formula does not consider all the factors affecting dividend policy and share prices. Moreover, determination of market capitalisation rate is difficult. Further, the formula ignores such factors as taxation, various legal and contractual obligations, management policy and attitude towards dividend policy and so on.

The relationship between dividend and share price on the basis of Walter's formula is shown below:

4.8 Strategic Financial Management

$$V_c = \frac{D + \frac{R_a}{R_c} (E - D)}{R_c}$$

Where,

- V_c = Market value of the ordinary shares of the company
- R_a = Return on internal retention, i.e., the rate company earns on retained profits
- R_c = Cost of Capital
- E = Earnings per share
- D = Dividend per share.

A close study of the formula indicates that Professor Walter emphasises two factors which influence the market price of a share. The first is the dividend per share and the second is the relationship between internal return on retained earnings and the market expectation from that company as reflected in the capitalisation rate. In other words, if the internal return of retained earnings is higher than market capitalisation rate, the value of ordinary shares would be high even if dividends are low. However, if the internal return within the business is lower than what the market expects, the value of the share would be low. In such a case, shareholders would prefer a higher dividend so that they can utilise the funds so obtained elsewhere in more profitable opportunities.

The formula given by Prof. Walter explains why market prices of shares of growth companies are high even though the dividend paid out is low. It also explains why the market price of shares of certain companies which pay higher dividends and retain very low profits is also high.

As explained above, market price is dependent upon two factors; firstly, the quantum of dividend and secondly, profitable opportunities available to the company in investing the earnings retained. It is obvious that when a company retains a part of its profits, it has to think in terms of the cost of such retention. Retention of profits depends upon whether it is cheaper and more profitable for shareholders of the company to have corporate earnings retained in the business or get the same in the form of cash dividend. This involves a comparison between the cost of retained earnings and the cost of distributing them. The cost of retained earnings, therefore, involves an opportunity cost, i.e., the benefits which shareholders forego in terms of leaving the funds in the business.

Illustration 1

XYZ Company which earns ₹ 10 per share is capitalized at 10 percent and has a return on investment of 12 percent. Determine the optimum dividend payout ratio and the price of the share at the payout using Walter's dividend policy model.

Solution

According to Walter's approach, the optimum dividend payout ratio would be zero as $R_a > R_c$ because the value of the share of the firm would be maximum.

$$V_c = \frac{D + \frac{R_a}{R_c} (E - D)}{R_c} = \frac{(0.12/0.10)(₹ 10)}{0.10} = ₹ 120$$

Illustration 2

The following figures are collected from the annual report of XYZ Ltd.:

	₹
Net Profit	30 lakhs
Outstanding 12% preference shares	100 lakhs
No. of equity shares	3 lakhs
Return on Investment	20%
Cost of Equity (Ke)	16%

What should be the approximate dividend pay-out ratio so as to keep the share price at ₹ 42 by using Walter model?

Solution

	₹ in lakhs
Net Profit	30
Less: Preference dividend	12
Earning for equity shareholders	18
Therefore earning per share	18/3 = ₹ 6.00

Cost of capital i.e. (Ke) = 16%

Let, the dividend pay-out ratio be X and so the share price will be:

$$P = \frac{D}{K_e} + \frac{r(E - D)}{K_e}$$

Here D = 6x; E = ₹ 6; r = 0.20 and Ke = 0.16 and P = ₹ 42

$$\text{Hence } ₹ 42 = \frac{6x}{0.16} + \frac{0.2(6 - 6x)}{0.16 \times 0.16}$$

$$\text{or } ₹ 42 = 37.50X + 46.875 (1 - x)$$

$$= 9.375x = 4.875$$

$$x = 0.52$$

So, the required dividend payout ratio will be = 52%

4.10 Strategic Financial Management

Illustration 3

The following information pertains to M/s XY Ltd.

Earnings of the Company	₹ 5,00,000
Dividend Payout ratio	60%
No. of shares outstanding	1,00,000
Equity capitalization rate	12%
Rate of return on investment	15%

- (i) What would be the market value per share as per Walter's model?
(ii) What is the optimum dividend payout ratio according to Walter's model and the market value of Company's share at that payout ratio?

Solution

M/s XY Ltd.

- (i) Walter's model is given by

$$P = \frac{D + (E - D)(r / k_e)}{K_e}$$

Where P=Market price per share.

E=Earnings per share = ₹ 5

D=Dividend per share = ₹ 3

r =Return earned on investment = 15%

K_e=Cost of equity capital = 12%

$$P = \frac{3 + (5 - 3) \times \frac{0.15}{0.12}}{0.12} = \frac{3 + 2.0 \times \frac{.15}{.12}}{0.12} = ₹ 45.83$$

- (ii) According to Walter's model when the return on investment is more than the cost of equity capital, the price per share increases as the dividend pay-out ratio decreases. Hence, the optimum dividend pay-out ratio in this case is nil.

So, at a pay-out ratio of zero, the market value of the company's share will be:

$$\frac{0 + (5 - 0) \frac{0.15}{0.12}}{0.12} = ₹ 52.08$$

Illustration 4

From the following particulars given in the table calculate the market share price (for growth, normal and declining firms) using Walter's approach to dividend model. Also calculate the share price, assuming the DPS is ₹ 3.

Factors	$R > R_c$	$R = R_c$	$R < R_c$
R_a (rate of return on retained earnings)	25%	20%	15%
R_c (cost of capital)	20%	20%	20%
E (Earning per share)	₹ 5	₹ 5	₹ 5
D (Dividend per share)	₹ 5	₹ 5	₹ 5

Solution

By applying the Walter's formula the share price for the three categories of firms is ₹ 25

$$V_c = \frac{D + \frac{R_a}{R_c}(E-D)}{R_c} = \frac{5 + \frac{25}{20}(5-5)}{20} = ₹ 25$$

If it is assumed that DPS is ₹ 3 then the value of the share for different firms will be as follows:

- a) For Growth firm = ₹ 27.50
- b) For Normal firm = ₹ 25
- c) For Declining firm = ₹ 22.50

From the above it follows that

- a) When the rate of return is greater than the cost of capital $R > R_c$, the price per share increase as the D/P decrease. The optimum pay out ratio for the growth firm will be Nil.
- b) When the rate of return is equal to the cost of capital is $R = R_c$, then the price per share does not vary with the changes in D/P ratio. The optimum payout ratio for the normal firm is irrelevant.
- c) When the rate of return is less than the cost of capital i.e. $R < R_c$ the price per share increases as the D/P ratio increases. The optimum payout ratio for the declining firm is 100%.

Illustration 5

The following information is supplied to you:

	₹
Total Earnings	2,00,000
No. of equity shares (of ₹ 100 each)	20,000
Dividend paid	1,50,000
Price/Earning ratio	12.5

Applying Walter's Model

- (i) Ascertain whether the company is following an optimal dividend policy.
- (ii) Find out what should be the P/E ratio at which the dividend policy will have no effect on the value of the share.
- (iii) Will your decision change, if the P/E ratio is 8 instead of 12.5?

4.12 Strategic Financial Management

Solution

- (i) The EPS of the firm is ₹ 10 (i.e., ₹ 2,00,000/20,000). The P/E Ratio is given at 12.5 and the cost of capital, k_e , may be taken at the inverse of P/E ratio. Therefore, k_e is 8 (i.e., $1/12.5$). The firm is distributing total dividends of ₹ 1,50,000 among 20,000 shares, giving a dividend per share of ₹ 7.50. The value of the share as per Walter's model may be found as follows:

$$P = \frac{D}{K_e} + \frac{(r/K_e)(E-D)}{K_e} = \frac{7.50}{.08} + \frac{(.10/.08)(10-7.5)}{.08} = ₹ 132.81$$

The firm has a dividend payout of 75% (i.e., ₹ 1,50,000) out of total earnings of ₹ 2,00,000. Since, the rate of return of the firm, r , is 10% and it is more than the k_e of 8%, therefore, by distributing 75% of earnings, the firm is not following an optimal dividend policy. The optimal dividend policy for the firm would be to pay zero dividend and in such a situation, the market price would be

$$P = \frac{D}{k_e} + \frac{(r/K_e)(E-D)}{K_e} = \frac{0}{.08} + \frac{(.10/.08)(10-0)}{.08} = ₹ 156.25$$

So, theoretically the market price of the share can be increased by adopting a zero payout.

- (ii) The P/E ratio at which the dividend policy will have no effect on the value of the share is such at which the k_e would be equal to the rate of return, r , of the firm. The K_e would be 10% ($=r$) at the P/E ratio of 10. Therefore, at the P/E ratio of 10, the dividend policy would have no effect on the value of the share.
- (iii) If the P/E is 8 instead of 12.5, then the k_e which is the inverse of P/E ratio, would be 12.5 and in such a situation $k_e > r$ and the market price, as per Walter's model would be

$$P = \frac{D}{K_e} + \frac{(r/K_e)(E-D)}{K_e} = \frac{7.50}{.125} + \frac{(.1/.125)(10-7.5)}{.125} = ₹ 76$$

4.3 Gordon Growth Model: Another theory which contends that dividends are relevant is the Gordons' model. This model explicitly relates the market value of the firm to dividend policy. It is based on the following assumptions:

- The firm is an all equity firm, and it has no debt.
- No external financing is used and investment programmes are financed exclusively by retained earnings.
- The internal rate of return, r , of the firm is constant.
- The appropriate discount rate, k_e , for the firm remains constant.
- The firm has perpetual life.
- The retention ratio, b , once decided upon, is constant. Thus, the growth rate, $g = br$, is also constant.
- The discount rate is greater than the growth rate, $k_e > br$.

Myron Gordon argues that what is available at present is preferable to what may be available in the future. As investors are rational, they want to avoid risk and uncertainty. They would prefer to pay a higher price for shares on which current dividends are paid. Conversely, they

would discount the value of shares of a firm which postpones dividends. The discount rate would vary with the retention rate.

The relationship between dividend and share price on the basis of Gordon's formula is shown as:

$$V_E = \left[\frac{d_0 (1+g)}{k_e - g} \right]$$

Where,

V_E = Market price per share (ex-dividend)

d_0 = Current year dividend

g = Constant annual growth rate of dividends

K_e = Cost of equity capital (expected rate of return).

The formula given by Gordon shows that when the rate of return is greater than the discount rate, the price per share increases as the dividend ratio decreases and if the return is less than discount rate it is vice-versa. The price per share remains unchanged where the rate of return and discount rate are equal.

Illustration 6

Starlite Limited is having its shares quoted in major stock exchanges. Its share current market price after dividend distributed at the rate of 20% per annum having a paid-up shares capital of ₹ 10 lakhs of ₹ 10 each. Annual growth rate in dividend expected is 2%. The expected rate of return on its equity capital is 15%.

Calculate the value of Starlite Limited's share based on Gordons' model.

Solution

Dividend distributed during the year = $10,00,000 \times \frac{20}{100}$

= ₹ 2,00,000

$$V_E = \left[\frac{d_0 (1+g)}{k_e - g} \right]$$

$$= \frac{₹ 2,00,000 (1+0.02)}{0.15 - 0.02} = \frac{₹ 2,00,000 (1.02)}{0.13}$$

= ₹ 15,69,230.77

Value per share = $\left[\frac{₹ 15,69,230.77}{1,00,000} \right] = ₹ 15.69$

4.14 Strategic Financial Management

Illustration 7

Again taking an example of three different firms i.e. growth, normal and declining firm, the Gordon model can be applied with the help of a following example:

Factors	Growth Firm $R > R_c$	Normal Firm $R = R_c$	Declining Firm $R < R_c$
R_a (rate of return on retained earnings)	15%	10%	8%
R_c (Cost of Capital)	10%	10%	10%
E (Earning Per Share)	₹ 10	₹ 10	₹ 10
b (Retained Earnings)	0.6	0.6	0.6
$1 - b$	0.4	0.4	0.4

Solution

By applying the formulae as given under Gordon's model, the share price is equal to ₹ 400. Similarly, the share price for the normal growth and declining firm will be ₹ 100 and ₹ 77 respectively.

Further, if the value of b is changed from 0.4 to 0.6, the new share price will be as follows:

Growth Firm ₹ 150

Normal Firm ₹ 100

Declining Firm ₹ 88

From the above analysis it can be concluded that.

When $r > k$, the market value increases with retention ratio.

When $r < k$, the market value of share stands to decrease.

When $r = k$, the market value is not affected by dividend policy.

The conclusion of the Gordon's model are similar to that of Walter's model.

4.4 Modigliani and Miller (MM) Hypothesis: Modigliani and Miller Hypothesis is in support of the irrelevance of dividends. Modigliani and Miller argue that firm's dividend policy has no effect on its value of assets and is, therefore of no consequence i.e. dividends are irrelevant to shareholders wealth. According to them, '*Under conditions of perfect capital markets, rational investors, absence of tax discrimination between dividend income and capital appreciation, given the firm's investment policy, its dividend policy may have no influence on the market price of shares*'.

The hypothesis is based on the following assumptions:

- The firm operates in perfect capital markets in which all investors are rational and information is freely available to all.
- There are no taxes. Alternatively, there are no differences in the tax rates applicable to capital gains and dividends.

- The firm has a fixed investment policy.
- There are no floatation or transaction costs.
- Risk of uncertainty does not exist. Investors are able to forecast future prices and dividends with certainty, and one discount rate is appropriate for all securities and all time periods. Thus, $r = k = k_t$ for all t .

MM Hypothesis is primarily based on the arbitrage argument. Through the arbitrage process, the MM Hypothesis discusses how the value of the firm remains same whether the firm pays dividend or not. It argues that the value depends on the earnings of the firm and is unaffected by the pattern of income distribution. Suppose, a firm which pays dividends will have to raise funds externally to finance its investment plans. So, MM's argument, that dividend policy does not affect the wealth of the shareholders, implies that when the firm pays dividends, its advantage is offset by external financing. This means that the terminal value of the share declines when dividends are paid. Thus, the wealth of the shareholders - dividends plus terminal price - remains unchanged. As a result, the present value per share after dividends and external financing is equal to the present value per share before the payments of dividends. Thus, the shareholders are indifferent between payment of dividends and retention of earnings.

Market price of a share after dividend declared on the basis of MM model is shown below:

$$P_0 = \frac{P_1 + D_1}{1 + K_e}$$

Where,

P_0 = The prevailing market price of a share

K_e = The cost of equity capital

D_1 = Dividend to be received at the end of period one

P_1 = Market price of a share at the end of period one.

If the firm were to finance all investment proposals, the total amount raised through new shares will be ascertained with the help of the following formula:

$$\Delta N = \frac{I - (E - nD_1)}{P_1}$$

Where,

ΔN = Change in the number of shares outstanding during the period

n = Number of shares outstanding at the beginning of the period

I = Total investment amount required for capital budget

E = Earnings of net income of the firm during the period.

4.16 Strategic Financial Management

The theory of 'Home-Made dividends' further supports the MM argument.

Let us assume that Mrs. X holds 80 shares in a company whose share price after it declared a dividend of ₹ 2 per share is ₹ 42. You would expect the ex-dividend price to become ₹ 40 after the record date. Mrs. X does not like ₹ 2 per share – she had expected ₹ 3 per share and, therefore, she resorts to 'home made dividends'

What is this 'home made dividends'?

Mrs. X's current wealth is ₹ 42 x 80 = ₹ 3,360

Mrs. X's post dividend wealth would be ₹ 40 x 80 + ₹ 160 = ₹ 3,360 (i.e. market price + dividend on hand), if she is happy with the ₹ 2 per share dividend.

She can derive the same value by selling 2 shares at ex-dividend price of ₹ 40 x 2 = ₹ 80. Her wealth now is ₹ 40 x 78 + ₹ 160 + ₹ 80 = ₹ 3,360

If the company, in deference to the wishes of Mrs. X had declared ₹ 3 per share as dividend, her post dividend wealth would be ₹ 39x78 + ₹ 240 = ₹ 3,360

In all cases above, the wealth of the shareholder never changed, in spite of the fact that the amount of dividend varies.

Hence, any shareholder can always resort to 'home made dividends' to realise his returns from the investment. The amount of dividend declared by the Board is irrelevant to his/her wealth.

A discerning student of finance should be able to understand the application of 'home made dividends' and the irrelevance of dividends in the following news story of Jan 16th 2003:

Microsoft Corp. yesterday acted to quiet shareholders clamoring for some of the company's \$43.4 billion cash surplus, promising to issue its first-ever dividend this year.

The world's largest software maker also announced a 2-for-1 stock split and said its second fiscal quarter yielded record revenue and profits just shy of expectations. Still, shares declined in after-hours trading on the company's lowered sales forecast for the remainder of the year.

The stock had already closed at \$55.35, down 92 cents for the day. After the announcement, it fell \$1.71 more, or 3 percent, in after-hours sessions.

The dividend declaration comes on the heels of President Bush's Jan. 7 tax-reform plan, which would exempt shareholders from income tax on dividends from tax-paying corporations. But Microsoft said the two developments aren't connected. Microsoft's declaring a dividend "makes enough sense," said Michael Holland, manager of the Holland Balanced Fund, which invests \$52 million and has Microsoft as its biggest holding. Now Microsoft's cash "can be delivered to shareholders, including (Microsoft Chairman) Bill Gates," he said...

Read more: <http://www.seattlepi.com/business/article/Microsoft-surprises-will-issue-first-ever-1105495.php#ixzz20m3ZMENA>

Clearly the reason for share price reduction is about business prospects and not about a voluminous maiden dividend for a company that never declared a dividend, since it listed in 1986.

Merton Miller view: Does declaration of dividend/higher dividend influence shareholder wealth? Restated, “should markets price shares of companies that pay ‘generous dividends’, at a premium?”

Perhaps, this question will never be answered by Corporate Finance theory to the satisfaction of every on-looker, especially the practitioners

Merton Miller answers this question using the analogy of “bent stick in the water”. Looking from outside, the stick is bent inside the water. Our eyes deceive us because we know that the stick is fine! Miller's point is that a corporate's value is driven by its investment policy and not by its financing policy. The investment policy of the firm is set ahead of time and is not altered by changes in dividend policy. Dividend is merely putting some money in the pockets of the shareholder while taking it out from the other pocket. To quote him:

“Dividend Policy may not be an effective management tool and may not even be completely under your control in a world of rational expectations; but there are things that do matter and over which you do have more control. I refer, of course, to the firm's investment decisions and to the engineering, production, personnel, marketing and research decisions that underlie them. These decisions are in what economists call the "real" side of the business and they generate the firm's current and future cash flows. And that you will find is what really matters”.

Illustration 8

P.L. Engineering Ltd. belongs to a risk class for which the capitalisation rate is 10 per cent. It currently has outstanding 10,000 shares selling at ₹ 100 each. The firm is contemplating the declaration of a dividend of ₹ 5 per share at the end of the current financial year. It expects to have a net income of ₹ 1,00,000 and has a proposal for making new investments of ₹ 2,00,000. Show how under M - M Hypothesis, the payment of dividend does not affect the value of the firm.

Solution

(a) Value of the firm when dividends are not paid:

- (i) Price per share at the end of the year 1.

$$₹ 100 = \frac{P_1}{1.10}$$

$$\therefore P_1 = 110$$

- (ii) Amount required to be raised from the issue of new shares.

$$= (₹ 2,00,000 - ₹ 1,00,000)$$

$$= ₹ 1,00,000$$

- (iii) Number of additional shares to be issued.

$$\frac{₹ 1,00,000}{₹ 110} = \frac{10,000}{11} \text{ shares} = 909 \text{ shares}$$

4.18 Strategic Financial Management

(iv) Value of the firm
= (10000 + 909) x ₹ 110
= ₹ 1199990

(b) Value of the firm, when dividends are paid:

(i) Price per share at the end of year 1

$$= \frac{1}{(1 + K_e)} (D_1 + P_1)$$

$$₹ 100 = \frac{1}{1.10} (₹ 5 + P_1)$$

$$110 = 5 + P_1$$

$$P_1 = 105$$

(ii) Amount required to be raised from the issue of new shares.

$$\Delta n P_1 = I - (E - n D_1)$$

$$= ₹ 2,00,000 - (₹ 1,00,000 - 10,000 \times 5) = ₹ 1,50,000$$

(iii) Number of additional shares to be issued.

$$\Delta n = \frac{₹ 1,50,000}{₹ 105} = \frac{10,000}{7} \text{ shares} = 1429 \text{ shares}$$

(iv) Value of the firm

$$nP_0 = (10000 + 1429) \times 105$$

$$= ₹ 1200045$$

Thus, it can be seen that the value of the firm remains almost the same whether dividends are paid or not. Further, the illustration clearly demonstrates that the shareholders are indifferent between the retention of profits and the payment of dividend.

Illustration 9

ABC Ltd. has a capital of ₹ 10 lakhs in equity shares of ₹ 100 each. The shares are currently quoted at par. The company proposes declaration of a dividend of ₹ 10 per share at the end of the current financial year. The capitalisation rate for the risk class to which the company belongs is 12%.

What will be the market price of the share at the end of the year, if

(i) dividend is not declared?

(ii) dividend is declared?

(iii) assuming that the company pays the dividend and has net profits of ₹ 5,00,000 and makes new investments of ₹ 10 lakhs during the period, how many new shares must be issued? Use the M.M. model.

Solution

Under M.M. Model, the following formula is used to ascertain the market price of Equity Shares:

$$P_0 = \frac{1}{1+K_e} \times (D_1 + P_1)$$

P_0 = Prevailing market price of a share i.e., ₹ 100 in this case. (quoted at Par)

P_1 = Market Price of a share at the end of period one.

D_1 = Dividend to be received at the end of period one.

K_e = Cost of Equity Capital.

(i) If the dividend is not declared

$$100 = \frac{1}{1+0.12} \times P_1$$

$$P_1 = 100 \times 1.12 = ₹ 112$$

The market price of the Equity share at the end of the year would be ₹ 112.

(ii) If the dividend is declared

$$100 = \frac{1}{1+0.12} \times (10 + P_1)$$

$$100 = \frac{10 + P_1}{1.12}$$

$$112 = 10 + P_1$$

$$P_1 = 112 - 10 = ₹ 102$$

The market price of the equity share at the end of the year would be ₹ 102.

(iii) Price of the Equity share would be ₹ 102, if the dividend is paid.

Hence Number of shares to be issued:

$$n_{p1} = I - (NP - nD_1)$$

Where n = No. of New shares to be issued

NP = Net Profit

nD_1 = Total dividend paid (see note 1)

I = Investment

$$n_{102} = 10,00,000 - (5,00,000 - 1,00,000)$$

$$n_{102} = 6,00,000$$

$$n = \frac{6,00,000}{102} = 5,883 \text{ shares to be issued}$$

4.20 Strategic Financial Management

Note: No. of Equity shares existing = $\frac{10,00,000}{100} = 10,000$ shares

Dividend paid $10,000 \times 10$ per share = ₹ 1,00,000

Illustration 10

The following is the data regarding two Companies 'X', and 'Y' belonging to the same equivalent risk class:

	Company X	Company Y
Number of ordinary shares	90,000	1,50,000
Market price per share	₹ 1.20	Re. 1.00
6% Debentures	60,000	—
Profit before interest	₹ 18,000	₹ 18,000

All profits after debenture interest are distributed as dividends.

You are required to:

- Explain how under Modigliani & Miller approach, an investor holding 10% of shares in Company 'X' will be better off in switching his holding to Company 'Y'.
- List the assumptions implicit in your answer to 'a' above.

Solution

Working Notes:

	Company X	Company Y
Profit before interest	18,000	18,000
Less: Interest	<u>3,600</u>	—
Net Profit	<u>14,400</u>	<u>18,000</u>
All profits after debenture interest are Distributed as dividends.		
Dividend per share	<u>14,400</u>	<u>18,000</u>
	90,000	1,50,000
	= ₹ 0.16	= ₹ 0.12

- Present income of the investor holding 10% of shares in company X:

10% of shares = 9,000 shares \times 0.16 = ₹ 1,440 dividend.

He will dispose of in the market and get ₹ 10,800 (i.e. $9,000 \times 1.20$).

The same amount of ₹ 10,800 will be invested in Company Y. 10,800 shares will be purchased at Re. 1.00 per share. Then he will get dividend of ₹ 1,296 ($10,800 \times 0.12$). Hence, he will not be better off in switching his holding to company Y.

(b) Assumptions of Modigliani & Miller approach:

- Existence of perfect capital market, where all investors are rational.
- No tax differential between dividend income and capital gain.
- Transaction and floatation costs do not exist.
- Risk of uncertainty does not exist.
- The firm has a fixed investment policy.
- Free and uniform access to relevant information of capital market.
- No investor can sway the market forces.
- The cost of equity is equal to shareholders' expectations.
- Securities are infinitely divisible.
- Organisation has a fixed investment policy.

Alternative to (a) above:

M & M approach by applying arbitrage process:

<i>Particulars</i>	<i>= Market value of Firms</i>	
	<i>X</i>	<i>Y</i>
(i) Market value of Equity shares	1,08,000 (90,000 × 1.20)	1,50,000 (1,50,000 × 1.00)
(ii) Market value of Debentures	60,000	–
Value of Firm	1,68,000	1,50,000

According to MM's approach, the marginal investor would switch from overvalued to undervalued firm by selling his holdings in the firm X (levered one and overvalued one) and would buy the same percentage of shares of the firm Y. The arbitrage process will work out as follows:

Investor will dispose 10% of shares in Company X and realise

9,000 shares at ₹ 1.20 each = 10,800

Add: He will borrow 10% of

60,000 debt at 6% interest 6,000

Total amount 16,800

With this amount, the investor will buy 16,800 shares in Company Y at ₹ 1.00 each. Then compare the resultant income as follows:

Present income in X (as worked out above) = 1,440

Proposed income in Y:

1,50,000 shares PBT 18,000

16,800 shares ?

4.22 Strategic Financial Management

$$\frac{16,800}{1,50,000} \times 18,000 = ₹ 2016$$

$$\text{Less: Interest on debt } 6,000 \times 6\% = ₹ 360$$

$$\text{Net Income} = ₹ 1656$$

This shows that the investor will be better off in switching his holdings to Company Y.

Notes:

- (i) When the investor sells equity in Company X and buys equity in company Y with personal leverage, the market value of equity of Company X tends to decline and the market value of equity of company Y tends to rise. This process will continue till the market values of both the companies are in equilibrium.
- (ii) The borrowings of ₹ 6,000 has to be taken on the same terms and conditions as corporate borrowing. Hence, 6% interest rate has been adopted.
- (iii) Companies should belong to the same equivalent risk class.
- (iv) Taxes do not exist and hence tax has not been taken into account.

Illustration 11

With the help of following figures calculate the market price of a share of a company by using:

- (i) *Walter's formula*
- (ii) *Dividend growth model (Gordon's formula)*

Earning per share (EPS)	₹ 10
Dividend per share (DPS)	₹ 6
Cost of capital (k)	20%
Internal rate of return on investment	25%
Retention Ratio	60%

Solution

Market price per share by

- (i) **Walter's formula:**

$$V_c = \frac{D + \frac{R_a}{R_c} (E - D)}{R_c}$$

$$P = \frac{6 + \frac{.25}{.20} (10 - 6)}{.20}$$

$$P = ₹ 55$$

(ii) Gordon's formula (Dividend Growth model): When the growth is incorporated in earnings and dividend, the present value of market price per share (P_0) is determined as follows

Gordon's theory:

$$P_0 = \frac{E(1-b)}{k-br}$$

Where,

P_0 = Present market price per share.

E = Earning per share

b = Retention ratio (i.e. % of earnings retained)

r = Internal rate of return (IRR)

Hint:

Growth rate (g) = br

$$P_0 = \frac{10(1-.60)}{.20 - (.60 \times .25)} = ₹ \frac{4}{.05} = ₹ 80$$

Illustration 12

Following are the details regarding three companies X Ltd., Y Ltd. and Z Ltd.

	X Ltd.	Y Ltd.	Z Ltd.
Internal Rate of return (%)	5	20	15
Cost of equity capital (%)	15	15	15
Earning per share	₹ 10	₹ 10	₹ 10

Calculate the value of an equity share of each of those companies applying Walter's formula when dividend payment ratio (DIP) ratio is (a) 75% (b) 50% (c) 80%.

Solution

Value of an equity share according to Walter's formula is:

$$V_c = \frac{D + \frac{R_a}{R_c} (E - D)}{R_c}$$

Where,

V_c = Market value of the ordinary share of the company.

R_a = Return on internal retention i.e. the rate company earns in retained profits.

R_c = Capitalisation rate i.e. the rate expected by investors by way of return from particular category of shares.

E = Earnings per share

D = Dividend per share

4.24 Strategic Financial Management

(i) Market Price per share when D/P ratio is 75%.

X Ltd.	Y Ltd.	Z Ltd.
$7.5 + \frac{.05}{.15} (10 - 7.5)$ <hr style="width: 100%;"/> $.15$	$7.5 + \frac{.20}{.15} (10 - 7.5)$ <hr style="width: 100%;"/> $.15$	$7.5 + \frac{.15}{.15} (10 - 7.5)$ <hr style="width: 100%;"/> $.15$
= ₹ 56	= ₹ 72	= ₹ 67

(ii) When D/P ratio is 50%

$5 + \frac{.05}{.15} (10 - 5)$ <hr style="width: 100%;"/> $.15$	$5 + \frac{.20}{.15} (10 - 5)$ <hr style="width: 100%;"/> $.15$	$5 + \frac{.15}{.15} (10 - 5)$ <hr style="width: 100%;"/> $.15$
= ₹ 44	= ₹ 78	= ₹ 67

(iii) When D/P ratio is 80%

$8 + \frac{.05}{.15} (10 - 8)$ <hr style="width: 100%;"/> $.15$	$8 + \frac{.20}{.15} (10 - 8)$ <hr style="width: 100%;"/> $.15$	$8 + \frac{.15}{.15} (10 - 8)$ <hr style="width: 100%;"/> $.15$
= ₹ 58	= ₹ 71	= ₹ 67

Conclusions:

X Ltd.: This company may be considered as declining firm because IRR is lower than the cost of capital. It will therefore, be appropriate for this company to distribute the earnings among its shareholders.

Y Ltd.: This company may be considered as going firm because IRR is higher than the cost of capital. It will therefore, be appropriate for this company to retain the earnings.

Z Ltd.: This company may be considered as normal firm because IRR is equal to the cost of capital. D/P has no impact on value per share.

4.5 Lintner's Model: The classic study of the actual dividend behavior was done by John Lintner in 1956. The study was conducted in two stages. First, he conducted a series of interviews with businessmen to form a view of how they went about their dividends decisions. He then formed a model on the basis of those interviews which could be tested on a larger data. His formula is

$$D_1 = D_0 + [(EPS \times \text{Target Payout}) - D_0] \times A_F$$

Where

D_1 = Dividend in year 1

D_0 = Dividend in year 0

EPS = Earning Per Share

A_F = Adjustment Factor

Lintner model has two parameters:

- (1) The target pay-out ratio and
- (2) The spread at which current dividends adjust to the target.

From the interviews he conducted, it emerged that investment needs were not a major consideration in the determination of dividend policy, rather the decision to change the dividend was usually a response to a significant change in earnings which had disturbed the existing relationship between earnings and dividends. Lintner concluded that

- (1) Companies tend to set long run target dividends-to-earning ratios according to the amount of positive net present value (NPV) project that are available.
- (2) Earning increases are not always sustainable. As a result, dividend policy is not changed until managers can see that new earnings level are sustainable.

4.6 Radical Approach: This approach takes into consideration the tax aspects on dividend i.e. the corporate tax and the personal tax. Also it considers the fact that tax on dividend and capital gains are taxed as different rate. The approach is based on one premise that if tax on dividend is higher than tax on capital gains, the share of the company will be attractive if the company is offering capital gain. Similarly, if tax on dividend is less than the tax on capital gains, i.e. company offering dividend rather than capital gains, will be priced better.

4.7 Dividend Discount Model: It is a financial model that values shares at the discounted value of the future dividend payments. The model provides a means of developing an explicit expected return for the market. Since shares are valued on the actual cash flows received by the investors, it is theoretically the correct valuation model. Under this model, the price a share will be traded is calculated by the net present value of all expected future dividend payment discounted by an appropriate risk-adjusted rate. This dividend discount model price is the intrinsic value of the stock. If the stock pays no dividend, then the expected future cash flows is the sale price of the stock. The security with a greater risk must potentially pay a greater rate of return to induce investors to buy the security. The required rate of return (capitalization rate) is the rate of return required by investors to compensate them for the risk of owning the security. This capitalization rate can be used to price a stock as the sum of its present values of its future cash flows in the same way that interest rates are used to price bonds in terms of its cash flows. The price of a bond is the sum of the present value of its future interest payments discounted by the market rate. Similarly, the dividend discount model (DDM, dividend valuation model, DVM) prices a stock by the sum of its future cash flows discounted by the required rate of return that an investor demands for the risk of owning the stock. Future cash flows include dividends and the sale price of the stock when it is sold. This DDM price is the intrinsic value of the stock. If the stock pays no dividend, then the expected future cash flow is the sale price of the stock.

Intrinsic Value = Sum of Present Value of Future Cash Flows

Intrinsic Value = Sum of Present Value of Dividends + Present Value of Stock Sale Price

4.26 Strategic Financial Management

$$\text{Stock Intrinsic Value} = \frac{D_1}{(1+k)^1} + \frac{D_2}{(1+k)^2} + \dots + \frac{D_n}{(1+k)^n} + \frac{P}{(1+k)^n}$$

P
=

Selling Price of Stock

D = Annual Dividend Payment

k = Capitalization Rate

n = Number of Years until Stock is Sold;

In the above equation, it is assumed that dividend is paid at the end of each year and that the stock is sold at the end of the nth year. This is done so that the capitalization rate (k) is an annual rate, since most rates of return are presented as annual rates. If the stock is never sold, then it is essentially perpetuity, and its price is equal to the sum of the present value of its dividends. Since the DDM considers the current sale price of the stock to be equal to its future cash flows, then it must also be true that the future sale price of the stock is equal to the sum of the cash flows subsequent to the sale discounted by the capitalization rate. In an efficient market, the market price of a stock is considered to be equal to the intrinsic value of the stock, where the capitalization rate is equal to the market capitalization rate, the average capitalization rate of all market participants.

There are 3 models used in the dividend discount model:

- a. **Zero-growth**, which assumes that all dividends paid by a stock remain the same.
 - b. **Constant-growth** model, which assumes that dividends grow by a specific percent annually.
 - c. **Variable-growth model**, which typically divides growth into 3 phases: a fast initial phase, then a slower transition phase that ultimately ends with a lower rate that is sustainable over a long period.
- a. **Zero-Growth Rate DDM:** Since the zero-growth model assumes that the dividend always stays the same, the stock price would be equal to the annual dividends divided by the required rate of return.

Stock's Intrinsic Value = Annual Dividends / Required Rate of Return

This is basically the same formula used to calculate the value of a perpetuity, which is a bond that never matures, and can be used to price preferred stock, which pays a dividend that is a specified percentage of its par value. A stock based on the zero-growth model can still change in price if the capitalization rate changes, as it will if perceived risk changes, for instance, if a share pays dividend of 1.80 per year, and the required rate of return for the stock is 8%, then its intrinsic value is

Intrinsic Value of Stock = $1.80/0.08 = ₹ 22.50$.

b. Constant-Growth Rate DDM (Gordon Growth Model): The constant-growth DDM (Gordon Growth model, because it was popularized by Myron J. Gordon) assumes that dividends grow by a specific percentage each year, and is usually denoted as g , and the capitalization rate is denoted by k .

Constant-Growth Rate DDM Formula

$$\text{Intrinsic Value} = \frac{D_1}{k-g}$$

D_1 = Next Year's Dividend

k = Capitalization Rate

g = Dividend Growth Rate

The constant-growth model is often used to value stocks of mature companies that have increased the dividend steadily over the years. Although the annual increase is not always the same, the constant-growth model can be used to approximate an intrinsic value of the stock using the average of the dividend growth and projecting that average to future dividend increases. If both the capitalization rate and dividend growth rate remains the same every year, then the denominator doesn't change, so the stock's intrinsic value will increase annually by the percentage of the dividend increase. In other words, both the stock price and the dividend amount will increase by the constant-growth factor, g .

Illustration 13

Calculating Next Year's Stock Price Using the Constant-Growth DDM

If a stock pays a ₹ 4 dividend this year, and the dividend has been growing 6% annually, then what will be the price of the stock next year, assuming a required rate of return of 12%?

Solution

Next Year's Stock Price = $4 \times 1.06 / (12\% - 6\%) = 4.24 / 0.06 = 70.67$

This Year's Stock Price = $4 / 0.06 = ₹ 66.67$

Growth Rate of Stock Price = $70.67 / 66.67 = 1.06 = \text{Dividend Growth Rate}$

Note that both the zero-growth rate and the constant-growth rate dividend discount models both value stocks in terms of the dividends they pay and not on any capital gains in the stock price; the holding period for the stock is irrelevant; therefore the holding period return is equal either to the dividend rate of the zero-growth model or the constant-growth rate.

Discounted Cash Flow Formula

From the constant-growth dividend discount model, we can infer the market capitalization rate, k , or the rate of return demanded by investors.

Expected Return = Dividend Yield + Capital Gains Yield

If a stock is held for 1 year, and is bought and sold for its intrinsic value, then the following discounted cash flow formula calculates the market capitalization rate:

4.28 Strategic Financial Management

$$\begin{aligned}\text{Capitalization Rate (k)} &= \text{Dividend Yield} + \text{Capital Gain Yield} \\ &= \frac{D_1}{P_0} + \frac{P_1 - P_0}{P_0} \\ &= \frac{D_1}{P_0} + \frac{P_0(1 + g) - P_0}{P_0} \\ &= \frac{D_1}{P_0} + g\end{aligned}$$

k = Capitalization Rate

D₁ = Next Year's Dividend

P₀ = This Year's Stock Price

P₁ = Next Year's Stock Price

g = Dividend Growth Rate

Often, this is how rates are determined for public utilities by the agencies responsible for setting public rates. Public utilities are generally allowed to charge rates that cover their costs plus a fair market return, with the fair market return being the market capitalization rate.

Implied Growth Rate and Return on Equity: The constant-growth rate DDM formula can also be algebraically transformed, by setting the intrinsic value equal to the current stock price, to calculate the implied growth rate, then using the result to calculate the implied return on equity.

Implied Growth Rate Formula

$$\text{Implied Growth Rate (g)} = k - \frac{D_1}{P}$$

D₁ = Next Year's Dividend

k = Capitalization Rate

P = Current Stock Price

Implied Return on Equity Formula

$$\text{Implied Return on Equity} = \frac{\text{Implied Growth Rate}}{\text{Earnings Retention Rate}}$$

Illustration 14

Calculate the Implied Growth Rate and Return on Equity

Current Stock Price = ₹ 65

Next Year's Dividend = ₹ 4

Capitalization Rate = 12%

Earnings Retention Rate = 50%

Solution

Implied Growth Rate = $0.12 - 4/65 \approx 5.85\%$

Implied Return on Equity = $5.85/50 = 11.7\%$

c. Variable-Growth Rate DDM: Variable-growth rate models (multi-stage growth models) can take many forms, even assuming the growth rate is different for every year. However, the most common form is one that assumes 3 different rates of growth: an initial high rate of growth, a transition to slower growth, and lastly, a sustainable, steady rate of growth. Basically, the constant-growth rate model is extended, with each phase of growth calculated using the constant-growth method, but using 3 different growth rates of the 3 phases. The present values of each stage are added together to derive the intrinsic value of the stock.

Sometimes, even the capitalization rate, or the required rate of return, may be varied if changes in the rate are projected.

Conclusion: The dividend discount model is a useful heuristic model that relates the present stock price to the present value of its future cash flows in the same way that a bond is priced in terms of its future cash flows. However, bond pricing is a more exact science, especially if the bond is held to maturity, since its cash flows and the interest rate of those cash flows are known with certainty, unless the bond issuer defaults. The dividend discount model, however, depends on projections about company growth rate and future capitalization rates of the remaining cash flows. For instance, in a bear market, the capitalization rate will be higher than in a bull market—investors will demand a higher required rate of return to compensate them for a perceived greater amount of risk. Getting either the capitalization rate or the growth rate wrong will yield an incorrect intrinsic value for the stock, especially since even small changes in either of these factors will greatly affect the calculated intrinsic value. Furthermore, the greater the length of time considered, the more likely both factors will be wrong. Hence, the true intrinsic value of a stock is unknowable, and, thus, it cannot be determined whether a stock is undervalued or overvalued based on a calculated intrinsic value, since different investors will have different opinion about the company's future.

So while it is obvious that stocks are priced according to the market's expectations of future cash flows from owning the stock, both as to dividends and future stock price, there is no way to ascertain exactly what that true intrinsic value is.

FINAL COURSE STUDY MATERIAL

PAPER 2

STRATEGIC FINANCIAL MANAGEMENT

MODULE – 2



BOARD OF STUDIES
THE INSTITUTE OF CHARTERED ACCOUNTANTS OF INDIA

This Study Material has been prepared by the faculty of the Board of Studies. The objective of the Study Material is to provide teaching material to the students to enable them to obtain knowledge and skills in the subject. In case students need any clarifications or have any suggestions to make for further improvement of the material contained herein, they may write to the Director of Studies.

All care has been taken to provide interpretations and discussions in a manner useful for the students. However, the Study Material has not been specifically discussed by the Council of the Institute or any of its Committees and the views expressed herein may not be taken to necessarily represent the views of the Council or any of its Committees.

Permission of the Institute is essential for reproduction of any portion of this material.

© THE INSTITUTE OF CHARTERED ACCOUNTANTS OF INDIA

All rights reserved. No part of this book may be reproduced, stored in retrieval system, or transmitted, in any form, or by any means, electronic, mechanical, photocopying, recording, or otherwise, without prior permission in writing from the publisher.

Revised Edition : January, 2015

Website : www.icaai.org

Department/
Committee : Board of Studies

E-mail : bosnoida@icaai.in

ISBN No. :

Price :

Published by : The Publication Department on behalf of The Institute of Chartered Accountants of India, ICAI Bhawan, Post Box No. 7100, Indraprastha Marg, New Delhi-110 002, India.

Typeset and designed at Board of Studies.

Printed by :

CONTENTS

MODULE-1

Chapter 1 – Financial Policy and Corporate Strategy

Chapter 2 – Project Planning and Capital Budgeting

Chapter 3 – Leasing Decisions

Chapter 4 – Dividend Decisions

MODULE-2

Chapter 5 – Indian Capital Market

Chapter 6 – Security Analysis

Chapter 7 - Portfolio Theory

Chapter 8 – Financial Services In India

Chapter 9 – Mutual Funds

Chapter 10 – Money Market Operations

MODULE-3

Chapter 11 – Foreign Direct Investment (FDI), Foreign Institutional Investment (FIIS) and International Financial Management

Chapter 12 – Foreign Exchange Exposure and Risk Management

Chapter 13 – Mergers, Acquisitions & Restructuring

DETAILED CONTENTS: MODULE – 2

CHAPTER 5 – INDIAN CAPITAL MARKET

1.	Overview of Indian Financial System.....	5.1
2.	Capital Markets/Securities Market.....	5.2
3.	Participants in Capital Market.....	5.4
4.	Stock Market and its Operations	5.5
5.	Settlement and Settlement Cycles	5.10
6.	Clearing Houses	5.10
7.	IPO through Stock Exchange On-line System (E-IPO)	5.11
8.	Capital Market Instruments	5.12
9.	Introduction to Commodity Derivatives	5.53
10.	Necessary Conditions to Introduce Commodity Derivatives.....	5.54
11.	The Indian Scenario.....	5.55
12.	Investing in Commodity Derivatives	5.57
13.	Commodity Market.....	5.59
14.	Commodity Futures.....	5.60
15.	Commodity Swaps	5.61
16.	Hedging with Commodity Derivatives	5.62
17.	Introduction to OTC Derivatives	5.63
18.	OTC Interest Rate Derivatives	5.63
19.	Forward Rate Agreements	5.64
20.	Interest Rate Swaps.....	5.65
21.	Swaptions	5.70
22.	Interest Rate Caps	5.73

23.	Interest Rate Floors	5.75
24.	Interest Rate Collars	5.77
25.	Caps and Floors Versus Swaptions.....	5.79
26.	The Indian Scenario.....	5.79
27.	Minimum Public Shareholding requirements for listed companies	5.80
28.	Collective Investment Schemes	5.82
29.	Real Estate Investment Trust	5.83
30.	Infrastructure Investment Trust	5.86
31.	Introduction of Derivatives on VIX.....	5.87
32.	Algorithmic Trading.....	5.88
33.	Co-location/ Proximity Hosting	5.89
34.	High Frequency Trading.....	5.89
35.	Shift towards FPI regime.....	5.90
CHAPTER 6 – SECURITY ANALYSIS		
1.	Introduction	6.2
2.	Fundamental Analysis.....	6.2
3.	Technical Analysis	6.12
4.	Bond Valuation	6.26
CHAPTER 7 - PORTFOLIO THEORY		
1.	Introduction.....	7.2
2.	Phases of Portfolio Management	7.3
3.	Portfolio Theories	7.5
4.	Risk Analysis	7.7
5.	Markowitz Model of Risk-Return Optimization	7.25
6.	Capital Asset Pricing Model (CAPM)	7.28
7.	Arbitrage Pricing Theory Model (APT).....	7.35

8.	Sharpe Index Model	7.36
9.	Formulation of Portfolio Strategy	7.43
10.	Portfolio Rebalancing	7.46
11.	Tax Efficient Strategies for Taxable Portfolios	7.49
12.	Asset Allocation Strategies	7.50
13.	Principles and Management of Hedge Funds	7.50
14.	International Portfolio Management	7.61
15.	Estimating the Project Discount Rate	7.63
16.	Random Walk Theory.....	7.66
17.	Efficient Market Theory.....	7.66

CHAPTER 8 – FINANCIAL SERVICES IN INDIA

1.	Investment Banking.....	8.2
2.	Credit Rating	8.12
3.	Consumer Finance.....	8.18
4.	Factoring.....	8.21
5.	Housing Finance	8.26
6.	Asset Restructuring/Management Company	8.30
7.	Depository Services	8.31
8.	Debit Cards	8.34
9.	Online Share Trading	8.35

CHAPTER 9 – MUTUAL FUNDS

1.	Introduction	9.2
2.	Classification of Mutual Funds	9.4
3.	Types of Schemes	9.7
4.	Key players in Mutual Funds	9.10
5.	Advantages of Mutual Fund	9.12

6.	Drawbacks of Mutual Fund	9.13
7.	Evaluating performance of Mutual Funds	9.14
8.	The criteria for evaluating the performance	9.19
9.	Factors influencing the selection of Mutual Funds	9.22
10.	Signals highlighting the exit of the investor from the Mutual Fund Scheme	9.23
11.	Money Market Mutual Funds (MMMFS).....	9.23
12.	Exchange Traded Funds	9.24

CHAPTER 10 – MONEY MARKET OPERATIONS

1.	Introduction.....	10.2
2.	Institutions	10.9
3.	Instruments.....	10.10
4.	Determination of Interest Rates.....	10.23
5.	Recent Development in Money Market.....	10.24

Indian Capital Market

Learning Objectives

After going through the chapter student will be able to understand:

- Overview of Indian Financial System
- Capital Markets/ Securities Markets
- Various Capital Market Instruments
- Commodity Derivatives including hedging with Commodity Derivatives
- OTC Derivatives including FRAs, Interest Rate Swaps, Swaptions and Interest Rate Collars and Caps.

Part A: Indian Capital Market

1. Overview of Indian Financial System

Efficient financial systems are indispensable for speedy economic development. The more vibrant and efficient the financial system in a country is, the greater is its efficiency of capital formation. If the institutional structure of the financial system is diversified and broad based, the financial system will be more active and vibrant.

The overall macro level policies of the government, scope of services and operations of financial intermediaries, global outlook regarding the economy, diversity in investment avenues, income and saving levels of households and business and overall regulatory setup affect the process of capital formation in the country. They facilitate conversion of savings into investments by overcoming the geographical and technical limitations.

Classifications of Indian Financial Market

- (a) **On the basis of period of the investment avenues:** On the basis of the above criteria, financial market can be bifurcated among Capital Market and Money Market.

Money market is the market wherein short term instruments i.e. instruments which have a maturity period of less than 365 days (less than 1 year) traded. The common instruments available in the money market are Treasury Bills, Commercial Papers, Certificate of Deposits, Repurchase agreements and other instruments which have a maturity period of less than one year.

5.2 Strategic Financial Management

Conversely, capital markets are used for long-term assets, which are any assets with maturity tenor greater than one year. Capital markets include equity (stock) and debt (bond) market.

(b) On the basis of regulatory architecture: From the view point of regulatory set up the Indian financial system can be classified in the following categories:

- Banking Sector regulated by Reserve Bank of India (RBI)
- Securities Market regulated by Securities & Exchange Board of India (SEBI)
- Commodities Market regulated by Forward Market Commission (FMC)
- Pension Schemes regulated by Pension Fund Regulatory Authority of India (PFRDA)
- Insurance Sector regulated by Insurance Regulatory and Development Authority of India (IRDA)

2. Basics of Capital Markets (Need, Evolution and Constituents)

Capital markets are financial markets for the buying and selling of long-term debt or equity backed securities. The primary role of the capital market is to raise long-term funds for governments, banks, and corporations while providing a platform for the trading of securities. This fundraising is regulated by the performance of the stock and bond markets within the capital market. The member organizations of the capital market may issue stocks and bonds in order to raise funds. Investors can then invest in the capital market by purchasing those stocks and bonds. The capital market, therefore, functions as a link between savers and investors. It plays an important role in mobilizing the savings and diverting them in productive investment. In this way, capital market plays a vital role in transferring the financial resources from surplus and wasteful areas to deficit and productive areas, thus increasing the productivity and prosperity of the country and promotes the process of economic growth in the country.

Financial market regulators, such as the Securities Exchange Board of India (SEBI) and The Securities and Exchange Commission (SEC) in US oversee the capital markets in their jurisdictions to protect investors against fraud, among other duties.

Capital market is the heart of any economy through which the savings are channelized into effective long-term investments. A developed and vibrant Capital Market will immensely contribute towards speedy economic growth and development. A well-developed Capital market is beneficial both for the investor as well as for the corporate sector and it is the most important parameter for evaluating the health of any economy. It is an engine for economic growth, providing an efficient means of resource mobilization and allocation.

The Indian capital market is one of the oldest capital markets in the world. It dates back to the 18th century when the securities of the East India Company were traded in Mumbai and Kolkata. However, the orderly growth of the capital market began with the setting up of The Stock Exchange of Bombay in July 1875 and Ahmedabad Stock Exchange in 1884.

Eventually, 19 other Stock Exchanges sprang up in various parts of the country. The evolution-cum development of Indian capital market may be reviewed under two phases:

- (i) Indian Capital Market – Before 1990's
- (ii) Indian Capital Market – After 1990's

2.1 Indian Capital Market – Before 1990's: India's Capital Market was dormant till the mid – 1980's. The long term financing needs of the corporate sector were met by the Development Financial Institutions (DFI's) namely IDBI, IFCI, ICICI as well as by other investment institutions like LIC, UTI, GIC etc. Working capital needs were met by the Commercial Banks through an elaborate network of bank branches spread all over the country. Capital Market activities were limited, mainly due to the easy availability of loans from banks and financial institutions and administered structure of interest rates. However, three important legislations, namely, Capital Issues (Control) Act 1947, Securities Contracts (Regulation) Act, 1956, and Companies Act, 1956 (Now, Companies Act, 2013) were enacted to provide suitable legal framework for the development of capital market in India. The pricing of the primary issues was decided by the Office of the Controller of Capital Issues. A few stock exchanges, dominated by Bombay Stock Exchange (BSE), provided the trading platforms for the secondary market transactions under an open outcry system.

2.2 Indian Capital Market – After 1990's: The Indian capital markets have witnessed a major transformation and structural change during the past two and a half decades, since the early 1990's. The Financial Sector Reforms in general and the Capital Market Reforms in particular were initiated in India in a big way from 1991 – 1992 onward. These reforms have been aimed at improving market efficiency, enhancing transparency, checking unfair trade practices and bringing the Indian capital market up to the International Standards. The Capital Issues (Control) Act, 1947 was repealed in May 1992, and the office of the Controller of Capital Issues was abolished in the same year. The National Stock Exchange (NSE) was incorporated in 1992 and was given recognition as a Stock Exchange in April 1993. It has been playing a lead role as a change agent in transforming the Indian Capital Market to its present form.

The Securities and Exchange Board of India (SEBI) was set up in 1988 and acquired the statutory status in 1992. Since 1992, SEBI has emerged as an autonomous and independent statutory body with definite mandate such as: (a) to protect the interests of investors in securities, (b) to promote the development of securities market, and (c) to regulate the securities market. In order to achieve these objectives, SEBI has been exercising power under: (a) Securities and Exchange Board of India Act, 1992, (b) Securities Contracts (Regulation) Act, 1956, (c) Depositories Act, 1996 and delegated powers under the (d) Companies Act, 2013. Indian Capital Market has made commendable progress since the inception of SEBI and has been transformed into one of the most dynamic capital markets of the world.

5.4 Strategic Financial Management

2.3 Functions of the capital market: The major functions of capital market are:

1. To mobilize resources for investments.
2. To facilitate buying and selling of securities.
3. To facilitate the process of efficient price discovery.
4. To facilitate settlement of transactions in accordance with the predetermined time schedules.

2.4 Major constituents of the capital market

1. SEBI (Regulator)
2. Stock Exchanges
3. Clearing Corporations (CCs)/ Clearing Houses (CHs)
4. Depositories and depository participants
5. Custodians
6. Stock-brokers and their Sub-Brokers
7. Mutual Funds
8. Merchant Bankers
9. Credit Rating Agencies
10. Financial Institutions
11. Foreign Institutional Investors
12. Non-banking Institutions
13. Issuers/ Registrar and Transfer Agents
14. Investors

3. Segments of Capital Markets

The capital markets are relatively long term (greater than one-year maturity) financial instruments (e.g. bonds and stocks). Their role can be summarized as follows:

- (a) The Capital Market is the indicator of the inherent strength of the economy.
- (b) It is the largest source of funds with long and indefinite maturity for companies and thereby enhances the capital formation in the country.
- (c) It offers a number of investment avenues to investors.
- (d) It helps in channeling the savings pool in the economy towards optimal allocation of capital in the country.

The securities / capital market is divided into two parts, namely, primary and secondary stock market. The relationship between these parts of the markets provides an insight into its organization.

3.1 Primary Market: A market where new securities are bought and sold for the first time is called the New Issues market or the IPO market. In other words, the first public offering of equity shares or convertible securities by a company, which is followed by the listing of a company's shares on a stock exchange, is known as an initial public offering (IPO). The Primary market also includes issue of further capital by companies whose shares are already listed on the stock exchange.

3.2 Secondary Market: A market in which an investor purchases a security from another investor rather than the issuer, subsequent to the original issuance in the primary market. So, it can be stated that secondary markets are the stock exchanges and the over-the-counter market. When the securities are transferred from one holder to another, that trading is said to be in secondary market.

3.3 Differences between Primary and Secondary Market

Basis	Primary Market	Secondary Market
Nature of Securities	The primary market deal with new securities, that is, securities, which were not previously available and are, therefore, offered to the investing public for the first time	The secondary market is a market for old securities, i.e. securities which have been issued already and granted stock exchange quotation. The stock exchanges, therefore, provide a regular and continuous market for buying and selling of securities.
Nature of financing	Primary market provides additional funds to the issuing companies either for starting a new enterprise or for the expansion or diversification of the existing one and, therefore, its contribution to company financing is direct.	The secondary market can in no circumstance supply additional funds since the company is not involved in the transaction. This, however, does not mean that the stock markets do not have relevance in the process of transfer of resources from savers to investors. Their role regarding the supply of capital is indirect. The existence of secondary markets provides institutional facilities for the continuous purchase and sale of securities and lends liquidity and marketability thus, playing an important part in the process.

5.6 Strategic Financial Management

Organisational Differences	Primary market is not rooted in any particular spot and has no geographical existence. The primary market has neither any tangible form of any administrative organizational setup like that of stock exchanges, nor is it subjected to any centralized control and administration for the consummation of its business. It is recognized only by the services that it renders to the issuer of the securities and investor of the securities.	Secondary Markets have physical existence in the form of stock exchanges located in a particular geographical area.
-----------------------------------	--	---

3.4 Similarities between Primary and Secondary Market: Some of the similarities between them are follows:

(a) **Listing:** The securities issued in the primary market are invariably listed on a recognized stock exchange for dealings in them. Further trading in secondary market can also be carried out only via a stock exchange platform. The listing on stock exchanges provides liquidity as well as marketability to the securities and facilitates discovery of prices for them.

(b) **Control By Stock Exchanges:** Via the mechanism of Listing Agreement between the issuer companies and the stock exchange the stock exchanges exercise considerable control over the new issues as well securities already listed on the stock exchange. Exchanges ensure that there is continuous compliance by the issuer company of the clauses provided in the Listing Agreement.

3.5 Interrelationship between Primary Markets and Secondary Markets: The markets for new and old securities are, economically, an integral part of a single market – the capital market. Their mutual interdependence from the economic point of view has following two dimensions.

- One, the quantum of trading and the participation of the investors in stock exchange i.e. in secondary market has a significant bearing on the level of activity in the primary market and, therefore, its responses to capital issues.
- Secondly, dimension of the mutual interdependence is the fact that the level of activity in primary market has a direct impact on the level of activity in secondary market. As more and more companies issue their securities in the market, investment options for investors increase which leads to a wider participation by investors in the secondary market

4. Participants in Capital Market

- **Investors:** Investors are the lifeline of any capital markets. A vibrant capital market the capital market should be capable enough to attract the savings of investors. Investors

belong to various categories such as Retail Investors, Institutional Investors like mutual funds, insurance companies and Foreign Portfolio Investors.

- **Stock Exchange:** Stock Exchange is a place where securities issued by issuer companies are listed and traded. The term is synonymously used for secondary market.
- **Depository:** A depository is an organisation which holds securities (like shares, debentures, bonds, government securities, mutual fund units etc.) of investors in electronic form at the request of the investors through a registered Depository Participant. It also provides services related to transactions in securities. In India there are two depositories namely National Securities Depository Limited (NSDL) and Central Depository Services (India) Limited (CDSL).
- **Intermediaries:** Intermediaries are those entities which offer various services in relation to the capital markets. There are various categories of intermediaries such as stock brokers, merchant bankers, underwriters etc.

5. Stock Market and its Operations

The stock exchanges are meant to facilitate mobilisation of resources by companies. Their effective regulation is required for protecting the interests of investors and safeguarding their developmental role.

The Securities Contracts (Regulation) Act 1956 along with the Securities Contracts (Regulation) Rules 1957 has been the main laws to regulate the securities market in India. As per the Securities Contracts Regulations Act, 1956 a stock exchange is defined as "an association, organisation or body of individuals whether incorporated or not, established for the purpose of assisting, regulating and controlling business in buying, selling and dealing in securities". A look at the powers given stock exchanges in India to make and enforce by laws under the Act and the rules reveals that Indian Stock Exchanges have been envisaged as self regulatory organisations.

5.1 Growth of Stock Exchanges: The history of Stock Exchanges in India goes back to the eighteenth century, when securities of the East India Company were transacted. There were 50-60 brokers led by the legendary Premchand Roychand. They formed the backbone of share floatation by East India Company and a few commercial banks. Corporate shares made their entry in the 1830s and assumed significance with the enactment of the Companies Act in the 1850s. The Bombay Stock Exchange, the oldest stock exchange in India was established in 1875 under the name, Share and Stockbrokers Association.

The stock exchanges are tightly regulated as self-regulatory organizations (SROs) under the Act. In addition to ordinary regulatory powers over the stock exchanges, the Central Government and/or SEBI may nominate up to three members to the board of each stock exchange [Section 4(2) (iii) of the SC (R) Act, 1956 and Section 10 of SC(R) Rules, 1957]. The government and/or the agency have the authority to make, approve and amend the byelaws of the stock exchanges [Section 4(1)(a) & 8 of the SC(R) Act, 1956]. In return, the stock exchanges have been granted a strong disciplinary authority (as well as obligations) over their member stockbrokers.

5.8 Strategic Financial Management

5.1.1 Leading Stock Exchanges in India: The two leading stock exchanges in India are Bombay Stock Exchange (BSE) and National Stock Exchange (NSE). A brief about them is as under:

(a) Bombay Stock Exchange Limited: It is the oldest stock exchange in Asia and was established as "The Native Share & Stock Brokers Association" in 1875. It is the first stock exchange in the country to obtain permanent recognition in 1956 from the Government of India under the Securities Contracts (Regulation) Act, 1956. The Exchange's pivotal and pre-eminent role in the development of the Indian capital market is widely recognized and its index, *SENSEX*, is tracked worldwide. Earlier an Association of Persons (AOP), the Exchange is now a demutualised and corporatized entity incorporated under the provisions of the Companies Act, 1956, pursuant to the BSE (Corporatisation and Demutualisation) Scheme, 2005 notified by the Securities and Exchange Board of India (SEBI).

The Exchange has a nation-wide reach. The systems and processes of the Exchange are designed to safeguard market integrity and enhance transparency in operations.

The Exchange provides an efficient and transparent market for trading in equity, debt instruments and derivatives. The BSE's On Line Trading System (BOLT) is a proprietary system of the Exchange and is BS 7799-2-2002 certified. The surveillance and clearing & settlement functions of the Exchange are ISO 9001:2000 certified.

(b) National Stock Exchange: Report of the High Powered Study Group on Establishment of New Stock Exchanges, recommended promotion of a National Stock Exchange by financial institutions (FIs) to provide access to investors from all across the country on an equal footing. It was incorporated in November 1992 as a tax-paying company unlike other stock exchanges in the country.

On its recognition as a stock exchange under the Securities Contracts (Regulation) Act, 1956 in April 1993, NSE commenced operations in the Wholesale Debt Market (WDM) segment in June 1994. The Capital Market (Equities) segment commenced operations in November 1994 and operations in Derivatives segment commenced in June 2000.

It uses satellite communication technology to energise participation from around 320 cities spread all over the country. NSE can handle up to 6 million trades per day in Capital Market segment.

NSE is one of the largest interactive VSAT based stock exchanges in the world. It supports more than 3000 VSATs. The NSE- network is the largest private wide area network in the country and the first extended C- Band VSAT network in the world. Currently more than 9000 users are trading on the real time-online NSE application. There are over 15 large computer systems which include non-stop fault-tolerant computers and high end UNIX servers, operational under one roof to support the NSE applications. This coupled with the nation wide VSAT network makes NSE the country's largest Information Technology user.

5.1.2 Stock Exchanges Abroad: With the increasing globalisation and liberalization, the prices of securities on Indian stock exchanges are influenced by stock exchanges abroad. Under this heading we have tried to give a brief introduction of the major stock exchanges abroad.

(a) New York Stock Exchange (NYSE): The New York Stock Exchange was established more than 200 years ago in 1792. NYSE is the world's foremost securities marketplace.

Each day on the NYSE trading floor an auction takes place. Open bid and offers are managed on The Trading Floor by Exchange members acting on behalf of institutions and individual investors. Buy and sell orders for each listed security meet directly on the trading floor in assigned locations. Prices are determined through supply and demand. Stocks buy and sell orders funnel through a single location, ensuring that the investor, no matter how big or small, is exposed to a wide range of buyers and sellers.

(b) Nasdaq: Nasdaq is known for its growth, liquidity, depth of market and the world's most powerful, forward-looking technologies. All these make Nasdaq choice of the leading companies worldwide. Since its inception in 1971, Nasdaq has steadily outpaced the other major markets to become the fastest-growing stock market in the U.S. Nasdaq is a screen-based market, operating in an efficient, highly competitive electronic trading environment.

As the market for Nasdaq's largest and most actively traded securities, the Nasdaq National Market lists more than 4,000 securities. To be listed on the National Market, a company must satisfy stringent financial, capitalization, and corporate governance standards. Nasdaq National Market companies include some of the largest, best known companies in the world.

In contrast to traditional floor-based stock markets, Nasdaq has no single specialist through which transactions pass. Nasdaq's market structure allows multiple market participants to trade stock through a sophisticated computer network linking buyers and sellers from around the world. Together, these participants help ensure transparency and liquidity for a company's stock while maintaining an orderly market and functioning under tight regulatory controls.

(c) London Stock Exchange: Its history goes back to 1760 when 150 brokers kicked out of the Royal Exchange for rowdiness formed a club at Jonathan's Coffee House to buy and sell shares. In 1773, members voted to change the name to Stock Exchange and 2000 shareholders voted it to become a public limited company and thus London Stock Exchange plc was formed. Dealing in shares is conducted via an off-market trading facility operated by Cazenove and Co.

London Stock Exchange provides a range of services for companies and investors:

- (i) *Company Services* - It provides a number of markets which allow companies large and small to raise capital, and a range of services to increase the profile of the companies.
- (ii) *Trading Services* - It gives market users access to a well-developed trading environment with a proven record of stability and flexibility.
- (iii) *Information Services* - It provides high quality real-time price information to market users worldwide, as well as historical and reference data.

Supporting these activities, the exchange regulates the markets to give protection to investors and companies and to maintain its reputation for high standards and integrity. In addition, in partnership with others, it helps to track the performance of the markets through various indices.

5.10 Strategic Financial Management

5.2 Characteristics of Stock Exchanges in India: Traditionally, a stock exchange has been an association of individual members called member brokers (or simply members or brokers), formed for the express purpose of regulating and facilitating the buying and selling of securities by the public and institutions at large. A stock exchange in India operates with due recognition from the Government under the Securities & Contracts (Regulations) Act, 1956. Corporate membership of stock exchanges has also been introduced lately. As you know, there are at present 20 stock exchanges in India. The largest among them being the Bombay Stock Exchange which alone accounts for over 80% of the total volume of transactions in shares in the country.

A stock exchange is typically governed by a board, consisting of directors. Some Members of the Board are nominated by the Government. Government nominees include representatives of the Ministry of Finance, as well as some public representatives, who are expected to safeguard the interest of investors in the functioning of the exchanges. The board is headed by a President, who is an elected member, usually nominated by the government, from among the elected members. The Executive Director, who is appointed by the stock exchange with government approval, is the operational chief of the stock exchange. His duty is to ensure that the day-to-day operations of the stock exchange are carried out in accordance with the rules and regulations governing its functioning. Securities and Exchanges Board of India (SEBI) has been set up in Mumbai by the Government to oversee the orderly development of stock exchanges in the country. All companies wishing to raise capital from the public are required to list their securities on at least one stock exchange. Thus, all ordinary shares, preference shares and debentures of publicly held companies are listed in one or more stock exchanges. Stock exchanges also facilitate trading in the securities of the public sector companies as well as government securities.

5.3 Functions of Stock Exchanges: The Stock Exchange is a market place where investors buy and sell securities. Functions of the stock exchanges can be summarized as follows:

(a) Liquidity and Marketability of Securities: The basic function of the stock market is the creation of a continuous market for securities, enabling them to be liquidated, where investors can convert their securities into cash at any time at the prevailing market price. It also provides investors the opportunity to change their portfolio as and when they want to change, i.e. they can at any time sell one security and purchase another, thus giving them marketability.

(b) Fair Price Determination: This market is almost a perfectly competitive market as there are large number of buyers and sellers. Due to nearly perfect information, active bidding take place from both sides. This ensures the fair price to be determined by demand and supply forces.

(c) Source for Long term Funds: Corporates, Government and public bodies raise funds from the equity market. These securities are negotiable and transferable. They are traded and change hands from one investor to the other without affecting the long-term availability of funds to the issuing companies.

(d) Helps in Capital Formation: There is nexus between the savings and the investments of the community. The savings of the community are mobilized and channeled by stock exchanges for investment into those sectors and units which are favoured by the community at large, on the basis of such criteria as good return, appreciation of capital, and so on. It is the preference of investors for individual units as well as industry groups, which is reflected in the share price, that decides the mode of investment. Stock exchanges render this service by arranging for the preliminary distribution of new issues of capital, offered through prospectus, as also offers for sale of existing securities, in an orderly and systematic manner. They themselves administer the same, by ensuring that the various requisites of listing (such as offering at least the prescribed minimum percentage of capital to the public, keeping the subscription list open for a minimum period of days, making provision for receiving applications at least at the prescribed centres, allotting the shares against applications on a fair and unconditional basis) are duly complied with. Members of stock exchanges also assist in the flotation of new issues by acting (i) as brokers, in which capacity they, *inter alia*, try to procure subscription from investors spread all over the country, and (ii) as underwriters. Stock exchanges also provide a forum for trading in rights shares of companies already listed, thereby enabling a new class of investors to take up a part of the rights in the place of existing shareholders who renounce their rights for monetary considerations.

(e) Reflects the General State of Economy: The performance of the stock markets reflects the boom and depression in the economy. It indicates the general state of the economy to all those concerned, who can take suitable steps in time. The Government takes suitable monetary and fiscal steps depending upon the state of the economy.

5.4 Basics of Stock Market Indices

5.4.1 Stock Market Index: It is representative of the entire stock market. Movements of the index represent the average returns obtained by investors in the stock market. A base year is set along with a basket of base shares. The change in the market price of these shares is calculated on a daily basis. The shares included in the index are those shares which are traded regularly in high volume. In case the trading in any share stops or comes down then it gets excluded and another company's shares replaces it.

Each stock exchange has a flagship index like in India, Sensex of BSE and Nifty of NSE and outside India is Dow Jones, FTSE etc.

5.4.2 Concept behind Fluctuations of Index: Stocks are valued by discounting future earnings of a company; therefore, stock indices reflect expectation about future performance of the companies listed in the stock market or performance of the industrial sector. When the index goes up, the market thinks that the future returns will be higher than they are at present and vice versa.

Stock prices are sensitive to Company specific news and Country specific news (which includes budget, elections, government policies, wars and so on)

5.4.3 Computation of Index: Following steps are involved in calculation of index on a particular date:

5.12 Strategic Financial Management

- Calculate market capitalization of each individual company comprising the index.
- Calculate the total market capitalization by adding the individual market capitalization of all companies in the index.
- Computing index of next day requires the index value and the total market capitalization of the previous day and is computed as follows:

$$\text{Index Value} = \text{Index on Previous Day} \times \frac{\text{Total market capitalisation for current day}}{\text{Total capitalisation of the previous day}}$$

- It should also be noted that Indices may also be calculated using the price weighted method. Here the share price of the constituent companies form the weights. However, almost all equity indices world-wide are calculated using the market capitalization weighted method.

6. Settlement and Settlement Cycles

6.1 Rolling Settlement Cycle: SEBI introduced a new settlement cycle known as the 'rolling settlement cycle'. Rolling settlement is basically settlement of transaction in stock market in a certain number of days after the trade is agreed.

Rolling settlement has been explained with the help of following table:

Rolling Settlement

Activity	Description of Activities	Day	Timings
Trading	Trading by investors	T day	
Clearing	National Securities Clearing Corporation Ltd. (NSCCL) confirms the trade from stock exchange. Then, NSCCL process and download obligation files to brokers.	T + 1	By 1.30 P.M.
Settlement	Pay-in of securities and funds to NSCCL. NSCCL gives pay out of securities and funds.	T + 2	By 10.30 A.M. By 1.30 P.M.

The above chart has been explained in the following paragraphs:

Trading Day (T Day)

T stands for trading. Trading can be done during the entire day i.e. from 9.00 A.M. to 3.30 P.M. Trading can be done on any working day (except Saturday and Sunday and other holidays as intimated by the stock exchange from time to time). During the trading process,

one investor buys the shares and other investor purchases the shares. After the execution of trading, the buyer receives the shares and the seller receives money for the shares he parted.

Clearing Activities (T+1 day)

Clearing is a process of determination of obligations, after which obligations are discharged by settlement. On the T+1 day i.e. one day after the trading day, first of all, the National Securities Clearing Corporation Ltd. (NSCCL) confirms the trade executed during the day from the Stock Exchange which helps it to determine the obligation of each member (broker) in terms of funds and securities. After that, the netting of obligations is done. This entire process of determining the obligation is done by the custodians/clearing corporation which works under the NSCCL. Once the netting of obligation is done, all the files are processed and downloaded so that each broker knows what he has to pay-in and receive.

Netting explained

Suppose, an investor buys 100 shares @ ₹ 2000 each on Monday and sell those shares @ 2500 each on the same day. His net obligation in terms of funds and securities will be calculated on Tuesday. In terms of securities, his net obligation is nil as he has sold all the shares he bought. So, he will neither receive nor give any security. On the other hand, his net monetary obligations will be calculated taking into account his buying and selling amount. In this case, the net amount he is receiving is ₹ 50000 (100 shares x ₹ 2500 – 100 shares x ₹ 2000). This pay-in and pay-out of funds are calculated on T+2 day i.e. on Wednesday.

Settlement Activities (T+2 Day)

On the second working day i.e. T+2 day, all the brokers has to pay-in the required funds and securities to the NSCCL by 10.30 A.M. giving the required instructions to the respective clearing banks and members on the same day. Moreover, by 1.30 on the same day, brokers get the required funds through the NSCCL. This is called pay-out of funds.

Pay-in and pay-out of funds explained

Pay-in of funds take place when NSCCL gives the required funds to the clearing corporation by giving instructions to the clearing bank which credits the account of clearing corporation and debit the accounts of clearing bank. This is called pay-in of funds. After that, the NSCCL gives electronic instructions to the clearing banks to credit accounts of clearing members and debit accounts of the clearing corporation. This is called pay-out of funds and this completes the settlement cycle.

Pay-in and pay-out of securities explained

Pay-in of securities means that shares that the shareholder wants to sell are picked up from their Demat account and transferred to the broker's account. All these shares are then delivered to the clearing corporation. In pay-out of securities, the shares that the investor wants to buy are received from the clearing corporation and then transferred to the broker's

5.14 Strategic Financial Management

account. After that, the shares are transferred from the broker's account to the buyer's demat account.

6.2 Advantages of Rolling Settlements: In rolling settlements, payments are quicker than in weekly settlements. Thus, investors benefit from increased liquidity. From an investor's perspective, rolling settlement reduces delays. This also reduces the tendency for price trends to get exaggerated. Hence, investors not only get a better price but can also act at their leisure.

7. Clearing Houses

Clearing house is an exchange-associated body charged with the function of ensuring (guaranteeing) the financial integrity of each trade. Orders are cleared by means of the clearinghouse acting as the buyer to all sellers and the seller to all buyers. Clearing houses provide a range of services related to the guarantee of contracts, clearance and settlement of trades, and management of risk for their members and associated exchanges.

In April 1995, the NSE set up the National Securities Clearing Corporation Limited (NSCCL), its wholly owned subsidiary, to undertake clearing and settlement at the exchange. It started operations from April 1996. The NSCCL undertakes the counter party risk of each member and guarantees settlement. Settlement guarantee is a guarantee provided by the clearing corporation for the settlement of all trading of products in the stock exchange. The organizations linked with Clearing Corporation in the clearing and settlement process are discussed as below:

(a) Custodians/Clearing Members: NSCCL takes trading information from the exchange and pass the trade details to custodians/clearing members. Custodians confirm the obligations of the parties by netting.

(b) Clearing Banks: They act as a link between clearing corporation and clearing member. Every clearing member is required to maintain a clearing account with one of the clearing banks. A clearing bank has to enter into an agreement with the NSCCL and clearing member and open clearing account with the depository.

(c) Depositories: They hold securities in dematerialized form for the investors in their beneficiary account. Every clearing member is required to maintain a clearing pool account with the depositories.

The clearing banks, on receiving electronic instructions from the NSCCL, debit accounts of clearing banks and credit accounts of the clearing corporation. This is termed as pay-in of funds and securities. The NSCCL, after providing for shortages of funds and securities, sends electronic instructions to the depositories and clearing banks to credit accounts of clearing members and debit accounts of the clearing corporation. Thus, the settlement cycle is completed once the pay out of funds and securities is done.

7.1 Role of Clearing Houses

- It ensures adherence to the system and procedures for smooth trading.
- It minimises credit risks by being a counter party to all trades.
- It involves daily accounting of all gains or losses.
- It ensures delivery of payment for assets on the maturity dates for all outstanding contracts.
- It monitors the maintenance of speculation margins.

7.2 Working of Clearing House: The clearinghouse acts as the medium of transaction between the buyer and the seller. Every contract between a buyer and a seller is substituted by two contracts so that clearing house becomes the buyer to every seller and the seller to every buyer. In a transaction where P sells futures to R, R is replaced by the clearinghouse and the risk taken by P becomes insignificant. Similarly, the credit risk of R is taken over by the clearing house; thus, the credit risk is now assumed by the clearing house rather than by individuals. The credit risk of the clearing house is then minimised by employing some deposits as collaterals by both, buyers and sellers. These deposits, known as margins, are levied on each transaction depending upon the volatility of the instrument and adjusted everyday for price movements. Margins, which normally are in form of cash or T-bills, can be categorised into the following types: -

- **Initial Margins on Securities:** It is paid by purchasers and short sellers, generally function as a security for loan, and is similar to a down payment required for the purchase of a security.
- **Initial Margins on Derivatives:** It refers to funds paid as guarantee to ensure that the party to the transaction will perform its obligation under the contract. Initial margin on derivatives is designed to cover future changes that may occur in the value.
- **Maintenance Margins:** It refers to the value over and above the initial margin, which must be maintained in a margin account at all times after the initial margin requirement, if any, is satisfied.
- **Variation Margin:** It refers to funds that are required to be deposited in, or paid out of, a margin account that reflects changes in the value of the relevant instrument.

7.3 Trading Procedures: Clients have to open an account with a member of the exchange. When they want to trade in futures, they instruct members to execute orders in their account. The trade details are reported to the clearing house. If a member of the exchange is also a member of clearing house, then he directly deposits the margins with the clearing house. If he is not a member then he should route all transactions through a clearing member for maintaining margins.

8. IPO through Stock Exchange On-line System (e-IPO)

A company proposing to issue capital to public through the on-line system of the stock exchange for offer of securities has to comply with the additional requirements as given by

SEBI. They are applicable to the fixed price issue as well as for the fixed price portion of the book-built issues. The issuing company would have the option to issue securities to public either through the on-line system of the stock exchange or through the existing banking channel. For E-IPO the company should enter into agreement with the stock-exchange(s) and the stock exchange would appoint SEBI registered stockbrokers of the stock exchange to accept applications. The brokers and other intermediaries are required to maintain records of (a) orders received, (b) applications received, (c) details of allocation and allotment, (d) details of margin collected and refunded and (e) details of refund of application money.

Part B : Capital Market Instruments

9. Capital Market Instruments

In the following sections we will discuss some of the important capital market instruments including futures and options.

The capital markets are relatively for long term (greater than one year maturity) financial instruments (e.g. bonds and stocks). It is the largest source of funds with long and indefinite maturity for companies and thereby enhances the capital formation in the country. The following instruments are available for investors in the capital market:-

- Shares (Equity and preference)
- Debentures/ Bonds
- Depository Receipts (ADR's, GDR's and IDR's)
- Derivatives

Here, we will briefly go through the equity and preference shares, debentures, ADR and GDR and largely confine ourselves to different types of derivatives as they are one of the most complex and evolving instruments in the capital market.

9.1 Shares: Share is a type of security, which signifies ownership in a corporation and represents a claim on the part of the corporation's assets and earnings. It is a share in the ownership of a company. As one acquires more stock, his or her ownership stake in the company becomes greater.

There are two main types of shares, equity shares and preference shares. Equity share usually entitles the owner to vote at shareholders' meetings and to receive dividends. Preference shares generally do not have voting rights, but have a prior preference on assets and earnings of the company than the equity shares. For example, owners of Preference shares receive dividends before equity shareholders and have priority in the event of a company going bankrupt and is liquidated.

9.1.1 Basic Features of Shares:-

- (1) Being a shareholder of a public company does not mean you have a say in the day-to-day running of the business. Instead, one vote per share to elect the board of directors at annual meetings is the extent to which you have a say in the company.

- (2) Profits are sometimes paid out in the form of dividends. The more shares you own, the larger the portion of the profits you get. In case of bankruptcy and liquidation, you'll receive what's left after all the creditors have been paid.
- (3) Another extremely important feature of share is its limited liability, which means that, as an owner of a share, you are not personally liable if the company is not able to pay its debts. Other companies such as partnerships are set up so that if the partnership goes bankrupt the creditors can come after the partners (shareholders) personally and sell off their house, car, furniture, etc.
- (4) Companies issue shares to raise capital as it does not require the company to pay back the money after a certain time period (other than redeemable preference shares) or make interest payments continuously. Equity shares can be held by the company till perpetuity.
- (5) Equity shares are traded on the cash segment of the capital market. The investors in equity shares make money via dividends or through capital appreciation in the price of the shares. Equity shares are very high risk instruments with no guaranteed returns. There is always a risk of downside in the value of equity investments.
- (6) Shares are traded at market value on stock exchanges. Market Value per share is the current price at which the share is traded. For actively traded stocks (liquid stocks), market price quotations are readily available due to continuous demand and supply for those shares. However for inactive stocks (illiquid stocks) that have very thin markets, prices are very difficult to obtain. Even when obtainable, the information may reflect only the sale of a few shares and not typify the market value of the firm as a whole. Market value per share of an equity share is generally a function of the expectations of the market about the future earnings of the company and the perceived risk on the part of investors.

9.1.2 Issue Mechanism: The success of an issue depends, partly, on the issue mechanism. The methods by which new issues are made are: (i) Public issue through prospectus, (ii) Tender/Book building, (iii) Offer for sale (iv) Placements (v) Rights issue.

(i) Public Issue through Prospectus: Under this method, the issuing companies themselves offer directly to general public a fixed number of shares at a stated price, which in the case of new companies is invariably the face value of the securities, and in the case of existing companies, it may sometimes include a premium amount, if any. Another feature of public issue is that generally the issues are underwritten to ensure success arising out of unsatisfactory public response. Transparency and wide distribution of shares are its important advantages.

The foundation of the public issue method is a prospectus, the minimum contents of which are prescribed by the Companies Act, 1956. It also provides both civil and criminal liability for any misstatement in the prospectus. Additional disclosure requirements are also mandated by the SEBI.

5.18 Strategic Financial Management

A serious drawback of public issue, as a method to raise capital through the sale of securities, is that it is a highly expensive method. The cost of floatation involves underwriting expenses, brokerage, and other administrative expenses.

(ii) Tender / Book building: When a company plans for raising of funds from the market, the book building method is one such way to raise more funds. After accepting the free pricing mechanism by the SEBI, the Book building process has acquired too much significance and has opened a new lead in development of capital market.

A company can use the process of book building to fine tune its price of issue. When a company employs book building mechanism, it does not pre-determine the issue price (in case of equity shares) or interest rate (in case of debentures) and invite subscription to the issue. Instead it starts with an indicative price band (or interest band) which is determined through consultative process with its merchant banker and asks its merchant banker to invite bids from prospective investors at different prices (or different rates). Those who bid are required to pay the full amount. Based on the response received from investors the final price is selected. The merchant banker (called in this case Book Runner) has to manage the entire book building process. Investors who have bid a price equal to or more than the final price selected are given allotment at the final price selected. Those who have bid for a lower price will get their money refunded.

A company making an initial public offer of equity shares through the book-building mechanism can avail of the green shoe option (GSO) for stabilising the post-listing price of its shares. The GSO means an option of allocating shares in excess of the shares included in the public issue and operating a post listing price stabilising mechanism through a stabilising agent (SA). The concerned issuing company should seek authorisation for the possibility of allotment of further issues to the SA at the end of the stabilising period together with the authorisation for the public issue in the general meeting of its shareholders. It should appoint one of the lead book runners as the SA who would be responsible for price stabilisation process. The SA should enter into an agreement with the issuer company prior to the filing of the offer document with SEBI, clearly stating all the terms and conditions relating to GSO including fees charged/expenses to be incurred by him for this purpose. He should also enter into an agreement with the promoter(s) who would lend their shares, specifying the maximum number of shares that may be borrowed from their promoters. But in no case exceeding 15% of the total issue size. The details of these two agreements should be disclosed in the draft red herring prospectus, red herring prospectus and final prospectus.

To stabilise the post listing prices of the shares, the SA would determine the timing of buying them, the quantity to be bought, the prices at which to be bought and so on. In case the SA does not buy shares to the extent of their over allotment from the market, the issuer company should allot shares to the extent of the shortfall in dematerialised form to the GSO Demat account within 5 days of the closure of the stabilisation period. Those would be returned to the promoters by the SA in lieu of those borrowed from them and the GSO Demat account would be closed.

In an issue of securities to the public through a prospectus, the option for 100% book building is available to any issuer company. Reservation for firm allotment to the extent of the

percentage specified in the relevant SEBI guidelines can be made only to promoters, 'permanent employees of the issuer company and in the case of new company to the permanent employees of the promoting company'. It can also be made to shareholders of the promoting companies, in the case of new company and shareholders of group companies in the case of existing company either on a competitive basis or on a firm allotment basis. The issuer company should appoint eligible merchant bankers as book runner(s) and their names should be mentioned in the draft prospectus. The lead merchant banker should act as the lead book runner and the other eligible merchant bankers are termed as co-book runner.

The greatest advantage of the book building process are:

- (a) This allows for price and demand discovery.
- (b) The cost of issue is much less than the other traditional methods of raising capital.
- (c) In book building, the demand for shares is known before the issue closes. In fact, if there is not much demand, the issue may be deferred and can be rescheduled after having realized the situation of the market.

(iii) Offer for Sale: Another method by which securities can be issued is by means of an offer for sale. Under this method, instead of the issuing company itself offering its shares, directly to the public, it offers through the intermediary of issuing houses/merchant banks/investment banks or firms of stockbrokers. The modus operandi of the offer of sale is akin to the public issue method. Moreover, the issues are underwritten to avoid the possibility of the issue being left largely in the hands of the issuing houses. But the mechanism adopted is different. The sale of securities with an offer for sale method is done in two stages.

In the first stage, the issuing company sells the securities enbloc to the issuing houses or stockbrokers at an agreed fixed price and the securities, thus acquired by the sponsoring institutions, are resold, in the second stage, by the issuing houses to the ultimate investors. The securities are offered to the public at a price higher than the price at which they were acquired from the company. The difference between the sale and the purchase price, technically called as turn, represents the remuneration of the issuing houses.

Apart from being expensive, like the public issue method, it suffers from another serious shortcoming. The securities are sold to the investing public usually at a premium. The margin between the amount received by the company and the price paid by the public does not become additional funds, but it is pocketed by the issuing houses or the existing shareholders.

(iv) Placement Method: Yet another method to float new issues of capital is the placing method defined by London Stock Exchange as "sale by an issue house or broker to their own clients of securities which have been previously purchased or subscribed". Under this method, securities are acquired by the issuing houses, as in offer for sale method, but instead of being subsequently offered to the public, they are placed with the clients of the issuing houses, both individual and institutional investors. Each issuing house has a list of large private and institutional investors who are always prepared to subscribe to any securities which are issued in this manner. Its procedure is the same with the only difference of ultimate investors.

In this method, no formal underwriting of the issue is required as the placement itself amounts to underwriting since the issuing houses agree to place the issue with their clients.

5.20 Strategic Financial Management

The main advantage of placing, as a method issuing new securities, is its relative cheapness. There is a cost cutting on account of underwriting commission, expense relating to applications, allotment of shares and the stock exchange requirements relating to contents of the prospectus and its advertisement. This method is generally adopted by small companies with unsatisfactory financial performances.

Its weakness arises from the point of view of distribution of securities. As the securities are offered only to a select group of investors, it may lead to the concentration of shares into a few hands who may create artificial scarcity of scrips in times of hectic dealings in such shares in the market.

(v) Rights Issue: This method can be used only by the existing companies. In the case of companies whose shares are already listed and widely-held, shares can be offered to the existing shareholders. This is called rights issue. Under this method, the existing shareholders are offered the right to subscribe to new shares in proportion to the number of shares they already hold. This offer is made by circular to 'existing shareholders' only. The chief merit of right issue is that it is an inexpensive method.

9.1.2 Preference Shares: These shares form part of the share capital of the company which carry a preferential right to be paid in case a company goes bankrupt or is liquidated. They do not have voting rights but have a higher claim on the assets and earnings of the company. A preference share may also sometimes be convertible partly/fully into equity shares/debentures at a certain ratio during a specified period.

9.2 Debentures/ Bonds: A bond is a long-term debt security. It represents "debt" in that the bond buyer actually lends the face amount to the bond issuer. The certificate itself is evidence of a lender-creditor relationship. It is a "security" because unlike a car loan or home-improvement loan, the debt can be bought and sold in the open market. In fact, a bond is a loan intended to be bought and sold. Debt securities with maturities below one year are called bills, notes or other terms. Usually the bond have a duration of 5 years or more. Since bonds are intended to be bought and sold, all the certificates of a bond issue contain a master loan agreement. This agreement between issuer and investor (or creditor and lender), called the 'bond indenture' or "deed of trust," contains all the information you would normally expect to see in any loan agreement, including the following:

- **Amount of the Loan:** The "face amount" "par value" or "principal" is the amount of the loan - the amount that the bond issuer has agreed to repay at the bond's maturity.
- **Rate of Interest:** Bonds are issued with a specified "coupon" or "nominal" rate, which is determined largely by market conditions at the time of the bond's primary offering. Once determined, it is set contractually for the life of the bond. The amount of the interest payment can be easily calculated by multiplying the rate of interest (or coupon) by the face value of the bond. For instance, a bond with a face amount of ₹ 1000 and a coupon of 8% pays the bondholder ₹ 80 a year.
- **Schedule or Form of Interest Payments:** Interest is paid on most bonds at six-month intervals, usually on either the first or the fifteenth of the month. The ₹ 80 of annual

interest on the bond in the previous example would probably be paid in two installments of ₹ 40 each.

- **Term:** A bond's maturity or the length of time until the principal is repaid varies greatly but is always more than five years. Debt that matures in less than a year is a "money market instrument" - such as commercial paper or bankers' acceptances. A "short-term bond," on the other hand, may have an initial maturity of five years. A "long-term bond" typically matures in 20 to 40 years. The maturity of any bond is predetermined and stated in the trust indenture.
- **Call Feature (if any):** A "call feature," if specified in the trust indenture, allows the bond issuer to "call in" the bonds and repay them at a predetermined price before maturity. Bond issuers use this feature to protect themselves from paying more interest than they have to for the money they are borrowing. Companies call in bonds when general interest rates are lower than the coupon rate on the bond, thereby retiring expensive debt and refinancing it at a lower rate.

Suppose IDBI had issued 6 years ₹ 1000 bonds in 1998 @14% pa. But now the current interest rate is around 9% to 10%. If the issuer wants to take advantage of the call feature in the bond's indenture it will call back the earlier issued bonds and reissue them @9% p.a. The sale proceeds of this new issue will be used to pay the old debt. In this way IDBI now enjoys a lower cost for its borrowed money.

Some bonds offer "call protection"; that is, they are guaranteed not to be called for five to ten years. Call features can affect bond values by serving as a ceiling for prices. Investors are generally unwilling to pay more for a bond than its call price, because they are aware that the bond could be called at a lower call price. If the bond issuer exercises the option to call bonds, the bond holder is usually paid a premium over par for the inconvenience.

- **Refunding:** If, when bonds mature, the issuer does not have the cash on hand to repay bondholders; it can issue new bonds and use the proceeds either to redeem the older bonds or to exercise a call option. This process is called refunding.

Note: The valuation aspects of Bond/Debenture have been covered in forthcoming chapter of Security Analysis.

10. Derivatives

Derivative is a product whose value is to be derived from the value of one or more basic variables called bases (underlying assets, index or reference rate). The underlying assets can be Equity, Forex, and Commodity.

The underlying has a marketable value which is subject to market risks. The importance of underlying in derivative instruments is as follows:

- ❖ All derivative instruments are dependent on an underlying to have value.
- ❖ The change in value in a forward contract is broadly equal to the change in value in the underlying.

5.22 Strategic Financial Management

- ❖ In the absence of a valuable underlying asset the derivative instrument will have no value.
- ❖ On maturity, the position of profit/loss is determined by the price of underlying instruments. If the price of the underlying is higher than the contract price the buyer makes a profit. If the price is lower, the buyer suffers a loss.

Main users of Derivatives are as follows:

	Users	Purpose
(a)	Corporation	To hedge currency risk and inventory risk
(b)	Individual Investors	For speculation, hedging and yield enhancement.
(c)	Institutional Investor	For hedging asset allocation, yield enhancement and to avail arbitrage opportunities.
(d)	Dealers	For hedging position taking, exploiting inefficiencies and earning dealer spreads.

Before discussing the different derivatives, you should understand the various risks associated with them. The different types of derivative risks are:

- (a) **Credit risk:** Credit risk is the risk of loss due to counterparty's failure to perform on an obligation to the institution. Credit risk in derivative products comes in two forms:
 - (i) **Pre-settlement risk:** It is the risk of loss due to a counterparty defaulting on a contract during the life of a transaction. The level of exposure varies throughout the life of the contract and the extent of losses will only be known at the time of default.
 - (ii) **Settlement risk:** It is the risk of loss due to the counterparty's failure to perform on its obligation after an institution has performed on its obligation under a contract on the settlement date. Settlement risk frequently arises in international transactions because of time zone differences. This risk is only present in transactions that do not involve delivery versus payment and generally exists for a very short time (less than 24 hours).
- (b) **Market risk:** Market risk is the risk of loss due to adverse changes in the market value (the price) of an instrument or portfolio of instruments. Such exposure occurs with respect to derivative instruments when changes occur in market factors such as underlying interest rates, exchange rates, equity prices, and commodity prices or in the volatility of these factors.
- (c) **Liquidity risk:** Liquidity risk is the risk of loss due to failure of an institution to meet its funding requirements or to execute a transaction at a reasonable price. Institutions involved in derivatives activity face two types of liquidity risk : market liquidity risk and funding liquidity risk.

- (i) **Market liquidity risk:** It is the risk that an institution may not be able to exit or offset positions quickly, and in sufficient quantities, at a reasonable price. This inability may be due to inadequate market depth in certain products (e.g. exotic derivatives, long-dated options), market disruption, or inability of the bank to access the market (e.g. credit down-grading of the institution or of a major counterparty).
- (ii) **Funding liquidity risk:** It is the potential inability of the institution to meet funding requirements, because of cash flow mismatches, at a reasonable cost. Such funding requirements may arise from cash flow mismatches in swap books, exercise of options, and the implementation of dynamic hedging strategies.
- (d) **Operational risk:** Operational risk is the risk of loss occurring as a result of inadequate systems and control, deficiencies in information systems, human error, or management failure.
- (e) **Legal risk:** Legal risk is the risk of loss arising from contracts which are not legally enforceable (e.g. the counterparty does not have the power or authority to enter into a particular type of derivatives transaction) or documented correctly.
- (f) **Regulatory risk:** Regulatory risk is the risk of loss arising from failure to comply with regulatory or legal requirements.
- (g) **Reputation risk:** Reputation risk is the risk of loss arising from adverse public opinion and damage to reputation.

The basic differences between Cash and the Derivative market are enumerated below:-

- (a) In cash market tangible assets are traded whereas in derivative market contracts based on tangible or intangibles assets like index or rates are traded.
- (b) In cash market, we can purchase even one share whereas in Futures and Options minimum lots are fixed.
- (c) Cash market is more risky than Futures and Options segment because in "Futures and Options" risk is limited upto 20%.
- (d) Cash assets may be meant for consumption or investment. Derivative contracts are for hedging, arbitrage or speculation.
- (e) The value of derivative contract is always based on and linked to the underlying security. However, this linkage may not be on point-to-point basis.
- (f) In the cash market, a customer must open securities trading account with a securities depository whereas to trade futures a customer must open a future trading account with a derivative broker.

5.24 Strategic Financial Management

- (g) Buying securities in cash market involves putting up all the money upfront whereas buying futures simply involves putting up the margin money.
- (h) With the purchase of shares of the company in cash market, the holder becomes part owner of the company. While in future it does not happen.

The most important derivatives are forward, futures and options. Here we will discuss derivatives as financial derivatives and embedded derivatives.

10.1 Forward Contract: *Consider a Punjab farmer who grows wheat and has to sell it at a profit. The simplest and the traditional way for him is to harvest the crop in March or April and sell in the spot market then. However, in this way the farmer is exposing himself to risk of a downward movement in the price of wheat which may occur by the time the crop is ready for sale.*

In order to avoid this risk, one way could be that the farmer may sell his crop at an agreed-upon rate now with a promise to deliver the asset, i.e., crop at a pre-determined date in future. This will at least ensure to the farmer the input cost and a reasonable profit.

Thus, the farmer would sell wheat forward to secure himself against a possible loss in future. It is true that by this way he is also foreclosing upon him the possibility of a bumper profit in the event of wheat prices going up steeply. But then, more important is that the farmer has played safe and insured himself against any eventuality of closing down his source of livelihood altogether. The transaction which the farmer has entered into is called a **forward transaction** and the contract which covers such a transaction is called a **forward contract**.

A forward contract is an agreement between a buyer and a seller obligating the seller to deliver a specified asset of specified quality and quantity to the buyer on a specified date at a specified place and the buyer, in turn, is obligated to pay to the seller a pre-negotiated price in exchange of the delivery.

This means that in a forward contract, the contracting parties negotiate on, not only the price at which the commodity is to be delivered on a future date but also on what quality and quantity to be delivered and at what place. No part of the contract is standardized and the two parties sit across and work out each and every detail of the contract before signing it.

For example, in case a gold bullion forward contract is being negotiated between two parties, they would negotiate each of the following features of the contract:

- ❖ the weight of the gold bullion to be delivered,
- ❖ the fineness of the metal to be delivered,
- ❖ the place at which the delivery is to be made,
- ❖ the period after which the delivery is to be made, and
- ❖ the price which the buyer would pay.

Suppose a buyer L and a seller S agrees to do a trade in 100 tolas of gold on 31 Dec 2013 at ₹ 30,000/tola. Here, ₹ 30,000/tola is the 'forward price of 31 Dec 2013 Gold'. The buyer L is said to be long and the seller S is said to be short. Once the contract has been entered into, L

is obligated to pay S ₹ 30 lakhs on 31 Dec 2013, and take delivery of 100 tolas of gold. Similarly, S is obligated to be ready to accept ₹ 30 lakhs on 31 Dec 2013, and give 100 tolas of gold in exchange.

10.2 Future Contract: A futures contract is an agreement between two parties that commits one party to buy an underlying financial instrument (bond, stock or currency) or commodity (gold, soybean or natural gas) and one party to sell a financial instrument or commodity at a specific price at a future date. The agreement is completed at a specified expiration date by physical delivery or cash settlement or offset prior to the expiration date. In order to initiate a trade in futures contracts, the buyer and seller must put up "good faith money" in a margin account. Regulators, commodity exchanges and brokers doing business on commodity exchanges determine margin levels.

Suppose A buyer "B" and a Seller "S" enter into a 5,000 kgs corn futures contract at ₹ 5 per kg. Assuming that on the second day of trading the settlement price (settlement price is generally the representative price at which the contracts trade during the closing minutes of the trading period and this price is designated by a stock exchange as the settlement price). In case the price movement during the day is such that the price during the closing minutes is not the representative price, the stock exchange may select a price which it feels is close to being a representative price, e.g., average of the high and low prices which have occurred during a trading day) of March corn is ₹ 5.20 per kg. This price movement has led to a loss of ₹ 1,000 to S while B has gained the corresponding amount.

Thus, the initial margin account of S gets reduced by ₹ 1,000 and that of B is increased by the same amount. While the margin accounts, also called the equity of the buyer and the seller, get adjusted at the end of the day in keeping with the price movement, the futures contract gets replaced with a new one at a price which has been used to make adjustments to the buyer and seller's equity accounts. In this case, the settlement price is ₹ 5.20, which is the new price at which next day's trading would start for this particular futures contract. Thus, each future contract is rolled over to the next day at a new price. This is called marking-to-market.

Difference between forward and future contract is as follows:

S.No.	Features	Forward	Futures
1.	Trading	Forward contracts are traded on personal basis or on telephone or otherwise.	Futures Contracts are traded in a competitive arena.
2.	Size of Contract	Forward contracts are individually tailored and have no standardized size.	Futures contracts are standardized in terms of quantity or amount as the case may be.
3.	Organized exchanges	Forward contracts are traded in an over the counter market.	Futures contracts are traded on organized exchanges with a designated physical location.
4.	Settlement	Forward contracts settlement takes place on the date agreed	Futures contracts settlements are made daily via. Exchange's

5.26 Strategic Financial Management

		upon between the parties.	clearing house.
5.	Delivery date	Forward contracts may be delivered on the dates agreed upon and in terms of actual delivery.	Futures contracts delivery dates are fixed on cyclical basis and hardly takes place. However, it does not mean that there is no actual delivery.
6.	Transaction costs	Cost of forward contracts is based on bid – ask spread.	Futures contracts entail brokerage fees for buy and sell order.
7.	Marking to market	Forward contracts are not subject to marking to market.	Futures contracts are subject to marking to market in which the loss on profit is debited or credited in the margin account on daily basis due to change in price.
8.	Margins	Margins are not required in forward contract.	In futures contracts every participants is subject to maintain margin as decided by the exchange authorities.
9.	Credit risk	In forward contract, credit risk is born by each party and, therefore, every party has to bother for the creditworthiness.	In futures contracts the transaction is a two way transaction, hence the parties need not to bother for the risk.

10.3 Pricing/ Valuation of Forward/ Future Contracts: The difference between the prevailing spot price of an asset and the futures price is known as the basis, i.e.,

Basis = Spot price – Futures price

In a normal market, the spot price is less than the futures price (which includes the full cost-of-carry) and accordingly the basis would be negative. Such a market, in which the basis is decided solely by the cost-of-carry is known as a Contango market.

Basis can become positive, i.e., the spot price can exceed the futures price only if there are factors other than the cost of carry to influence the futures price. In case this happens, then basis becomes positive and the market under such circumstances is termed as a backwardation market or inverted market.

Basis will approach zero towards the expiry of the contract, i.e., the spot and futures prices converge as the date of expiry of the contract approaches. The process of the basis approaching zero is called convergence.

The relationship between futures prices and cash prices is determined by the cost-of-carry. However, there might be factors other than cost-of-carry, especially in stock futures in which

there may be various other returns like dividends, in addition to carrying costs, which may influence this relationship.

The cost-of-carry model in for futures, is as under:-

Future price = Spot price + Carrying cost – Returns (dividends, etc).

Let us take an example to understand this relationship.

Example

The price of ACC stock on 31 December 2010 was ₹ 220 and the futures price on the same stock on the same date, i.e., 31 December 2010 for March 2011 was ₹ 230. Other features of the contract and related information are as follows:

Time to expiration - 3 months (0.25 year)

Borrowing rate - 15% p.a.

Annual Dividend on the stock - 25% payable before 31.03. 2011

Face Value of the Stock - ₹ 10

Based on the above information, the futures price for ACC stock on 31 December 2010 should be:

$$= 220 + (220 \times 0.15 \times 0.25) - (0.25 \times 10) = 225.75$$

Thus, as per the 'cost of carry' criteria, the futures price is ₹ 225.75, which is less than the actual price of ₹ 230 on 31 March 2011. This would give rise to arbitrage opportunities and consequently the two prices will tend to converge.

How Will The Arbitrager Act?

He will buy the ACC stock at ₹ 220 by borrowing the amount @ 15 % for a period of 3 months and at the same time sell the March 2011 futures on ACC stock. By 31st March 2011, he will receive the dividend of ₹ 2.50 per share. On the expiry date of 31st March, he will deliver the ACC stock against the March futures contract sales.

The arbitrager's inflows/outflows are as follows:

Sale proceeds of March 2011 futures	₹ 230.00
Dividend	₹ <u>2.50</u>
Total (A)	₹ <u>232.50</u>
Pays back the Bank	₹ 220.00
Cost of borrowing	₹ <u>8.25</u>
Total (B)	₹ <u>228.25</u>
Balance (A) – (B)	₹ 4.25

Thus, the arbitrager earns ₹ 4.25 per share without involving any risk.

5.28 Strategic Financial Management

In financial forward contracts, the cost of carry is primarily the interest cost.

Let us take a very simple example of a fixed deposit in the bank. ₹ 100 deposited in the bank at a rate of interest of 10% would become ₹ 110 after one year. Based on annual compounding, the amount will become ₹ 121 after two years. Thus, we can say that the forward price of the fixed deposit of ₹ 100 is ₹ 110 after one year and ₹ 121 after two years.

As against the usual annual, semi-annual and quarterly compounding, which the reader is normally used to, continuous compounding are used in derivative securities. In terms of the annual compounding, the forward price can be computed through the following formula:

$$A = P (1+r/100)^t$$

Where, A is the terminal value of an amount P invested at a rate of interest of r % p.a. for t years.

However, in case there are multiple compounding in a year, say n times per annum, then the above formula will read as follows:

$$A = P (1+r/n)^{nt}$$

And in case the compounding becomes continuous, i.e., more than daily compounding, the above formula can be simplified mathematically and rewritten as follows:

$$A = P e^{r \cdot n}$$

Where 'e', called epsilon, is a mathematical constant and has a value of 2.72. This function is available in all mathematical calculators and is easy to handle.

The above formula gives the future value of an amount invested in a particular security now. In this formula, we have assumed no interim income flow like dividends etc

Example

Consider a 3 month maturity forward contract on a non-dividend paying stock. The stock is available for ₹ 200. With compounded continuously risk-free rate of interest (CCRRI) of 10 % per annum, the price of the forward contract would be:

$$A = 200 \times e^{(0.25)(0.10)} = ₹ 205.06$$

In case there is cash income accruing to the security like dividends, the above formula will read as follows:

$$A = (P-I)e^{nr}$$

Where I is the present value of the income flow during the tenure of the contract.

Example

Consider a 4 month forward contract on 500 shares with each share priced at ₹ 75. Dividend @ ₹ 2.50 per share is expected to accrue to the shares in a period of 3 months. The CCRRI is 10% p.a. The value of the forward contract is as follows:

$$\text{Dividend proceeds} = 500 \times 2.50 = 1250 = 1250e^{-(3/12)(0.10)} = 1219.13$$

$$\begin{aligned}
 \text{Value of forward contract} &= (500 \times 75 - 1219.13) e^{(4/12)(0.10)} \\
 &= 36280.87 \times e^{0.033} \\
 &= ₹ 37498.11
 \end{aligned}$$

However, in case the income accretion to the securities is in the form of percentage yield, y , as in the case of stock indices arising on account of dividend accruals to individual stocks constituting the index, the above formula will read as follows:

$$A = Pe^{n(r-y)}$$

Example

Consider the following:

Current value of index	-	1400
Dividend yield	-	6%
CCRR	-	10%

To find the value of a 3 month forward contract.

$$\begin{aligned}
 A &= Pe^{n(r-y)} \\
 &= 1400 \times e^{(3/12)(0.10 - .06)} = ₹ 1,414
 \end{aligned}$$

Correlation between Forward and Futures Prices

For contracts of the same maturity, the forward and futures contracts tend to have the same value subject to the interest rates remaining fixed. In case the interest rates are fluid, the value of a futures contract would differ from that of a forward contract because the cash flows generated from marking to the market in the case of the former would be available for reinvestment at variable rates on a day-to-day basis. However, market imperfections like transaction costs, taxes and asset indivisibilities bring futures prices close enough to the forward prices to safely assume the two prices to be practically the same.

10.4 Types of futures contracts

10.4.1 Single Stock Futures: A single stock futures contract is an agreement to buy or sell shares or stock such as Microsoft, Intel, ITC, or Tata Steel at a point in the future. The buyer has an obligation to purchase shares or stock and the seller has an obligation to sell shares or stock at a specific price at a specific date in the future. Thus a stock futures contract is a standardized contract to buy or sell a specific stock at a future date at an agreed price. Single-stock futures contracts are completed via offset or the delivery of actual shares at expiration. Margin on a single-stock futures contract is expected normally to be 20% of notional value.

Each Stock Future contract is standardized and includes basic specifications.

The terms of the contract call for delivery of the stock by the seller at some time specified in the future. However, most contracts are not held to expiration. The contracts are standardized, making them highly liquid. To get out of an open long (buying) position, the investor simply

5.30 Strategic Financial Management

takes an offsetting short position (sells). Conversely, if an investor has sold (short) a contract and wishes to close it out, he or she buys (goes long) the offsetting contract.

10.4.2 Index Futures: A contract for stock index futures is based on the level of a particular stock index such as the S&P 500 or the Dow Jones Industrial Average or NIFTY or BSE sensx. The agreement calls for the contract to be bought or sold at a designated time in the future. Just as hedgers and speculators buy and sell futures contracts based on future prices of individual stocks they may—for mostly the same reasons—buy and sell such contracts based on the level of a number of stock indexes.

Stock index futures may be used to either speculate on the equity market's general performance or to hedge a stock portfolio against a decline in value. Unlike commodity futures or individual stocks, stock index futures are not based on tangible goods, thus all settlements are in cash. Because settlements are in cash, investors usually have to meet liquidity or income requirements to show that they have money to cover their potential losses.

Stock index futures are traded in terms of number of contracts. Each contract is to buy or sell a fixed value of the index. The value of the index is defined as the value of the index multiplied by the specified monetary amount. In Nifty 50 futures contract traded at the National Stock Exchange, the contract specification states:

1 Contract = 50 units of Nifty 50 * Value of Nifty 50

If we assume that Nifty 50 is quoting at 8000 , the value of one contract will be equal to ₹ 4,00,000 (50*8000). The contract size of 50 units of Nifty 50 in this case is fixed by National Stock Exchange where the contract is traded.

Example

Consider the following:

Current value of index	-	1400
Dividend yield	-	6%
CCRR	-	10%

To find the value of a 3 month forward contract.

$$\begin{aligned} A &= P e^{n(r-y)} \\ &= 1400 \times e^{(3/12)(0.10 - .06)} = ₹ 1,414 \end{aligned}$$

10.4.3 Trading Mechanism in Stock Futures: While trading in futures contracts (both stock as well as futures) both buyers and sellers of the contract have to deposit an initial margin with their brokers based on the value of contract entered. The rules for calculation of margins to be deposited with the brokers are framed by the stock exchanges.

Another major feature regarding the margin requirements for stock as well index futures is that the margin requirement is continuous. Every business day, the broker will calculate the margin requirement for each position. The investor will be required to post additional margin funds if the account does not meet the minimum margin requirement.

The investor can square off his position in the futures contract before expiry or wait till expiry date when the contracts will automatically stand as squared off at the closing price on the expiry date. In Indian stock market the expiry date is the last Thursday of the relevant month to which the future contract belongs.

Example – Margin Requirements

In a stock future contract on ITC stock at ₹ 120, both the buyer and seller have a margin requirement of 20% or ₹ 2400. If ITC stock goes up to ₹ 122, the account of the long contract is credited with ₹ 200 ($₹ 122 - ₹ 120 = ₹ 2 \times 100 = ₹ 200$) and the account of the seller (seller) is debited by the same ₹ 200. This indicates that investors in futures must be very vigilant - they must keep close track of market movements.

10.4.4 Purpose of Trading in Futures: Trading in futures is for two purposes namely:

- (a) Speculation and
- (b) Hedging

(a) Speculation – For simplicity we will assume that one contract= 100 units and the margin requirement is 20% of the value of contract entered. Brokerage and transaction costs are not taken into account.

Example- Going Long on a Single Stock Futures Contract

Suppose an investor is bullish on McDonald's (MCD) and goes long on one September stock future contract on MCD at ₹ 80. At some point in the near future, MCD is trading at ₹ 96. At that point, the investor sells the contract at ₹ 96 to offset the open long position and makes a ₹ 1600 gross profit on the position.

This example seems simple, but let's examine the trades closely. The investor's initial margin requirement was only ₹ 1600 ($₹ 80 \times 100 = ₹ 8,000 \times 20\% = ₹ 1600$). This investor had a 100% return on the margin deposit. This dramatically illustrates the leverage power of trading futures. Of course, had the market moved in the opposite direction, the investor easily could have experienced losses in excess of the margin deposit.

The pay off table for the above transaction can be depicted as follows:-

Particulars	Details	Inflow/(outflow){In ₹}
Initial Payoff - Margin (Refundable at maturity)	$₹ 8000 \times 20\% = ₹ 1600$	(₹ 1600)
Pay off upon squaring off the contract	Profit $(₹ 96 - ₹ 80) \times 100 = ₹ 1600$ Initial Margin= ₹ 1600	₹ 3200
Net Payoff		₹ 1600

Example- Going Short on a Single Stock Futures Contract

An investor is bearish in Kochi Refinery (KR) stock for the near future and goes short an August stock future contract on KR at ₹ 160. KR stock performs as the investor had guessed

5.32 Strategic Financial Management

and drops to ₹ 140 in July. The investor offsets the short position by buying an August stock future at ₹ 140. This represents a gross profit of ₹ 20 per share, or a total of ₹ 2,000.

Again, let's examine the return the investor had on the initial deposit. The initial margin requirement was ₹ 3,200 ($₹ 160 \times 100 = ₹ 16,000 \times 20\% = ₹ 3,200$) and the gross profit was ₹ 2,000. The return on the investor's deposit was more than 60% - a terrific return on a short-term investment.

Particulars	Details	Inflow/(outflow){In ₹}
Initial Payoff - Margin (Refundable at maturity)	$₹ 160 \times 100 \times 20\% = ₹ 3200$	(₹ 3200)
Pay off upon squaring off the contract	Profit $(₹ 160 - ₹ 140) \times 100 = ₹ 2000$ Initial Margin = ₹ 3200	₹ 5200
Net Payoff		₹ 2000

Example- Going Long on an Index Futures Contract

Suppose an investor has a bullish outlook for Indian market for the month of October 2014. He will go for a long position on October 2014 Nifty Index Future Contract. Assuming that he enters into long positions when Nifty is trading at 8000 and one month later he squares off his position when the value of Nifty rises to 8500 his payoff will be as under. (Assuming that one contract = 50 units of Nifty and margin requirement is 20% of the value of the contract)

Particulars	Details	Inflow/(outflow){In ₹}
Initial Payoff - Margin (Refundable at maturity)	$(8000 \times 50 \times 20\%) = ₹ 80,000$	(₹ 80,000)
Pay off upon squaring off the contract	Profit $(8500 - 8000) \times 50 = ₹ 25,000$ Initial Margin = ₹ 80,000	₹ 1,05,000
Net Payoff		₹ 25,000

Example- Going Short on an Index Futures Contract

Suppose an investor has a bearish outlook for Indian banking sector for the month of October 2014. He will go for a short position for one October 2014 Bank Nifty Future Contract. Assuming that he enters into short positions when Bank Nifty is trading at 25000 and one month later he squares off his position when the value of Bank Nifty declines to 24000 his payoff will be as under. (Assuming that one contract = 10 units of Bank Nifty and margin requirement is 20% of the value of the contract)

Particulars	Details	Inflow/(outflow){In ₹}
Initial Payoff - Margin (Refundable at maturity)	$(25000 \times 10 \times 20\%) = ₹ 50,000$	(₹ 50,000)
Pay off upon squaring	Profit $(25000 - 24000) \times 10 = ₹ 10,000$	₹ 60,000

off the contract	Initial Margin= ₹ 50,000	
Net Payoff		₹ 10,000

(b) Hedging – Hedging is the practice of taking a position in one market to offset and balance against the risk adopted by assuming a position in a contrary or opposing market or investment. In simple language, hedging is used to reduce any substantial losses/gains suffered by an individual or an organization.

To hedge, the investor takes a stock future position exactly opposite to the stock position. That way, any losses on the stock position will be offset by gains on the future position.

Example- Using single stock future as a Hedge

Consider an investor who has bought 100 shares of Tata Steel (TS) at ₹ 300. In July, the stock is trading at ₹ 350. The investor is happy with the unrealized gain of ₹ 50 per share but is concerned that in a stock as volatile as TS, the gain could be wiped out in one bad day. The investor wishes to keep the stock at least until September, however, because of an upcoming dividend payment.

To hedge, the investor sells a ₹ 350 September stock future contract - whether the stock rises or declines, the investor has locked in the ₹ 50-per-share gain. In September on maturity date of the futures contract (last Thursday of September), the investor sells the stock at the market price and buys back the future contract.

The pay-off at various price levels of Tata Steel is as under:-

Particulars	September Closing price of Tata Steel= ₹ 300	September Closing price of Tata Steel= ₹ 350	September Closing price of Tata Steel= ₹ 400
Initial Payoff	₹ 300x100 = ₹ 30000	₹ 300x100 = ₹ 30000	₹ 300x100 = ₹ 30000
Cost of scrip in cash market	₹ 350X100X20% = ₹7000	₹ 350X100X20% = ₹7000	₹ 350X100X20% = ₹7000
Margin Payment on futures contract	₹ 37000	₹ 37000	₹ 37000
Total Initial Payoff (outflow)			
Pay-off at maturity (September end)	Sale proceeds of TS in cash market= ₹300x 100 = ₹ 30000	Sale proceeds of TS in cash market= ₹350x 100 = ₹ 35000	Sale proceeds of TS in cash market= ₹400x 100 = ₹ 40000

5.34 Strategic Financial Management

Total Pay-off at maturity (Inflow)	Margin refund on futures contract = ₹ 7000	Margin refund on futures contract = ₹ 7000	Margin refund on futures contract = ₹ 7000
	Gain on futures contract(inflow) = $(₹ 350 - ₹ 300) \times 100 = ₹ 5000$	No profit /loss on futures contract = $(₹ 350 - ₹ 350) \times 100 = ₹ 0$	Loss on futures contract(outflow) = $(₹ 350 - ₹ 400) \times 100 = -₹ 5000$
	₹ 42000	₹ 42000	₹ 42000
Net Payoff	₹ 5000	₹ 5000	₹ 5000

Hence it can be observed in the above table that in any case the investor has locked in a profit of ₹ 5000 via hedging.

In a similar manner as illustrated above index futures can also be used as a hedge. The difference would be that instead of single stock futures the investor would enter into a position into a Index Futures Contract according to the risk potential of the investor.

10.4.5 Marking to Market: It implies the process of recording the investments in traded securities (shares, debt-instruments, etc.) at a value, which reflects the market value of securities on the reporting date. In the context of derivatives trading, the futures contracts are marked to market on periodic (or daily) basis. Marking to market essentially means that at the end of a trading session, all outstanding contracts are repriced at the settlement price of that session. Unlike the forward contracts, the future contracts are repriced every day. Any loss or profit resulting from repricing would be debited or credited to the margin account of the broker. It, therefore, provides an opportunity to calculate the extent of liability on the basis of repricing. Thus, the futures contracts provide better risk management measure as compared to forward contracts.

Suppose on 1st day we take a long position, say at a price of ₹ 100 to be matured on 7th day. Now on 2nd day if the price goes up to ₹ 105, the contract will be repriced at ₹ 105 at the end of the trading session and profit of ₹ 5 will be credited to the account of the buyer. This profit of ₹ 5 may be drawn and thus cash flow also increases. This marking to market will result in three things – one, you will get a cash profit of ₹ 5; second, the existing contract at a price of ₹ 100 would stand cancelled; and third you will receive a new futures contract at ₹ 105. In essence, the marking to market feature implies that the value of the futures contract is set to zero at the end of each trading day.

10.4.6 Advantages of Stock Index Futures Trading over Stock Futures Trading: Stock index futures are most popular financial derivatives over stock futures due to following reasons:

1. It adds flexibility to one's investment portfolio. Institutional investors and other large equity holders prefer this instrument in terms of portfolio hedging purpose. The stock systems do not provide this flexibility and hedging.

2. It creates the possibility of speculative gains using leverage. Because a relatively small amount of margin money controls a large amount of capital represented in a stock index contract, a small change in the index level might produce a profitable return on one's investment if one is right about the direction of the market. Speculative gains in stock futures are limited but liabilities are greater.
3. Stock index futures are the most cost efficient hedging device whereas hedging through individual stock futures is costlier.
4. Stock index futures cannot be easily manipulated whereas individual stock price can be exploited more easily.
5. Since, stock index futures consists of many securities, so being an average stock, is much less volatile than individual stock price. Further, it implies much lower capital adequacy and margin requirements in comparison of individual stock futures. Risk diversification is possible under stock index future than in stock futures.
6. One can sell contracts as readily as one buys them and the amount of margin required is the same.
7. In case of individual stocks the outstanding positions are settled normally against physical delivery of shares. In case of stock index futures they are settled in cash all over the world on the premise that index value is safely accepted as the settlement price.
8. It is also seen that regulatory complexity is much less in the case of stock index futures in comparison to stock futures.
9. It provides hedging or insurance protection for a stock portfolio in a falling market.

Futures also have **disadvantages**. These include:

- *Risk*: An investor who is long in a stock can only lose what he or she has invested. In a stock future contract, there is the risk of losing significantly more than the initial investment (margin deposit).
- *No Stock-holder Privileges*: The future owner has no voting rights and no rights to dividends.
- *Requires Continued Vigilance on part of the investor*: Stock Futures are investments that require investors to monitor their positions more closely than many would like to do. Because future accounts are marked to the market every business day, there is the possibility that the brokerage firm might issue a margin call, requiring the investor to decide whether to quickly deposit additional funds or liquidate the position.

10.4.7 Uses/Advantages of Stock Index Futures: Investors can use stock index futures to perform myriad tasks. Some common uses are:

- (1) Investors commonly use stock index futures to change the weightings or risk exposures of their investment portfolios. A good example of this is investors who hold equities from two or more countries. Suppose these investors have portfolios invested in 60 percent U.S. equities and 40 percent Japanese equities and want to increase their systematic risk

5.36 Strategic Financial Management

in the U.S. market and reduce these risks to the Japanese market. They can do this by buying U.S. stock index futures contracts in the indexes underlying their holdings and selling Japanese contracts (in the Nikkei Index).

- (2) Stock index futures also allow investors to separate market timing from market selection decisions. For instance, investors may want to take advantage of perceived immediate increases in an equity market but are not certain which securities to buy; they can do this by purchasing stock index futures. If the futures contracts are bought and the present value of the money used to buy them is invested in risk-free securities, investors will have a risk exposure equal to that of the market. Similarly, investors can adjust their portfolio holdings at a more leisurely pace. For example, assume the investors see that they have several undesirable stocks but do not know what holdings to buy to replace them. They can sell the unwanted stocks and, at the same time, buy stock index futures to keep their exposure to the market. They can later sell the futures contracts when they have decided which specific stocks they want to purchase.
- (3) Investors can also make money from stock index futures through index arbitrage, also referred to as program trading. Basically, arbitrage is the purchase of a security or commodity in one market and the simultaneous sale of an equal product in another market to profit from pricing differences. Investors taking part in stock index arbitrage seek to gain profits whenever a futures contract is trading out of line with the fair price of the securities underlying it. Thus, if a stock index futures contract is trading above its fair value, investors could buy a basket of about 100 stocks composing the index in the correct proportion—such as a mutual fund comprised of stocks represented in the index—and then sell the expensively priced futures contract. Once the contract expires, the equities could then be sold and a net profit would result. While the investors can keep their arbitrage position until the futures contract expires, they are not required to. If the futures contract seems to be returning to fair market value before the expiration date, it may be prudent for the investors to sell early.
- (4) Investors often use stock index futures to hedge the value of their portfolios. Provide hedging or insurance protection for a stock portfolio in a falling market. To implement a hedge, the instruments in the cash and futures markets should have similar price movements. Also, the amount of money invested in the cash and futures markets should be the same. To illustrate, while investors owning well-diversified investment portfolios are generally shielded from unsystematic risk (risk specific to particular firms), they are fully exposed to systematic risk (risk relating to overall market fluctuations). A cost-effective way for investors to reduce the exposure to systematic risk is to hedge with stock index futures, similar to the way that people hedge commodity holdings using commodity futures. Investors often use short hedges when they are in a long position in a stock portfolio and believe that there will be a temporary downturn in the overall stock market. Hedging transfers the price risk of owning the stock from a person unwilling to

accept systematic risks to someone willing to take the risk.

To carry out a short hedge, the hedger sells a futures contract; thus, the short hedge is also called a "sell-hedge."

Example

Consider investors who own portfolios of securities valued at \$.1.2 million with a dividend of 1 percent. The investors have been very successful with their stock picks. Therefore, while their portfolios' returns move up and down with the market, they consistently outperform the market by 6 percent. Thus, the portfolio would have a beta of 1.00 and an alpha of 6 percent. Say that the investors believe that the market is going to have a 15 percent decline, which would be offset by the 1 percent received from dividends. The net broad market return would be -14 percent but, since they consistently outperform the market by 6 percent, their estimated return would be -8 percent. In this instance, the investors would like to cut their beta in half without necessarily cutting their alpha in half. They can achieve this by selling stock index futures. In this scenario, the S&P 500 index is at 240. The contract multiplier is \$500, and therefore each contract represents a value of \$120,000. Since the investors want to simulate the sale of half of their \$1.2 million portfolios, they must sell five contracts ($5 \times \$120,000 = \$600,000$). Thus, their portfolios would be affected by only half of the market fluctuation. While the investors could protect their portfolios equally well by selling half of their shares of stock and buying them again at short time later, using a short hedge on stock index futures is much cheaper than paying the capital gains tax plus the broker commissions associated with buying and selling huge blocks of stock.

At the extreme, stock index futures can theoretically eliminate the effects of the broad market on a portfolio. Perfect hedges are very unusual because of the existence of basis risk. The basis is the difference between the existing price in the futures market and the cash price of the underlying securities. Basis risk occurs when changes in the economy and the financial situation have different impacts on the cash and futures markets.

- (5) Stock index futures add flexibility to his or her portfolio as a hedging and trading instrument.
- (6) Create the possibility of speculative gains using leverage. Because a relatively small amount of margin money controls a large amount of capital represented in a stock index contract, a small change in the index level might produce a profitable return on one's investment if he or she is right about the market's direction.
- (7) Maintain one's stock portfolio during stock market corrections. One may not need "insurance" for all the time, but there are certain times when one would like less exposure to stocks. Yet, one doesn't want to sell off part of a stock portfolio that has taken him or her a long time to put together and looks like a sound, long-term investment program.

5.38 Strategic Financial Management

- (8) One of the major advantages of futures markets, in general, is that one can sell contracts as readily as he or she can buy them and the amount of margin required is the same. Mutual funds do not specialize in bear market approaches by short selling stocks but, and also it is not possible for individuals to short sell stocks in a falling market to make money.
- (9) Transfer risk quickly and efficiently. Whether one is speculating, looking for insurance protection (hedging), or temporarily substituting futures for a later cash transaction, most stock index futures trades can be accomplished quickly and efficiently. Many mutual funds require investors to wait until the end of the day to see at what price they were able to purchase or sell shares. With today's volatility, once-a-day pricing may not give one the maneuverability to take positions at exactly the time he or she wants. Stock index futures give individual the opportunity to get into or out of a position whenever he or she wants.

10.4.8 The Indian Scenario: In India, trading of NSE Nifty 50, CNX Stock Index and S&P CNX Nifty Index have become really popular.

(a) S&P CNX Nifty Index Futures: The NSE Nifty futures contract is a forward contract, which was traded on the National Stock Exchange (NSE) on June 12, 2000. The index futures contracts are based on the popular market benchmark S&P CNX Nifty index.

(i) Trading cycle: S&P CNX Nifty futures contracts have a maximum of 3-month trading cycle - the near month (one), the next month (two) and the far month (three). A new contract is introduced on the trading day following the expiry of the near month contract. The new contract will be introduced for a three month duration. This way, at any point in time, there will be 3 contracts available for trading in the market i.e., one near month, one mid month and one far month duration respectively.

(ii) Expiry day: S&P CNX Nifty futures contracts expire on the last Thursday of the expiry month. If the last Thursday is a trading holiday, the contracts expire on the previous trading day.

(iii) Trading Parameters/ Contract size: The value of the future contract may not be less than 2 lakhs at the time of introduction. The permitted lot size for future and option contract is the same for given underlying or such lot size as may be stipulated by Exchange from time to time.

Price steps: The price step in respect of S&P CNX Nifty futures contracts is Re.0.05.

Base Prices: Base price of S&P CNX Nifty futures contracts on the first day of trading would be theoretical futures price. The base price of the contracts on subsequent trading days would be the daily settlement price of the futures contracts.

Price bands: There are no day minimum/maximum price ranges applicable for S&P CNX Nifty futures contracts. However, in order to prevent erroneous order entry by trading members, operating ranges are kept at +/- 10 %.

Quantity freeze: Quantity Freeze for S&P CNX Nifty futures contracts would be 15,000 units or greater.

Order type/Order book/Order attribute: The different order types may be Regular lot order, Stop loss order, Immediate or cancel and Spread order.

(b) S&P CNX NSE Nifty 50 Index: It is a well diversified 50 stock index accounting for 24 sectors of the economy. The total traded value of all Nifty stocks is about 50% of the traded value of all stocks on the NSE. Nifty stocks represent about 60% of the total market capitalisation.

You can trade the 'entire stock market' instead of individual securities.

Index Futures are:

- Highly liquid
- Large intra-day price swings
- High leverage
- Low initial capital requirement
- Lower risk than buying and holding stocks
- Just as easy to trade the short side as the long side
- Only have to study one index instead of 100's of stocks

Index futures are settled in cash and therefore all problems related to bad delivery, forged, fake certificates, etc can be avoided. Since the index consists of many securities (50 securities) it is very difficult to manipulate the index.

You are required to pay a small fraction of the value of the total contract as margins. This means that trading in Stock Index Futures is a leveraged activity since the investor is able to control the total value of the contract with a relatively small amount of margin.

[Source: NSE Website]

11. Options

An Option may be understood as a privilege, sold by one party to another, that gives the buyer the right, but not the obligation, to buy (call) or sell (put) any underlying say stock, foreign exchange, commodity, index, interest rate etc. at an agreed-upon price within a certain period or on a specific date regardless of changes in underlying's market price during that period.

The various kinds of stock options include put and call options, which may be purchased in anticipation of changes in stock prices, as a means of speculation or hedging. A put gives its holder an option to sell, or put, shares to another party at a fixed price even if the market price declines. A call gives the holder an option to buy, or call for, shares at a fixed price even if the market price rises.

11.1 Stock Options: Stock options involve no commitments on the part of the buyers of the option contracts individual to purchase or sell the stock and the option is usually exercised only if the price of the stock has risen (in case of call option) or fallen (in case of put option)

5.40 Strategic Financial Management

above the price specified at the time the option was given. One important difference between stocks and options is that stocks give you a small piece of ownership in the company, while options are just contracts that give you the right to buy or sell the stock at a specific price by a specific date. Investing in options provide limited risk, high potential reward and smaller amount of capital required to control the same number of shares which can be done via investing through cash market.

11.2 Stock Index Option: It is a call or put option on a financial index. Investors trading index options are essentially betting on the overall movement of the stock market as represented by a basket of stocks.

Index options can be used by the portfolio managers to limit their downside risk. Suppose the value of the index is S . Consider a manager in charge of a well-diversified portfolio which has a β of 1.0 so that its value mirrors the value of the index. If for each 100 S rupees in the portfolio, the manager buys one put option contract with exercise price X , the value of the portfolio is protected against the possibility of the index falling below X . For instance, suppose that the manager's portfolio is worth ₹ 10,00,000 and the value of the index is 10000. The portfolio is worth 100 times the index. The manager can obtain insurance against the value of the portfolio dropping below ₹ 900,000 in the next two months by buying 1 put option contracts with a strike price of ₹ 9000. To illustrate how this would work, consider the situation where the index drops to 8500. The portfolio will be worth ₹ 850000 (100 x 8500). However, the payoff from the options will be $1 \times (\text{₹ } 9000 - \text{₹ } 8500) \times 100 = \text{₹ } 50000$, bringing the total value of the portfolio up to the insured value of ₹ 9,00,000.

11.3 Parties to the Options: There are always two types of entities for an option transaction buyer and a seller (also known as writer of the option). So, for every call or put option purchased, there is always someone else selling/buying it. When individuals sell options, they effectively create a security that didn't exist before. This is known as writing an option and explains one of the main sources of options, since neither the associated company nor the options exchange issues options. When you write a call, you may be obligated to sell shares at the strike price any time before the expiration date. When you write a put, you may be obligated to buy shares at the strike price any time before expiration. The price of an option is called its premium. The buyer of an option cannot lose more than the initial premium paid for the contract, no matter what happens to the underlying security. So, the risk to the buyer is never more than the amount paid for the option. The profit potential, on the other hand, is theoretically unlimited.

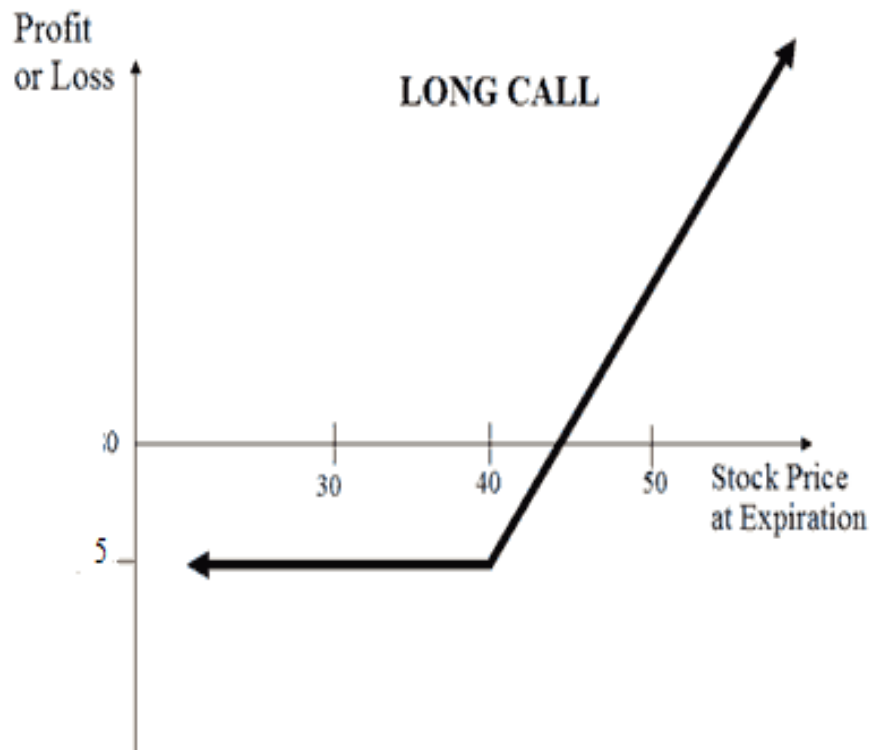
11.4 Premium for Options: In return for the premium received from the buyer, the seller of an option assumes the risk of having to deliver (if a call option) or taking delivery (if a put option) of the shares of the stock. Unless that option is covered by another option or a position in the underlying stock (opposite to the position taken via selling the option contracts), the

seller's loss can be unlimited, meaning the seller can lose much more than the original premium received.

11.5 Types of Options: You should be aware that there are two basic styles of options: American and European. An American, or American-style, option can be exercised at any time between the date of purchase and the expiration date. Most exchange-traded options are American style and all stock options are American style. A European, or European-style, option can only be exercised on the expiration date. In Indian Market options are European style options.

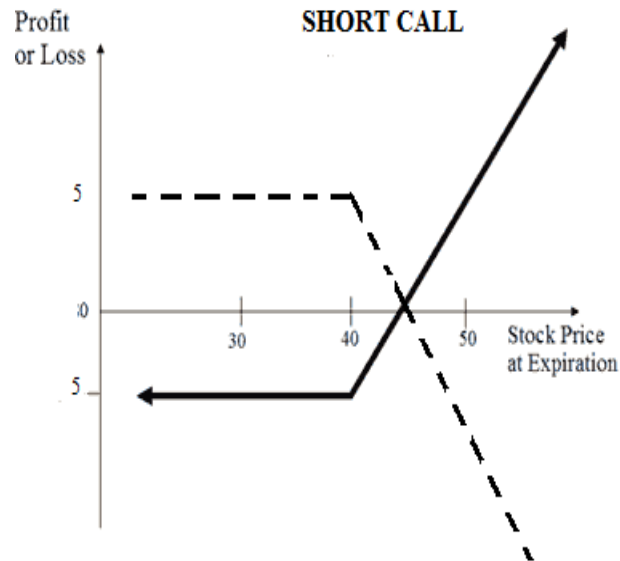
11.6 Pay-off scenarios: The possible pay-off under various scenarios is as follows:

(i) **Pay-off for a Call Buyer:** Also, called Long Call. For example, Mr. X buys a call option at strike price of ₹ 40 in exchange of a premium of ₹ 5. In case if actual price of the stock at the time of exercise is less than ₹ 40, Mr. X would not exercise his option his loss would be ₹ 5. Mr. X would exercise his option at any price above ₹ 40. In such situation his loss would start reducing and at the price of ₹ 45 there will be Break Even at the price of ₹ 45.

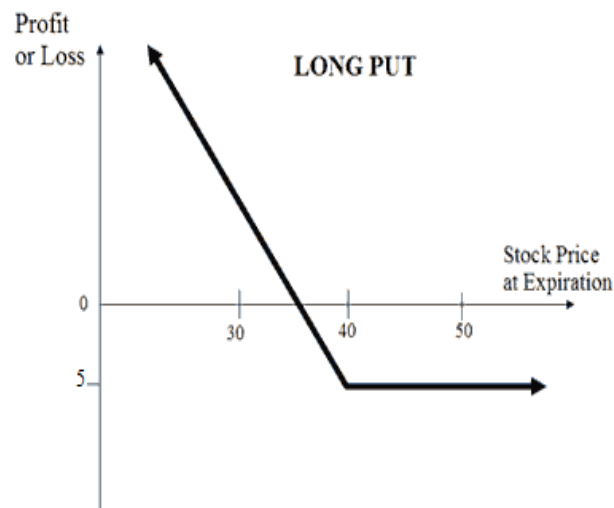


(ii) **Pay-off for a Call Seller:** Also, called Short Call. The pay-off profile of Call Seller shall be the mirror image of the Long Call as shown below in dotted line.

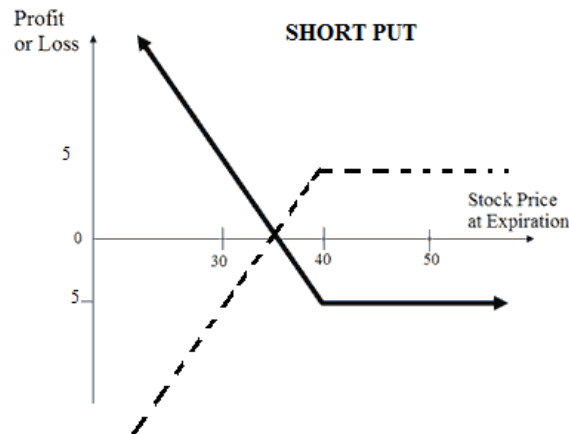
5.42 Strategic Financial Management



(iii) **Pay-off for a Put Buyer:** Also, called Long Put. For example, Mr. X buys a put option at strike price of ₹ 40 in exchange of a premium of ₹ 5. In case if actual price of the stock at the time of exercise is less than ₹ 40, Mr. X would exercise his option his gain would be (Spot Price – Exercise Price – Premium). Mr. X would exercise his option at any price below ₹ 40. The break- even Break Even price will be ₹ 35 and Mr. X would not exercise his option for any price above ₹ 40.



(iv) **Pay-off for a Put Seller:** Also, called Short Put. The pay-off profile of Put Seller shall be the mirror image of the Long Put as shown below in dotted line.



11.7 Comparison with Single Stock Futures: Investing in stock futures differs from investing in equity options contracts in several ways:

- *Nature:* In options, the buyer of the options has the right but not the obligation to purchase or sell the stock. However while going in for a long futures position, the investor is obligated to square off his position at or before the expiry date of the futures contract.
- *Movement of the Market:* Options traders use a mathematical factor, the delta that measures the relationship between the options premium and the price of the underlying stock. At times, an options contract's value may fluctuate independently of the stock price. By contrast, the future contract will much more closely follow the movement of the underlying stock.
- *The Price of Investing:* When an options investor takes a long position, he or she pays a premium for the contract. The premium is often called a sunk cost. At expiration, unless the options contract is in the money, the contract is worthless and the investor has lost the entire premium. Stock future contracts require an initial margin deposit and a specific maintenance level of cash for mark to market margin

11.8 Option Valuation Techniques: We have already been introduced to characteristics of both European and American Options. Assuming a European Call Option on a non-dividend paying stock it is easy to see that its value at expiration date shall either be zero or the difference between the market price and the exercise price, whichever is higher. It may be noted that the value of an Option cannot be negative. An investor is required to pay a premium for acquiring such an Option. In case this premium is less than the value of the Option, the investor shall make profits; however, in case the premium paid is more than the value, the investor shall end up losing money. Note that, while measuring these gains or losses, Time Value of Money and Transaction Costs have been ignored. The opposite picture emerges for the Writer.

The Value of an Option with one period to expire: Simply speaking, the theoretical value of an Option should be the difference between the current stock price and the exercise price. In case the stock price is less than the exercise price the theoretical value shall be zero.

5.44 Strategic Financial Management

However, as long as there is time to expiration it is possible for a zero theoretical value Option to have some actual positive Market value. This is because there may be a possibility of the stock price rising at which point of time the Option may be exercised advantageously.

11.8.1 Binomial Model: The binomial model breaks down the time to expiration into potentially a very large number of time intervals, or steps. This requires the use of probability and future discrete projections through which a tree of stock prices is initially produced working forward from the present to expiration.

To facilitate understanding we shall restrict ourselves to a European Option having a one year time branching process where at the end of the year there are only two possible values for the common stock. One is higher and the other lower than the current value. Assume that the probability of the two values to materialize is known. In such a situation, a hedged position can be established by buying the stock and by writing Options. This shall help offset price movements. At each step, it is assumed that the stock price will either move up or down. The pricing of the Options should be such that the return equals the risk-free rate.

The above mentioned is an example of Binomial Distribution. When the number of high and low value projections for the concerned stock are numerous, the tree shall represent all possible paths that the stock price could take during the life of the option.

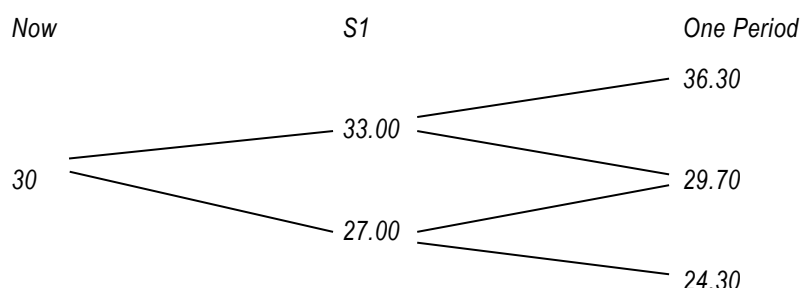
At the end of the tree - i.e. at expiration of the option - all the terminal option prices for each of the final possible stock prices are known as they simply equal their intrinsic values.

The big advantage the binomial model has over the Black-Scholes model is that it can be used to accurately price American options. This is because with the binomial model it's possible to check at every point in an option's life (i.e. at every step of the binomial tree) for the possibility of early exercise (e.g. where, due to e.g. a dividend, or a put being deeply in the money the option price at that point is less than its intrinsic value).

Where an early exercise point is found it is assumed that the option holder would elect to exercise, and the option price can be adjusted to equal the intrinsic value at that point. This then flows into the calculations higher up the tree and so on.

Illustration 1

Following is a two-period tree for a share of stock in CAB Ltd.:



Using the binomial model, calculate the current fair value of a regular call option on CAB Stock with the following characteristics: $X = ₹ 28$, Risk Free Rate = 5 percent. You should also indicate the composition of the implied riskless hedge portfolio at the valuation date.

Solution

$$u = 33.00/30.00 = 36.30/33.00 = 1.10 \quad d = 27.00/30.00 = 24.30/27.00 = 0.90$$

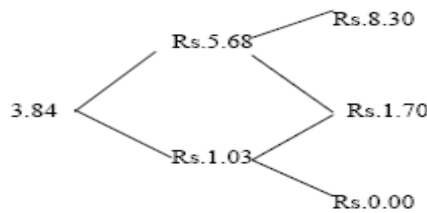
$$r = (1 + .05)^{1/2} = 1.0247$$

$$p = \frac{r - d}{u - d} = \frac{1.0247 - 0.90}{1.10 - 0.90} = 0.1247/0.20 = 0.6235$$

$$C_{uu} = \text{Max} [0, 36.30 - 28] = 8.30$$

$$C_{ud} = \text{Max} [0, 29.70 - 28] = 1.70$$

$$C_{dd} = \text{Max} [0, 24.30 - 28] = 0$$



$$C_u = \frac{(0.6235)(8.30) + (0.3765)(1.70)}{1.025} = \frac{5.175 + .64}{1.025} = 5.815/1.025 = ₹ 5.675$$

$$C_d = \frac{(0.6235)(1.70) + (0.3765)(0.00)}{1.025} = \frac{1.05995}{1.025} = ₹ 1.0340$$

$$C_o = \frac{(0.6235)(5.675) + (0.3765)(1.0340)}{1.025} = \frac{3.538 + 3895}{1.025} = ₹ 3.83$$

$$h = (33.00 - 27.00)/(1.03 - 5.68) = 6.00/4.65 = 1.29$$

11.8.2 Risk Neutral Method: The “risk-neutral” technique can also be used to value derivative securities. It was developed by John Cox and Stephen Ross in 1976. The basic argument in the risk neutral approach is that since the valuation of options is based on arbitrage and is therefore independent of risk preferences; one should be able to value options assuming any set of risk preferences and get the same answer as by using Binomial Model. This is a simple model.

Example

Suppose the price of the share of Company X is ₹ 50. In one year it is expected either to go up to ₹ 60 or go down to ₹ 40. The risk free rate of interest is 5%.

Let p be the probability that the price will increase then (1-p) will be probability of price decrease. The value of the stock today must be equal to the present value of the expected price after one year discounted at risk-free rate as follows:

5.46 Strategic Financial Management

$$50 = \frac{60p + 40(1-p)}{1.05}$$

On solving we shall get the value of $p = 0.65$. With this value we can find out the present value of the expected payout as follows:

$$\frac{10(0.65) + 0(1-0.65)}{1.05} = 6.19$$

It may however be noted that the discounting can also be made on daily basis as shown in following illustration.

Illustration 2

The current market price of an equity share of Penchant Ltd is ₹ 420. Within a period of 3 months, the maximum and minimum price of it is expected to be ₹ 500 and ₹ 400 respectively. If the risk free rate of interest be 8% p.a., what should be the value of a 3 months Call option under the "Risk Neutral" method at the strike rate of ₹ 450 ? Given $e^{0.02} = 1.0202$

Solution

Let the probability of attaining the maximum price be p

$$(500 - 420) \times p + (400 - 420) \times (1-p) = 420 \times (e^{0.02} - 1)$$

$$\text{or, } 80p - 20(1 - p) = 420 \times 0.0202$$

$$\text{or, } 80p - 20 + 20p = 8.48$$

$$\text{or, } 100p = 28.48$$

$$p = 0.2848$$

$$\text{The value of Call Option in ₹} = \frac{0.2848 \times (500 - 450)}{1.0202} = \frac{0.2848 \times 50}{1.0202} = 13.96$$

11.8.3 Black-Scholes Model: The Black-Scholes model is used to calculate a theoretical price of an Option. The Black-Scholes price is nothing more than the amount an option writer would require as compensation for writing a call and completely hedging the risk of buying stock. The important point is that the hedger's view about future stock prices is irrelevant. Thus, while any two investors may strongly disagree on the rate of return they expect on a stock they will, given agreement to the assumptions of volatility and the risk-free rate, always agree on the fair value of the option on that underlying asset. This key concept underlying the valuation of all derivatives -- that fact that the price of an option is independent of the risk preferences of investors -- is called risk-neutral valuation. It means that all derivatives can be valued by assuming that the return from their underlying assets is the risk-free rate.

The model is based on a normal distribution of underlying asset returns.

The following assumptions accompany the model:

1. European Options are considered,

2. No transaction costs,
3. Short term interest rates are known and are constant,
4. Stocks do not pay dividend,
5. Stock price movement is similar to a random walk,
6. Stock returns are normally distributed over a period of time, and
7. The variance of the return is constant over the life of an Option.

The original formula for calculating the theoretical option price (OP) is as follows:

$$OP = SN(d_1) - Xe^{-rt}N(d_2)$$

Where:

$$d_1 = \frac{\ln\left(\frac{S}{X}\right) + \left(r + \frac{v^2}{2}\right)t}{v\sqrt{t}}$$

$$d_2 = d_1 - v\sqrt{t}$$

The variables are:

S = current stock price

X = strike price of the option

t = time remaining until expiration, expressed as a percent of a year

r = current continuously compounded risk-free interest rate

v = annual volatility of stock price (the standard deviation of the short-term returns over one year).

\ln = natural logarithm

$N(x)$ = standard normal cumulative distribution function

e = the exponential function

Understanding the formula

$N(d_1)$ represents the hedge ratio of shares of stock to Options necessary to maintain a fully hedged position.

Consider the Option holder as an investor who has borrowed an equivalent amount of the exercise price at interest rate r . $Xe^{-rt}N(d_2)$ represents this borrowing which is equivalent to the present value of the exercise price times an adjustment factor of $N(d_2)$

The main advantage of the Black-Scholes model is speed -- it lets you calculate a very large number of option prices in a very short time.

5.48 Strategic Financial Management

The Black-Scholes model has one major limitation that it cannot be used to accurately price options with an American-style exercise as it only calculates the option price at one point of time -- at expiration. It does not consider the steps along the way where there could be the possibility of early exercise of an American option.

Illustration 3

- (i) The shares of TIC Ltd. are currently priced at ₹ 415 and call option exercisable in three months' time has an exercise rate of ₹ 400. Risk free interest rate is 5% p.a. and standard deviation (volatility) of share price is 22%. Based on the assumption that TIC Ltd. is not going to declare any dividend over the next three months, is the option worth buying for ₹ 25?
- (ii) Calculate value of aforesaid call option based on Black Scholes valuation model if the current price is considered as ₹ 380.
- (iii) What would be the worth of put option if current price is considered ₹ 380.
- (iv) If TIC Ltd. share price at present is taken as ₹ 408 and a dividend of ₹ 10 is expected to be paid in the two months time, then, calculate value of the call option.

Solution

- (i) Given: TIC Ltd. Current Price = ₹ 415

Exercise rate = 400

Risk free interest rate is = 5% p.a.

SD (Volatility) = 22%

Based on the above bit is calculated value of an option based on Black Scholes Model:

$$d_1 = \frac{\ln\left(\frac{415}{400}\right) + \left[.05 + \frac{1}{2} (.22)^2\right] .25}{.22 \sqrt{.25}} = \frac{.03681 + .01855}{.11} = .5032727$$

$$d_2 = \frac{\ln\left(\frac{415}{400}\right) + \left[.05 - \frac{1}{2} (.22)^2\right] .25}{.22 \sqrt{.25}} = \frac{.03681 + .00645}{.11} = .3932727$$

$$N(d_1) = N(.50327) = 1 - .3072 = .6928$$

$$N(d_2) = N(.39327) = 1 - .3471 = .6529$$

$$\begin{aligned} \text{Value of Option} &= 415 (.6928) - \frac{400}{e^{(.05)(.25)}} (.6529) \\ &= 287.512 - \frac{400}{1.012578} (.6529) = 287.512 - 257.916 = ₹ 29.60 \end{aligned}$$

NB : N(0.39327) can also be find as under :

- Step 1 :** From table of area under normal curve find the area of variable 0.39 i.e. 0.6517.
- Step 2 :** From table of area under normal curve find the area of variable 0.40.
- Step 3 :** Find out the difference between above two variables and areas under normal curve.
- Step 4 :** Using interpolation method find out the value of 0.00327. Which is as follows:

$$\frac{0.0037}{0.01} \times 0.00327 = 0.0012$$

- Step 5 :** Add this value, computed above to the N(0.39). Thus N (0.39327) = 0.6517 + 0.0012 = 0.6529

Since market price of ₹ 25 is less than ₹ 27.60 (Block Scholes Valuation model) indicate that option is underpriced, hence worth buying.

- (ii) If the current price is taken as ₹ 380 the computations are as follows:

$$d_1 = \frac{\ln\left(\frac{380}{400}\right) + \left[.05 + \frac{1}{2} (.22)^2\right] .25}{.22 \sqrt{.25}} = \frac{-0.05129 + .01855}{.11} = -0.297636$$

$$d_2 = \frac{\ln\left(\frac{380}{400}\right) + \left[.05 - \frac{1}{2} (.22)^2\right] .25}{.22 \sqrt{.25}} = \frac{-0.05129 + .00645}{.11} = -0.407666$$

$$V_o = V_s N(d_1) - \frac{E}{e^{rt}} N(d_2)$$

$$N(d_1) = N(-0.297636) = .3830$$

$$N(d_2) = N(-0.407666) = .3418$$

$$380 (.3830) - \frac{400}{e^{(.05)(.25)}} \times (.3418)$$

$$145.54 - \frac{400}{1.012578} (.3418) = 145.54 - 138.4397 = ₹ 7.10$$

- (iii) Value of call option = ₹ 7.10

Current Market Value = ₹ 415

$$\text{Present Value of Exercise Price} = \frac{400}{1.0125} = 395.06$$

$$V_p = -V_s + V_s + PV (E)$$

$$V_p = -380 + 7.10 + 395.06 = 22.16 = ₹ 22.16 \text{ Ans}$$

5.50 Strategic Financial Management

- (iv) Since dividend is expected to be paid in two months' time we have to adjust the share price and then use Block Scholes model to value the option:

Present Value of Dividend (using continuous discounting) = Dividend $\times e^{-rt}$

$$= ₹ 10 \times e^{-.05 \times .1666}$$

$$= ₹ 10 \times e^{-.008333}$$

$$= ₹ 9.917 \text{ (Please refer Exponential Table)}$$

Adjusted price of shares is ₹ 408 – 9.917 = ₹ 398.083

This can be used in Block Scholes model

$$d_1 = \frac{\ln\left(\frac{398.083}{400}\right) + \left[.05 + \frac{1}{2} (.22)^2\right] .25}{.22 \sqrt{.25}} = \frac{-.00480 + .01855}{.11} = .125$$

$$d_2 = \frac{\ln\left(\frac{398.083}{400}\right) + \left[.05 - \frac{1}{2} (.22)^2\right] .25}{.22 \sqrt{.25}} = \frac{-.00480 + .00645}{.11} = .015$$

$$N(d_1) = N(.125) = .5498$$

$$N(d_2) = N(.015) = .5060$$

$$\text{Value of Option} = 398.083 (.5498) - \frac{400}{e^{(.05)(.25)}} (.5060)$$

$$218.866 - \frac{400}{e^{.0125}} (.5060)$$

$$218.866 - \frac{400}{1.012578} (.5060) = 218.866 - 199.8858 = ₹ 18.98$$

11.9 Greeks: The Greeks are a collection of statistical values (expressed as percentages) that give the investor a better overall view of how a stock has been performing. These statistical values can be helpful in deciding what options strategies are best to use. The investor should remember that statistics show trends based on past performance. It is not guaranteed that the future performance of the stock will behave according to the historical numbers. These trends can change drastically based on new stock performance.

Before we discuss these statistical measures let us discuss the factors that affects the value of option as these statistical measures are related to changes in these factors.

Factors Affecting Value of an Option

There are a number of different mathematical formulae, or models, that are designed to compute the fair value of an option. You simply input all the variables (stock price, time, interest rates, dividends and future volatility), and you get an answer that tells you what an option should be worth. Here are the general effects the variables have on an option's price:

(a) Price Movement of the Underlying: The value of calls and puts are affected by changes in the underlying stock price in a relatively straightforward manner. When the stock price goes up, calls should gain in value and puts should decrease. Put options should increase in value and calls should drop as the stock price falls.

(b) Time till expiry: The option's future expiry, at which time it may become worthless, is an important and key factor of every option strategy. Ultimately, time can determine whether your option trading decisions are profitable. To make money in options over the long term, you need to understand the impact of time on stock and option positions.

With stocks, time is a trader's ally as the stocks of quality companies tend to rise over long periods of time. But time is the enemy of the options buyer. If days pass without any significant change in the stock price, there is a decline in the value of the option. Also, the value of an option declines more rapidly as the option approaches the expiration day. That is good news for the option seller, who tries to benefit from time decay, especially during that final month when it occurs most rapidly.

(c) Volatility in Stock Prices: Volatility can be understood via a measure called statistical (sometimes called historical) volatility, or SV for short. SV is a statistical measure of the past price movements of the stock; it tells you how volatile the stock has actually been over a given period of time.

But to give you an accurate fair value for an option, option pricing models require you to put in what the future volatility of the stock will be during the life of the option. Naturally, option traders don't know what that will be, so they have to try to guess. To do this, they work the options pricing model "backwards" (to put it in simple terms). After all, you already know the price at which the option is trading; you can also find the other variables (stock price, interest rates, dividends, and the time left in the option) with just a bit of research. So the only missing number is future volatility, which you can calculate from the equation.

(d) Interest Rate- Another feature which affects the value of an Option is the time value of money. The greater the interest rates, the present value of the future exercise price are less.

Now let us discuss these measures:

11.9.1 Delta : A by-product of the Black-Scholes model is the calculation of the delta. It is the degree to which an option price will move given a small change in the underlying stock price. For example, an option with a delta of 0.5 will move half a rupee for every full rupee movement in the underlying stock.

A deeply out-of-the-money call will have a delta very close to zero; a deeply in-the-money call will have a delta very close to 1.

The formula for a delta of a European call on a non-dividend paying stock is:

Delta = $N(d_1)$ (see Black-Scholes formula above for d_1)

Call deltas are positive; put deltas are negative, reflecting the fact that the put option price and the underlying stock price are inversely related. The put delta equals the call delta - 1.

5.52 Strategic Financial Management

The delta is often called the hedge ratio: If you have a portfolio short 'n' options (e.g. you have written n calls) then n multiplied by the delta gives you the number of shares (i.e. units of the underlying) you would need to create a riskless position - i.e. a portfolio which would be worth the same whether the stock price rose by a very small amount or fell by a very small amount. In such a "delta neutral" portfolio any gain in the value of the shares held due to a rise in the share price would be exactly offset by a loss on the value of the calls written, and vice versa.

Note that as the delta changes with the stock price and time to expiration the number of shares would need to be continually adjusted to maintain the hedge. How quickly the delta changes with the stock price are given by gamma.

In addition to delta there are some other "Greeks" which some find useful when constructing option strategies.

11.9.2 Gamma: It measures how fast the delta changes for small changes in the underlying stock price. i.e. the delta of the delta. If you are hedging a portfolio using the delta-hedge technique described under "Delta", then you will want to keep gamma as small as possible, the smaller it is the less often you will have to adjust the hedge to maintain a delta neutral position. If gamma is too large, a small change in stock price could wreck your hedge. Adjusting gamma, however, can be tricky and is generally done using options.

11.9.3 Theta: The change in option price given a one day decrease in time to expiration. Basically, it is a measure of time decay. Unless you and your portfolio are travelling at close to the speed of light the passage of time is constant and inexorable. Thus, hedging a portfolio against time decay, the effects of which are completely predictable, would be pointless.

11.9.4 Rho: The change in option price given a one percentage point change in the risk-free interest rate. It is sensitivity of option value to change in interest rate. Rho indicates the absolute change in option value for a one percent change in the interest rate. For example, a Rho of .060 indicates the option's theoretical value will increase by .060 if the interest rate is decreased by 1.0.

11.9.5 Vega: Sensitivity of option value to change in volatility. Vega indicates an absolute change in option value for a one percent change in volatility. For example, a Vega of .090 indicates an absolute change in the option's theoretical value will increase by .090 if the volatility percentage is increased by 1.0 or decreased by .090 if the volatility percentage is decreased by 1.0. Results may not be exact due to rounding. It can also be stated as the change in option price given a one percentage point change in volatility. Like delta and gamma, Vega is also used for hedging.

11.10 Options Strategies: Although there can be many possible option strategies, however, some of the important strategies are as follows:

11.10.1. Calendar Spreads: The calendar spread refers to a family of spreads involving options of the same **underlying stock**, same **strike prices**, but different **expiration months**. They can be created with either all **calls** or all **puts**. Also known as time spread or horizontal spread. The idea behind the calendar spread is to sell time, which is why calendar spreads are also known as time spreads.

Meaning of Spread: As per Investopedia, spread is a position consisting of the purchase of an option and the sale of another option on the same underlying security within different strike or expiration date.

Various types of calendar spreads which can be applied under various market scenarios are described as under:-

Bullish Market Scenario:-

- **Bull Call Spread:** The bull call spread option trading strategy is employed when the options trader thinks that the price of the underlying asset will go up moderately in the near term. Bull call spreads can be implemented by buying an at-the-money call option while simultaneously writing a higher striking out-of-the-money call option. By shorting the out-of-the-money call, the options trader reduces the cost of establishing the bullish position but forgoes the chance of making a large profit in the event that the underlying asset price skyrockets. The bull call spread option strategy is also known as the bull call debit spread as a debit is taken upon entering the trade.
- **Bull Put Spread:** The bull put spread option trading strategy is employed when the options trader thinks that the price of the underlying asset will go up moderately in the near term. The bull put spread options strategy is also known as the bull put credit spread as a credit is received upon entering the trade. Bull put spreads can be implemented by selling a higher striking in-the-money put option and buying a lower striking out-of-the-money put option on the same underlying stock with the same expiration date.
- **Bull Calendar Spread:** Using calls, the bull calendar spread strategy can be setup by buying long term slightly out-of-the-money calls and simultaneously writing an equal number of near month calls of the same underlying security with the same strike price. The options trader applying this strategy is bullish for the long term and is selling the near month calls with the intention to ride the long term calls for free.
- **Diagonal Bull Call Spread:** The diagonal bull call spread strategy involves buying long term calls and simultaneously writing an equal number of near-month calls of the same underlying stock with a higher strike. This strategy is typically employed when the options trader is bullish on the underlying stock over the longer term but is neutral to mildly bullish in the near term.

Bearish Market Scenario

- **Bear Call Spread:-** The bear call spread option trading strategy is employed when the options trader thinks that the price of the underlying asset will go down moderately in the near term.
The bear call spread option strategy is also known as the bear call credit spread as a credit is received upon entering the trade. Bear call spreads can be implemented by buying call options of a certain strike price and selling the same number of call options of lower strike price on the same underlying security expiring in the same month.
- **Bear Put Spread:-** The bear put spread option trading strategy is employed when the options trader thinks that the price of the underlying asset will go down moderately in the near term.

5.54 Strategic Financial Management

Bear put spreads can be implemented by buying a higher striking in-the-money put option and selling a lower striking out-of-the-money put option of the same underlying security with the same expiration date.

By shorting the out-of-the-money put, the options trader reduces the cost of establishing the bearish position but forgoes the chance of making a large profit in the event that the underlying asset price plummets. The bear put spread options strategy is also known as the bear put debit spread as a debit is taken upon entering the trade.

- **Diagonal Bear Put Spread:-** The diagonal bear put spread strategy involves buying long-term puts and simultaneously writing an equal number of near-month puts of the same underlying stock with a lower strike.

This strategy is typically employed when the options trader is bearish on the underlying stock over the longer term but is neutral to mildly bearish in the near term

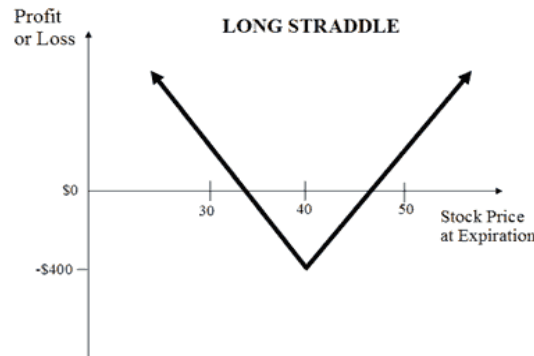
11.10.2 Straddles: An options strategy with which the investor holds a position in both a call and put with the same strike price and expiration date. Straddles are a good strategy to pursue if an investor believes that a stock's price will move significantly but is unsure as to which direction. The stock price must move significantly if the investor is to make a profit. As shown in the diagram below, should only a small movement in price occur in either direction, the investor will experience a loss. As a result, a straddle is extremely risky to perform. Additionally, on stocks that are expected to jump, the market tends to price options at a higher premium, which ultimately reduces the expected payoff should the stock move significantly. This is a good strategy if you think there will be a large price movement in the near future but is unsure of which way that price movement will be. It has one common strike price. In India straddles are mostly used by traders on Index Options during major political events such as general elections or annual budget when they expect a major movement in the Index but are not sure of the direction in which the Index would move.

Pay off Diagram for Straddle: -

Suppose XYZ stock is trading at \$40 in June. An options trader enters a long straddle by buying a JUL 40 put for \$200 and a JUL 40 call for \$200. The net debit taken to enter the trade is \$400, which is also his maximum possible loss.

If XYZ stock is trading at \$50 on expiration in July, the JUL 40 put will expire worthless but the JUL 40 call expires in the money and has an intrinsic value of \$1000 (Assuming of lot of option contract contains 100 shares of XYZ) . Subtracting the initial debit of \$400, the long straddle trader's profit comes to \$600.

On expiration in July, if XYZ stock is still trading at \$40, both the JUL 40 put and the JUL 40 call expire worthless and the long straddle trader suffers a maximum loss which is equal to the initial debit of \$400 taken to enter the trade.

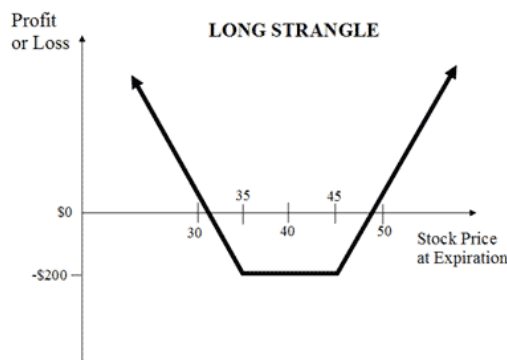


11.10.3 Strangle: The strategy involves buying an out-of-the-money call and an out-of-the-money put option. A strangle is generally less expensive than a straddle as the contracts are purchased out of the money. Strangle is an unlimited profit, limited risk strategy that is taken when the options trader thinks that the underlying stock will experience significant volatility in the near term. It has two different strike prices.

Suppose XYZ stock is trading at \$40 in June. An options trader executes a strangle by buying a JUL 35 put for \$100 and a JUL 45 call for \$100. The net debit taken to enter the trade is \$200, which is also his maximum possible loss.

If XYZ stock rallies and is trading at \$50 on expiration in July, the JUL 35 put will expire worthless but the JUL 45 call expires in the money and has an intrinsic value of \$500 (Assuming one lot of option contract has 50 shares). Subtracting the initial debit of \$200, the options trader's profit comes to \$300.

On expiration in July, if XYZ stock is still trading at \$40, both the JUL 35 put and the JUL 45 call expire worthless and the options trader suffers a maximum loss which is equal to the initial debit of \$200 taken to enter the trade.



Pay off Diagram for Strangle

11.10.4. Butterfly Spreads: The butterfly spread is a neutral strategy that is a combination of a bull spread and a bear spread. It is a limited profit, limited risk options strategy. There are

3 striking prices involved in a butterfly spread and it can be constructed using calls or puts. This strategy has limited risk and limited profit.

Types of Butterfly Spreads

(i) *Long Call Butterfly*: - Long butterfly spreads are entered when the investor thinks that the **underlying** stock will not rise or fall much by expiration. Using calls, the long butterfly can be constructed by buying one lower striking **in-the-money call**, writing two **at-the-money** calls and buying another higher striking **out-of-the-money call**. A resulting net debit is taken to enter the trade.

(ii) *Short Call Butterfly*: - Using calls, the short call butterfly can be constructed by selling one lower strike price in-the-money call, buying two at-the-money calls and selling another higher strike price out-of-the-money call, giving the trader a net credit to enter the position.

(iii) *Long Put Butterfly*: - The long put butterfly spread is a limited profit, limited risk options trading strategy that is taken when the options trader thinks that the underlying security will not rise or fall much by expiration. There are 3 **strike prices** involved in a long put butterfly spread and it is constructed by buying one lower strike price put, selling two at-the-money puts and buying another higher strike price put for a net debit.

(iv) *Short Put Butterfly*: - The short put butterfly is a neutral strategy like the **long put butterfly** but bullish on volatility. It is a limited profit, limited risk options strategy. There are 3 **strike prices** involved in a short put butterfly and it can be constructed by selling one lower strike price **out-of-the-money put**, buying two **at-the-money** puts and selling another higher strike price **in-the-money put**, giving the options trader a net credit to put on the trade.

(v) *Iron Butterfly*: - The iron butterfly spread is a limited risk, limited profit trading strategy that is structured for a larger probability of earning a smaller limited profit when the **underlying stock** is perceived to have a low volatility. To setup an iron butterfly, the options trader buys a lower strike price **out-of-the-money put**, sells a middle strike price **at-the-money put**, sells a middle strike at-the-money **call** and buys another higher strike **out-of-the-money call**. This results in a net credit to enter into the trade.

(vi) *Reverse Iron Butterfly*: - The reverse (short) iron butterfly is a limited risk, limited profit options trading strategy that is designed to make a profit when the **underlying stock** price makes a sharp move either up or down. To setup a reverse iron butterfly, the options trader sells a lower strike price **out-of-the-money put**, buys a middle strike price **at-the-money put**, buys another middle strike price at-the-money **call** and sells another higher strike price **out-of-the-money call**. There will be a net debit taken to enter into the trade.

12. Commodity Derivatives

As defined by the "Chicago Board of Trade", Commodity is something that has an economic value and can be used for commerce. This can be sold or purchased and movable. Broadly, commodities can be classified in the following two categories:

(i) Hard Commodities

(ii) Soft Commodities

While hard commodities are mined from the ground or extracted from other natural resources, soft commodities are mainly agricultural commodities.

Examples of hard commodities are precious metals such as gold, silver as well as base metals i.e. copper, nickels, aluminum, steel etc. Energy products such as crude oil, natural gas heating gas and coal all fall in this category.

Examples of soft commodities are cereals and pulses, spices, cotton, oilseed, rubber etc.

Trading in commodity derivatives first started to protect farmers from the risk of the value of their crop going below the cost price of their produce. Derivative contracts were offered on various agricultural products like cotton, rice, coffee, wheat, pepper etc.

The first organized exchange, the Chicago Board of Trade (CBOT) -- with standardized contracts on various commodities -- was established in 1848. In 1874, the Chicago Produce Exchange - which is now known as Chicago Mercantile Exchange (CME) was formed.

CBOT and CME are two of the largest commodity derivatives exchanges in the world.

12.1 Necessary Conditions to Introduce Commodity Derivatives: The commodity characteristic approach defines feasible commodities for derivatives trading based on an extensive list of required commodity attributes. It focuses on the technical aspects of the underlying commodity. The following attributes are considered crucial for qualifying for the derivatives trade: 1) a commodity should be durable and it should be possible to store it; 2) units must be homogeneous; 3) the commodity must be subject to frequent price fluctuations with wide amplitude; supply and demand must be large; 4) supply must flow naturally to market and there must be breakdowns in an existing pattern of forward contracting.

The first attribute, durability and storability, has received considerable attention in commodity finance, since one of the economic functions often attributed to commodity derivatives markets is the temporal allocation of stocks. The commodity derivatives market is an integral part of this storage scenario because it provides a hedge against price risk for the carrier of stocks.

Since commodity derivatives contracts are standardized contracts, this approach requires the underlying product to be homogeneous, the second attribute, so that the underlying commodity as defined in the commodity derivatives contract corresponds with the commodity traded in the cash market. This allows for actual delivery in the commodity derivatives market.

The third attribute, a fluctuating price, is of great importance, since firms will feel little incentive to insure themselves against price risk if price changes are small. A broad cash market is important because a large supply of the commodity will make it difficult to establish dominance in the market place and a broad cash market will tend to provide for a continuous and orderly meeting of supply and demand forces.

The last crucial attribute, breakdowns in an existing pattern of forward trading, indicates that cash market risk will have to be present for a commodity derivatives market to come into existence. Should all parties decide to eliminate each and every price fluctuation by using cash forward contracts for example, a commodity derivatives market would be of little interest.

5.58 Strategic Financial Management

A commodity derivative must reflect the commercial movement of a commodity both loosely and broadly enough, so that price distortions will not be a result of specifications in the contract. To warrant hedging, the contract must be as close a substitute for the cash commodity as possible. Hedging effectiveness is an important determinant in explaining the success of commodity derivatives and as a result considerable attention has been paid to the hedging effectiveness of commodity derivatives.

The total set of customer needs concerning commodity derivatives is differentiated into instrumental needs and convenience needs (see Figure 1). Customers will choose that “service-product” (futures, options, cash forwards, etc.) which best satisfy their needs, both instrumental and convenience, at an acceptable price.

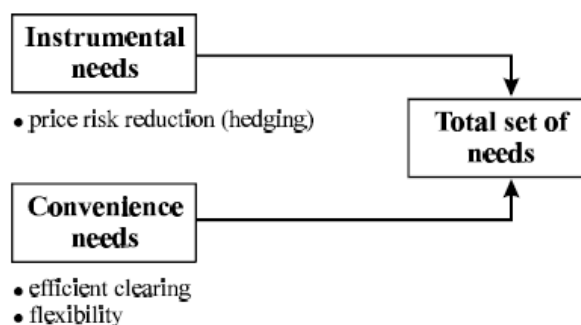


Figure 1

Instrumental needs are the hedgers' needs for price risk reduction. Hedgers wish to reduce, or, if possible, eliminate portfolio risks at low cost. The instrumental needs are related to the core service of the commodity derivatives market, which consists of reducing price variability to the customer. Not only do hedgers wish to reduce price risk, they also desire flexibility in doing business, easy access to the market, and an efficient clearing system. These needs are called convenience needs. They deal with the customer's need to be able to use the core service provided by the exchange with relative ease. The extent to which the commodity derivatives exchange is able to satisfy convenience needs determines the process quality. The service offering is not restricted to the core service, but has to be complemented by so-called peripheral services

12.2 Investing in Commodity Derivatives: Commodity derivatives, which were traditionally developed for risk management purposes, are now growing in popularity as an investment tool. Most of the trading in the commodity derivatives market is being done by people who have no need for the commodity itself.

They just speculate on the direction of the price of these commodities, hoping to make money if the price moves in their favour.

The commodity derivatives market is a direct way to invest in commodities rather than investing in the companies that trade in those commodities.

For example, an investor can invest directly in a steel derivative rather than investing in the shares of Tata Steel. It is easier to forecast the price of commodities based on their demand

and supply forecasts as compared to forecasting the price of the shares of a company which depend on many other factors than just the demand and supply of the products they manufacture and sell or trade in.

Also, derivatives are much cheaper to trade in as only a small sum of money is required to buy a derivative contract.

Let us assume that an investor buys a tonne of soybean for ₹ 8,700 in anticipation that the prices will rise to ₹ 9,000 by June 30, 2013. He will be able to make a profit of ₹ 300 on his investment, which is 3.4%. Compare this to the scenario if the investor had decided to buy soybean futures instead.

Before we look into how investment in a derivative contract works, we must familiarise ourselves with the buyer and the seller of a derivative contract. A buyer of a derivative contract is a person who pays an initial margin to buy the right to buy or sell a commodity at a certain price and a certain date in the future.

On the other hand, the seller accepts the margin and agrees to fulfill the agreed terms of the contract by buying or selling the commodity at the agreed price on the maturity date of the contract.

Now let us say the investor buys soybean futures contract to buy one tonne of soybean for ₹ 8,700 (exercise price) on November 30, 2013. The contract is available by paying an initial margin of 10%, i.e. ₹ 870. Note that the investor needs to invest only ₹ 870 here.

On November 30, 2013, the price of soybean in the market is, say, ₹ 9,000 (known as Spot Price -- Spot Price is the current market price of the commodity at any point in time).

The investor can take the delivery of one tonne of soybean at ₹ 8,700 and immediately sell it in the market for ₹ 9,000, making a profit of ₹ 300. So the return on the investment of ₹ 870 is 34.5%. On the contrary, if the price of soybean drops to ₹ 8,400 the investor will end up making a loss of 34.5%.

If the investor wants, instead of taking the delivery of the commodity upon maturity of the contract, an option to settle the contract in cash also exists. Cash settlement comprises exchange of the difference in the spot price of the commodity and the exercise price as per the futures contract.

At present, the option of cash settlement lies only with the seller of the contract. If the seller decides to make or take delivery upon maturity, the buyer of the contract has to fulfill his obligation by either taking or making delivery of the commodity, depending on the specifications of the contract.

In the above example, if the seller decides to go for cash settlement, the contract can be settled by the seller by paying ₹ 300 to the buyer, which is the difference in the spot price of the commodity and the exercise price. Once again, the return on the investment of ₹ 870 is 34.5%.

The above example shows that with very little investment, the commodity futures market offers scope to make big bucks. However, trading in derivatives is highly risky because just as there are high returns to be earned if prices move in favour of the investors, an unfavourable move results in huge losses.

5.60 Strategic Financial Management

The most critical function in a commodity derivatives exchange is the settlement and clearing of trades. Commodity derivatives can involve the exchange of funds and goods. The exchanges have a separate body to handle all the settlements, known as the clearing house.

For example, the holder of a futures contract to buy soybean might choose to take delivery of soya bean rather than closing his position before maturity. The function of the clearing house or clearing organisation, in such a case, is to take care of possible problems of default by the other party involved by standardising and simplifying transaction processing between participants and the organisation.

Certain special characteristics/benefits of Commodity derivatives trading are:

- ❖ To complement investment in companies that use commodities;
- ❖ To invest in a country's consumption and production;
- ❖ No dividends, only returns from price increases.

In spite of the surge in the turnover of the commodity exchanges in recent years, a lot of work in terms of policy liberalisation, setting up the right legal system, creating the necessary infrastructure, large-scale training programs, etc. still needs to be done in order to catch up with the developed commodity derivative markets.

12.3 Commodity Market: Commodity markets in a crude early form are believed to have originated in Sumer where small baked clay tokens in the shape of sheep or goats were used in trade. Sealed in clay vessels with a certain number of such tokens, with that number written on the outside, they represented a promise to deliver that number.

In modern times, commodity markets represent markets where raw or primary products are exchanged. These raw commodities are traded on regulated, commodity exchanges in which they are bought and sold in standardized contracts.

Some of the advantages of commodity markets are:

- ❖ Most money managers prefer derivatives to tangible commodities;
- ❖ Less hassle (delivery, etc);
- ❖ Allows indirect investment in real assets that could provide an additional hedge against inflation risk.

12.4 Commodity Futures: Almost all the commodities were allowed to be traded in the futures market from April 2003. To make trading in commodity futures more transparent and successful, multi-commodity exchanges at national level were also conceived and these next generation exchanges were allowed to start futures trading in commodities on-line.

The process of trading commodities is also known as futures trading. Unlike other kinds of investments, such as stocks and bonds, when you trade futures, you do not actually buy anything or own anything. You are speculating on the future direction of the price in the commodity you are trading. This is like a bet on future price direction. The terms "buy" and "sell" merely indicate the direction you expect future prices will take.

If, for instance, you were speculating in corn, you would buy a futures contract if you thought the price would be going up in the future. You would sell a futures contract if you thought the price would go down. For every trade, there is always a buyer and a seller. Neither person has to own any corn to participate. He must only deposit sufficient capital with a brokerage firm to insure that he will be able to pay the losses if his trades lose money.

On one side of a transaction may be a producer like a farmer. He has a field full of corn growing on his farm. It won't be ready for harvest for another three months. If he is worried about the price going down during that time, he can sell futures contracts equivalent to the size of his crop and deliver his corn to fulfill his obligation under the contract. Regardless of how the price of corn changes in the three months until his crop will be ready for delivery, he is guaranteed to be paid the current price.

On the other side of the transaction might be a producer such as a cereal manufacturer who needs to buy lots of corn. The manufacturer, such as Kellogg, may be concerned that in the next three months the price of corn will go up, and it will have to pay more than the current price. To protect against this, Kellogg can buy futures contracts at the current price. In three months Kellogg can fulfill its obligation under the contracts by taking delivery of the corn. This guarantees that regardless of how the price moves in the next three months, Kellogg will pay no more than the current price for its commodity.

In addition to agricultural commodities, there are futures for financial instruments and intangibles such as currencies, bonds and stock market indexes. Each futures market has producers and consumers who need to hedge their risk from future price changes. The speculators, who do not actually deal in the physical commodities, are there to provide liquidity. This maintains an orderly market where price changes from one trade to the next are small.

Rather than taking delivery or making delivery, the speculator merely offsets his position at some time before the date set for future delivery. If price has moved in the right direction, he will profit. If not, he will lose.

Advantages of Commodity Futures

Some of the advantages of commodity futures are:

- Easiest and cheapest way to invest in commodities
- 3 Major Categories like Agricultural products (soft commodities) –fibers, grains, food, livestock; Energy – crude oil, heating oil, natural gas; and Metals – copper, aluminum, gold, silver, platinum

12.5 Commodity Swaps: Producers need to manage their exposure to fluctuations in the prices for their commodities. They are primarily concerned with fixing prices on contracts to sell their produce. A gold producer wants to hedge his losses attributable to a fall in the price of gold for his current gold inventory. A cattle farmer wants to hedge his exposure to changes in the price of his livestock.

5.62 Strategic Financial Management

End-users need to hedge the prices at which they can purchase these commodities. A university might want to lock in the price at which it purchases electricity to supply its air conditioning units for the upcoming summer months. An airline wants to lock in the price of the jet fuel it needs to purchase in order to satisfy the peak in seasonal demand for travel.

Speculators are funds or individual investors who can either buy or sell commodities by participating in the global commodities market. While many may argue that their involvement is fundamentally destabilizing, it is the liquidity they provide in normal markets that facilitates the business of the producer and of the end-user.

Why would speculators look at the commodities markets? Traditionally, they may have wanted a hedge against inflation. If the general price level is going up, it is probably attributable to increases in input prices. Or, speculators may see tremendous opportunity in commodity markets. Some analysts argue that commodity markets are more technically-driven or more likely to show a persistent trend.

12.5.1 Types of Commodity Swaps: There are two types of commodity swaps: fixed-floating or commodity-for-interest.

(a) Fixed-Floating Swaps: They are just like the fixed-floating swaps in the interest rate swap market with the exception that both indices are commodity based indices.

General market indices in the international commodities market with which many people would be familiar include the S&P Goldman Sachs Commodities Index (S&PGSCI) and the Commodities Research Board Index (CRB). These two indices place different weights on the various commodities so they will be used according to the swap agent's requirements.

(b) Commodity-for-Interest Swaps: They are similar to the equity swap in which a total return on the commodity in question is exchanged for some money market rate (plus or minus a spread).

12.5.2 Valuing Commodity Swaps: In pricing commodity swaps, we can think of the swap as a strip of forwards, each priced at inception with zero market value (in a present value sense). Thinking of a swap as a strip of at-the-money forwards is also a useful intuitive way of interpreting interest rate swaps or equity swaps.

Commodity swaps are characterized by some peculiarities. These include the following factors for which we must account:

- (i) The cost of hedging;
- (ii) The institutional structure of the particular commodity market in question;
- (iii) The liquidity of the underlying commodity market;
- (iv) Seasonality and its effects on the underlying commodity market;
- (v) The variability of the futures bid/offer spread;
- (vi) Brokerage fees; and
- (vii) Credit risk, capital costs and administrative costs.

Some of these factors must be extended to the pricing and hedging of interest rate swaps, currency swaps and equity swaps as well. The idiosyncratic nature of the commodity markets refers more to the often limited number of participants in these markets (naturally begging questions of liquidity and market information), the unique factors driving these markets, the inter-relations with cognate markets and the individual participants in these markets.

12.6 Hedging with Commodity Derivatives: Many times when using commodity derivatives to hedge an exposure to a financial price, there is not one exact contract that can be used to hedge the exposure. If you are trying to hedge the value of a particular type of a refined chemical derived from crude oil, you may not find a listed contract for that individual product. You will find an over-the-counter price if you are lucky.

They look at the correlation (or the degree to which prices in the individual chemical trade with respect to some other more liquid object, such as crude oil) for clues as to how to price the OTC product that they offer you. They make assumptions about the stability of the correlation and its volatility and they use that to "shade" the price that they show you.

Correlation is an un-hedgable risk for the OTC market maker, though. There is very little that he can do if the correlation breaks down.

For example, if all of a sudden the price for your individual chemical starts dropping faster than the correlation of the chemical's price with crude oil suggests it should, the OTC dealer has to start dumping more crude oil in order to compensate.

It is a very risky business. The OTC market maker's best hope is to see enough "two-way" business involving end-users and producers so that his exposure is "naturally" hedged by people seeking to benefit from price movement in either direction.

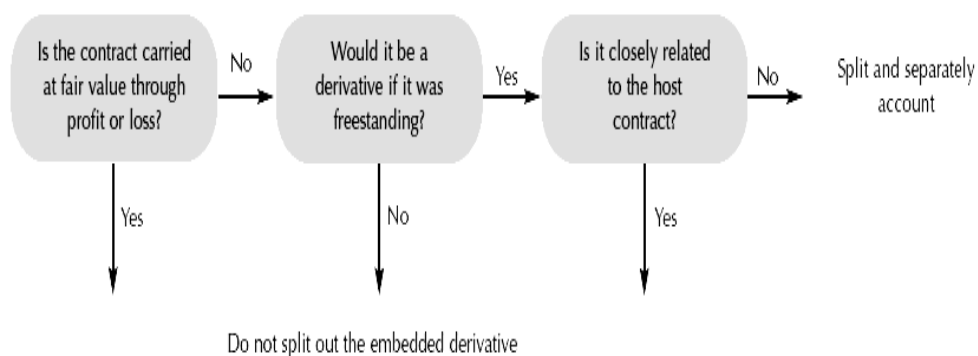
Commodity swaps and commodity derivatives are a useful and important tool employed by most leading energy, chemical and agricultural corporations in today's world.

13. Embedded Derivatives

An embedded derivative is a derivative instrument that is embedded in another contract - the host contract. The host contract might be a debt or equity instrument, a lease, an insurance contract or a sale or purchase contract. Derivatives require being marked-to-market through the income statement, other than qualifying hedging instruments. This requirement on embedded derivatives are designed to ensure that mark-to-market through the income statement cannot be avoided by including - embedding - a derivative in another contract or financial instrument that is not marked-to market through the income statement.

A coal purchase contract may include a clause that links the price of the coal to a pricing formula based on the prevailing electricity price or a related index at the date of delivery. The coal purchase contract, which qualifies for the executory contract exemption, is described as the host contract, and the pricing formula is the embedded derivative. The pricing formula is an embedded derivative because it changes the price risk from the coal price to the electricity price.

5.64 Strategic Financial Management



An embedded derivative that modifies an instrument's inherent risk (such as a fixed to floating interest rate swap) would be considered closely related. Conversely, an embedded derivative that changes the nature of the risks of a contract is not closely related.

Most equity- or commodity-linked features embedded in a debt instrument will not be closely related. This includes puts that force the issuer to reacquire an instrument based on changes in commodity price or index, equity or commodity indexed interest or principal payments and equity conversion features. Puts or calls on equity instruments at specified prices (that is, not market on date of exercise) are seldom closely related, neither are calls, puts or prepayment penalties on debt instruments. Credit derivatives embedded in a host debt instrument are seldom closely related to it.

The economic characteristics and risks of an embedded derivative are closely related to the economic characteristics and risks of the host contract when the host contract is a debt instrument and the embedded derivative is an interest rate floor or a cap out of the money when the instrument is issued. An entity would not account for the embedded derivative separately from the host contract. The same principle applies to caps and floors in a sale or purchase contract.

Closely related- Examples of embedded derivatives that need not be separated

- A derivative embedded in a host lease contract is closely related to the host contract if the embedded derivative comprises contingent rentals based on related sales;
- An inflation index term in a debt instrument as long as it is not leveraged and relates to the inflation index in the economic environment in which the instrument is denominated or issued;
- Not closely related- Examples of embedded derivatives that must be separated
- Equity conversion feature embedded in a debt instrument e.g. investment in convertible bonds;
- Option to extend the term of a debt instrument unless there is a concurrent adjustment of the interest rate to reflect market prices;
- Equity-indexed interest embedded in a debt instrument.

PART C : OTC DERIVATIVES

14. Introduction to Over-the-Counter (OTC) Derivatives

As you are aware that a derivative is a risk-shifting agreement, the value of which is derived from the value of an *underlying asset*. The underlying asset could be a physical commodity, an interest rate, a company's stock, a stock index, a currency, or virtually any other tradable instrument upon which two parties can agree. One of the categories of derivatives is known as OTC derivatives.

Derivatives are traded in two kinds of markets: exchanges and OTC markets.

An OTC derivative is a derivative contract which is privately negotiated. OTC trades have no anonymity, and they generally do not go through a clearing corporation. Every derivative product can either be traded on OTC (i.e., through private negotiation), or on an exchange. In one specific case, the jargon demarcates this clearly: OTC futures contracts are called 'forwards' (or exchange-traded forwards are called 'futures'). In other cases, there is no such distinguishing notation. There are 'exchange-traded options' as opposed to 'OTC options', but they are both called options.

15. OTC Interest Rate Derivatives

OTC interest rate derivatives include instruments such as forward rate agreements (FRAs), interest rate swaps, caps, floors, and collars. Like exchange-traded interest rate derivatives such as interest rate futures and futures options, OTC interest rate derivatives set terms for the exchange of cash payments based on changes in market interest rates. An FRA is a forward contract that sets terms for the exchange of cash payments based on changes in the London Interbank Offered Rate (LIBOR); interest rate swaps provide for the exchange of payments based on differences between two different interest rates; and interest rate caps, floors, and collars are option-like agreements that require one party to make payments to the other when a stipulated interest rate, most often a specified maturity of LIBOR, moves outside of some predetermined range.

The over-the-counter market differs from futures markets in a number of important respects. Whereas futures and futures options are standardized agreements that trade on organized exchanges, the OTC market is an informal market consisting of dealers, or market makers, who trade price information and negotiate transactions over electronic communications networks. Although a great deal of contract standardization exists in the over-the-counter market, dealers active in this market customise agreements to meet the specific needs of their customers. And unlike futures markets, where futures exchange clearinghouses guarantee contract performance through a system of margin requirements combined with the daily settlement of gains or losses, counterparties to OTC derivative agreements must bear some default or credit risk.

The rapid growth and energized pace of innovation in the market for interest rate derivatives since 1981, the date of the first widely publicized swap agreement, has proven truly phenomenal. The advent of trading in interest rate swaps was soon followed by FRAs, caps,

5.66 Strategic Financial Management

floors, collars, as well as other hybrid instruments such as forward swaps, options on swaps (swaptions), and even options on options (captions).

15.1 Forward Rate Agreements: A Forward Rate Agreement (FRA) is an agreement between two parties through which a borrower/ lender protects itself from the unfavourable changes to the interest rate. Unlike futures FRAs are not traded on an exchange thus are called OTC product. Following are main features of FRA.

- Normally it is used by banks to fix interest costs on anticipated future deposits or interest revenues on variable-rate loans indexed to LIBOR.
- It is an off Balance Sheet instrument.
- It does not involve any transfer of principal. The principal amount of the agreement is termed "notional" because, while it determines the amount of the payment, actual exchange of the principal never takes place.
- It is settled at maturity in cash representing the profit or loss. A bank that sells an FRA agrees to pay the buyer the increased interest cost on some "notional" principal amount if some specified maturity of LIBOR is above a stipulated "forward rate" on the contract maturity or settlement date. Conversely, the buyer agrees to pay the seller any decrease in interest cost if market interest rates fall below the forward rate.
- Final settlement of the amounts owed by the parties to an FRA is determined by the formula

$$\text{Payment} = \frac{(N)(RR - FR)(dtm/DY)}{[1 + RR(dt/DY)]} \times 100$$

Where,

N = the notional principal amount of the agreement;

RR = Reference Rate for the maturity specified by the contract prevailing on the contract settlement date; typically LIBOR or MIBOR

FR = Agreed-upon Forward Rate; and

dtm = maturity of the forward rate, specified in days (FRA Days)

DY = Day count basis applicable to money market transactions which could be 360 or 365 days.

If LIBOR > FR the seller owes the payment to the buyer, and if LIBOR < FR the buyer owes the seller the absolute value of the payment amount determined by the above formula.

- The differential amount is discounted at post change (actual) interest rate as it is settled in the beginning of the period not at the end.

Thus, buying an FRA is comparable to selling, or going short, a Eurodollar or LIBOR futures contract.

Example

Suppose two banks enter into an agreement specifying:

- a forward rate of 5 percent on a Eurodollar deposit with a three-month maturity;
- a \$1 million notional principal; and settlement in one month.

Such an agreement is termed a 1x4 FRA because it fixes the interest rate for a deposit to be placed after one month and maturing four months after the date the contract is negotiated.

If the three-month LIBOR is 6 percent on the contract settlement date, the seller would owe the buyer the difference between 6 and 5 percent interest on \$1 million for a period of 90 days.

Every 1 basis point change in the interest rate payable on a principal of \$1 million for a 90-day maturity changes interest cost by \$25, so that the increase in the interest cost on a three-month Eurodollar deposit over the specified forward rate in this case is $\$25 \times 100$ basis points = \$2,500.

The \$2,500 difference in interest costs calculated above is discounted back three months using the actual three-month LIBOR prevailing on the settlement date.

Thus, if 90-day LIBOR turns out to be 6 percent on the contract maturity date the buyer would receive $\$2,463.05 = \$2,500/[1 + 0.06(90/360)]$.

15.2 Interest Rate Swaps: A swap is a contractual agreement between two parties to exchange, or "swap," future payment streams based on differences in the returns to different securities or changes in the price of some underlying item. Interest rate swaps constitute the most common type of swap agreement. In an interest rate swap, the parties to the agreement, termed the swap counterparties, agree to exchange payments indexed to two different interest rates. Total payments are determined by the specified notional principal amount of the swap, which is never actually exchanged. Financial intermediaries, such as banks, pension funds, and insurance companies, as well as non-financial firms use interest rate swaps to effectively change the maturity of outstanding debt or that of an interest-bearing asset.

Swaps grew out of parallel loan agreements in which firms exchanged loans denominated in different currencies. Although some swaps were arranged in the late 1970s, the first widely publicized swap took place in 1981 when IBM and the World Bank agreed to exchange interest payments on debt denominated in different currencies, an arrangement known as a currency swap. The first interest rate swap in the world was a 1982 agreement in which the Student Loan Marketing Association (Sallie Mae) of US swapped the interest payments on an issue of intermediate-term, fixed-rate debt for floating-rate payments indexed to the three-month Treasury bill yield. The interest rate swap market has grown rapidly since then.

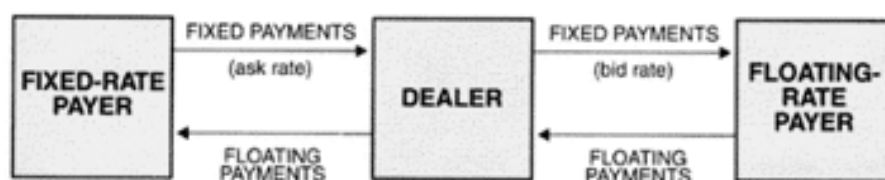
15.2.1 Swap Dealers: Early interest rate swaps were brokered transactions in which financial intermediaries with customers interested in entering into a swap would seek counterparties for the transaction among their other customers. The intermediary collected a brokerage fee as compensation, but did not maintain a continuing role once the transaction was completed. The contract was between the two ultimate swap users, who exchanged payments directly.

Today the market has evolved into more of a dealer market dominated by large international commercial and investment banks. Dealers act as market makers that stand ready to become counterparty to different swap transactions before a customer for the other side of the transaction is located. A swap dealer intermediates cash flows between different customers, or "end users," becoming a middleman to each transaction. The dealer market structure relieves end users from the need to monitor the financial condition of many different swap counterparties. Because dealers act as middlemen, end users need only be concerned with the financial condition of the dealer, and not with the creditworthiness of the other ultimate end user of the instrument.

Figure 2 illustrates the flow of payments between two swap end users through a swap dealer. Unlike brokers, dealers in the over-the-counter market do not charge a commission. Instead, they quote two-way "bid" and "asked" prices at which they stand ready to act as counterparty to their customers in a derivative instrument. The quoted spread between bid and asked prices allows an intermediary to receive a higher payment from one counter party than is paid to the other.

Figure 2

The Dealer Market for Interest Rate Swaps



15.2.2 Swap Market Conventions: There are many different variants of interest rate swaps. The most common is the fixed/floating swap in which a fixed-rate payer makes payments based on a long-term interest rate to a floating-rate payer, who, in turn, makes payments indexed to a short-term money market rate to the fixed-rate payer. A fixed/floating swap is characterized by:

- a fixed interest rate;
- a variable or floating interest rate which is periodically reset;
- a notional principal amount upon which total interest payments are based; and
- the term of the agreement, including a schedule of interest rate reset dates (that is, dates when the value of the interest rate used to determine floating-rate payments is determined) and payment dates.

The fixed interest rate typically is based on the prevailing market interest rate for Treasury securities with a maturity corresponding to the term of the swap agreement. The floating rate is most often indexed to three- or six-month LIBOR, in which case the swap is termed a "generic" or "plain vanilla" swap, but can be indexed to almost any money market rate such as the Treasury bill, commercial paper, federal funds, or prime interest rate. The maturity, or "tenor," of a fixed/floating interest rate swap can vary between 1 and 15 years. By convention, a fixed-rate payer is designated as the buyer and is said to be long the swap, while the floating-rate payer is the seller and is characterized as short the swap.

15.2.3 Timing of Payments: A swap is negotiated on its "trade date" and takes effect two days later on its initial "settlement date." If the agreement requires the exchange of cash at the outset, as in the case of a "no-par" swap, the transaction takes place on the initial settlement date. Interest begins accruing on the "effective date" of the swap, which usually coincides with the initial settlement date. (Forward swaps, in which the effective date of the swap is deferred, are an exception to this rule.) Floating-rate payments are adjusted on periodic "reset dates" based on the prevailing market-determined value of the floating-rate index, with subsequent payments made on a sequence of payment dates (also known as settlement dates) specified by the agreement. Typically, the reset frequency for the floating-rate index is the term of the interest rate index itself. For example, the floating rate on a generic swap indexed to the six-month LIBOR would, in most cases, be reset every six months with payment dates following six months later. The floating rate can be reset more frequently, however, as in the case of swaps indexed to Treasury bill rates, which are reset weekly.

Fixed interest payment intervals can be three months, six months, or one year. Semiannual payment intervals are most common because they coincide with the intervals between interest payments on Treasury bonds. Floating-rate payment intervals need not coincide with fixed-rate payment intervals, although they often do. When payment intervals coincide, it is common practice to exchange only the net difference between the fixed and floating payments.

15.2.4 Price Quotation: The price of a fixed/floating swap is quoted in two parts: a fixed interest rate and an index upon which the floating interest rate is based. The floating rate can be based on an index of short-term market rates (such as a given maturity of LIBOR) plus or minus a given margin, or set to the index "flat"—that is, the floating interest rate index itself with no margin added. The convention in the swap market is to quote the fixed interest rate as an All-In-Cost (AIC), which means that the fixed interest rate is quoted relative to a flat floating-rate index.

The AIC typically is quoted as a spread over Treasury securities with a maturity corresponding to the term of the swap. For example, a swap dealer might quote a price on a three-year generic swap at an All-In-Cost of "72-76 flat," which means the dealer stands ready to "buy" the swap (that is, enter into the swap as a fixed-rate payer) at 72 basis points over the prevailing three-year interest rate on Treasuries while receiving floating-rate payments indexed to a specified maturity of LIBOR with no margin, and "sell" (receive fixed and pay floating) if the other party to the swap agrees to pay 76 basis points over Treasury securities. Bid-asked spreads in the swap market vary greatly depending on the type of agreement. The spread can be as low as 3 to 4 basis points for a two- or three-year generic swap, while spreads for nonstandard, custom-tailored swaps tend to be much higher.

15.2.5 The Generic Swap (Plain Vanilla Swap): As an example of the mechanics of a simple interest rate swap, consider the example of a generic swap. Fixed interest payments on a generic swap typically are based on a 30/360 day-count convention, meaning that they are calculated assuming each month has 30 days and the quoted interest rate is based on a 360-day year. Given an All-In-Cost of the swap, the semiannual fixed-rate payment would be:

5.70 Strategic Financial Management

$$(N)(AIC)(180/360),$$

Where,

N denotes the notional principal amount of the agreement.

Floating-rate payments are based on an actual/360-day count, meaning that interest payments are calculated using the actual number of days elapsed since the previous payment date, based on a 360-day year. Let d_t denote the number of days since the last settlement date. Then, the floating-rate payment is determined by the formula:

$$(N)(LIBOR)(d_t/360).$$

Example

Suppose a dealer quotes an All-In-Cost for a generic swap at 10 percent against six-month LIBOR flat. If the notional principal amount of the swap is \$1 million, then the semiannual fixed payment would be

$$\$50,000 = (\$1,000,000) (0.10) (180/360).$$

Suppose that the six-month period from the effective date of the swap to the first payment date (sometimes also termed a settlement date) comprises 181 days and that the corresponding LIBOR was 8 percent on the swap's effective date. Then, the first floating-rate payment would be

$$\$40,222.22 = (\$1,000,000) (0.08) (181/360).$$

Often a swap agreement will call for only the net amount of the promised payments to be exchanged. In this example, the fixed-rate payer would pay the floating-rate payer a net amount of

$$\$9,777.78 = \$50,000.00 - \$40,222.22.$$

A payment frequency "mismatch" occurs when the floating-rate payment frequency does not match the scheduled frequency of the fixed-rate payment. Mismatches typically arise in the case of swaps that base floating-rate payments on maturities shorter than the six-month payment frequency common for fixed-rate payments.

Day-count Conventions: A wide variety of day-count conventions are used in the swap market. Fixed payments can be quoted either on an actual/365 (bond equivalent) basis or on an actual/360 basis. Floating-rate payments indexed to private-sector interest rates typically follow an actual/360 day-count convention commonly used in the money market. Floating-rate payments tied to Treasury bill rates are calculated on an actual/365 basis.

15.2.6 Non-Generic Swaps: An interest rate swap that specifies an exchange of payments based on the difference between two different variable rates is known as a "basis swap." For example, a basis swap might specify the exchange of payments based on the difference between LIBOR and the prime rate. Other interest rate swaps include the forward swap, in which the effective date of the swap is deferred; the swaption, which is an option on an interest rate swap; and puttable and callable swaps, in which one party has the right to cancel the swap at certain times. This list is far from exhaustive—many other types of interest rate swaps are currently traded, and the number grows with each year.

15.2.7 Swap Valuation: Interest rate swaps can be viewed as implicit mutual lending arrangements. A party to an interest rate swap implicitly holds a long position in one type of interest-bearing security and a short position in another. Swap valuation techniques utilize this fact to reduce the problem of pricing an interest rate swap to a straightforward problem of pricing two underlying hypothetical securities having a redemption or face value equal to the notional principal amount of the swap.

15.2.8 Non-Par Swaps: In most cases swaps are priced so that the initial value of the agreement is zero to both counterparties; that is, so that the value of both hypothetical component securities is just equal to the notional principal amount of the swap. Occasionally, however, a swap may be priced such that one party owes money to the other at initial settlement, resulting in a "non par" swap. Non par swaps are used to offset existing positions in swaps entered into in previous periods where interest rates have changed since the original swap was negotiated, or in cases where a given cash flow needs to be matched exactly. Valuation methods for non-par swaps are somewhat more involved than the simple case discussed above.

15.2.9 The Effect of Changes in Market Interest Rates on Swap Values: A change in market interest rates affects the value of a fixed/floating swap in much the same way that it affects the value of a corporate bond with a comparable maturity. To see why, note that a change in market interest rates will have no effect on the value of the hypothetical variable-rate note implicit in a fixed/floating swap on interest rate reset dates. Therefore, on reset dates a change in market interest rates will affect the value of the swap only through its effect on the value of the hypothetical fixed-rate bond. Since an increase in interest rates lowers the value of the bond, it increases the value of the swap position for a fixed-rate payer to the same degree it would increase the value of a short position in a fixed-rate bond.

Between interest rate reset dates the amount of the next payment due on the variable-rate note is predetermined. Thus, a change in market interest rates affects the values of both the hypothetical variable-rate note and the hypothetical fixed-rate bond. The change in the value of the variable-rate note partially offsets the change in the value of the fixed-rate note in this case. As a general rule the price behavior of a fixed/floating interest rate swap will approximate the price behavior of a fixed-rate note with a maturity equal to the term of the swap less the maturity of the variable interest rate. For example, a two-year generic swap indexed to six-month LIBOR will approximate the behavior of a fixed-rate bond with a term to maturity of between 18 and 24 months, depending on the amount of time since the last interest rate reset date.

The value of a fixed/floating swap generally changes over time when the term structure of interest rates is upward-sloping. Only when the term structure is flat and market interest rates remain unchanged will the value of an interest rate swap remain unchanged over the life of the agreement.

Illustration 4

Explain the concept of interest rate swap by giving appropriate examples.

5.72 Strategic Financial Management

Solution

Lockwood Company has a high credit rating. It can borrow at a fixed rate of 10% or at a variable interest rate of LIBOR + 0.3%. It would like to borrow at a variable rate. Thomas Company has a lower credit rating. It can borrow at a fixed rate of 11% or at a variable rate of LIBOR + 0.5%. It would like to borrow at a fixed rate. Using the principle of comparative advantage, both parties could benefit from a swap arrangement, whereby.

- (i) Lockwood Company borrows at a fixed rate of 10%
- (ii) Thomas Company borrows at a variable rate of LIBOR+ 0.5%
- (iii) The parties agree a rate for swapping their interest commitments, with perhaps:

Thomas Company paying a fixed rate of 10.1% to Lockwood Company.

The outcome would be

Lockwood Company

Borrows at	10%
Receives from Thomas Company	(10.1%)
Pays to Thomas Company	<u>LIBOR</u>
Net interest cost	<u>LIBOR – 0.1%</u> (a saving of 0.4%)

Thomas Company

Borrows at	LIBOR + 0.5%
Receives from Lockwood Company (LIBOR)	
Pays to Lockwood Company	<u>10.1%</u>
Net interest cost	<u>10.6%</u> (a saving of 0.4%)

In this example, both companies benefit from lower costs.

15.3 Swaptions: An interest rate swaption is simply an option on an interest rate swap. It gives the holder the right but not the obligation to enter into an interest rate swap at a specific date in the future, at a particular fixed rate and for a specified term. For an up-front fee (premium), the customer selects the strike rate (the level at which it enters the interest rate swap agreement), the length of the option period, the floating rate index (Prime, LIBOR, C.P.), and tenor. The term swaption is typically referred to options on interest rate swaps.

The buyer and seller of the swaption agree on the strike rate, length of the option period (which usually ends on the starting date of the swap if swaption is exercised), the term of the swap, notional amount, amortization, and frequency of settlement.

Swaptions are designed to give the holder the benefit of the agreed upon strike rate if the market rates are higher, with the flexibility to enter into the current market swap rate if they are lower. Like any other option, if the swaption is not exercised by maturity it expires worthless

There are two types of swaption contracts:-

- A **fixed rate payer swaption** gives the owner of the swaption the right but not the obligation to enter into a swap where they pay the fixed leg and receive the floating leg.
- A **fixed rate receiver swaption** gives the owner of the swaption the right but not the obligation to enter into a swap in which they will receive the fixed leg, and pay the floating leg.

Swaptions fall into three main categories, depending upon the exercise rights of the buyer:

- (a) European Swaptions give the buyer the right to exercise only on the maturity date of the option.
- (b) American Swaptions, on the other hand, give the buyer the right to exercise at any time during the option period.
- (c) Bermudan Swaptions give the buyer the right to exercise on specific dates during the option period.

15.3.1 Principal Features of Swaptions: Following are main principles of Swaptions.

- (a) A swaption is effectively an option on a forward-start IRS, where exact terms such as the fixed rate of interest, the floating reference interest rate and the tenor of the IRS are established upon conclusion of the swaption contract. The underlying instrument on which a swaption is based is a forward start IRS.
- (b) A 3-month into 5-year swaption would therefore be seen as an option to enter into a 5-year IRS, 3 months from now. It is also important for the calculation of the premium, whether the swaption is a 'payer swaption' or a 'receiver swaption' type.
- (c) The 'option period' refers to the time which elapses between the transaction date and the expiry date. The fixed rate of interest on the swaption is called the strike rate.
- (d) The swaption premium is expressed as basis points. These basis points are applied to the nominal principal of the forward-start IRS. A borrower would amortise the premium over the life of the option if the swaption is entered into for the reasons of hedging an underlying borrowing.
- (e) Swaptions can be cash-settled; therefore at expiry they are marked to market off the applicable forward curve at that time and the difference is settled in cash. If forward swap rates fall, a fixed rate receiver swaption will increase in value in marking such a swaption to market, and a fixed-rate payer swaption will decrease in value. In the event of the swaption being cash-settled, the counterparties end up without actually transacting an IRS with each other

15.3.2 Example of a Swaption: Suppose X Ltd. is expected to have \$1,000,000 in US\$ available to invest for a 3-year period. X wants to protect itself against falling interest rates and guarantee a minimum return of 5%. At the same time, it wants to be able to take

5.74 Strategic Financial Management

advantage of any possible rise in interest rates. Company buys a Swaption from a Bank at a rate of 5% for a 3-month period.

Now let us see how the Swaption would work in following two situations:

- (a) In 3 months' time the Interest-Rate Swap rate for 3 years is at 4.5%. X uses Swaption and asks bank to provide itself with an Interest-Rate Swap for this period at the agreed rate of 5%. Thus 5% return for the time left is protected. (Alternatively X could ask Bank to pay a compensation equal to a margin of 0.5% for the same period.)
- (b) In 3 months' time the Interest-Rate Swap rate for 3 years is at 5.4%. X do not want to use your Swaption and instead deposit its funds at the market rate of 5.4%. In these circumstances the Swaption protected X against falling interest rates and also allowed it to take advantage of the rise in rates.

15.3.3 Pricing of Swaptions: The pricing methodology depends upon setting up a model of probability distribution of the forward zero-coupon curve which goes a Market process.

The market standard tool for pricing swaptions is to simulate the route taken by the modified Black model. This is because of its ease of use and market acceptance. However, the modified Black formula has been subject to extensive criticism from various sources over the years. Newer models, such as the Ho-Lee, Heath-Jarrow-Merton and Hull-White models, are called arbitrage-free models and are designed to avoid arbitrage possibilities due to changes in the yield curve. Some of the newer models also make the volatility itself a stochastic term.

15.3.4 Uses of Swaptions: Following are main uses of Swaptions:

- (a) Swaptions can be applied in a variety of ways for both active traders as well as for corporate treasurers. Swap traders can use them for speculation purposes or to hedge a portion of their swap books. The attraction of swaptions for corporate treasurers is that the forward element in all swaptions provides the attractions of the forward-start swap, and to the owner of the put or call, also the flexibility to exercise or not, as may be considered appropriate. It is therefore a valuable tool when a borrower has decided to do a swap but is not sure of the timing.
- (b) Swaptions have become useful tools for hedging embedded optionality which is common to the natural course of many businesses. Certainly, embedded optionality is present whenever products are sold on a 'sale-and-leaseback' basis, where the counterparty to a lease contract has the right to either to extend a lease for a five-year period or terminate a lease after an initial five-year period. The leasing company may be exposed where the lease income is less than the cost of funding the asset which is being leased. By entering into a 5-year swaption, the leasing company is able to protect itself against the lessee exercising their option to extend the lease. If the lessee decides not to extend, the swap will remain unexercised. A huge advantage of the swaption is that the leasing company could potentially still benefit from entering into a swaption originally if the forward swap rates have moved in his favour during the option period. In any event, the leasing

company has immunised itself against loss and bought itself reasonable flexibility, whilst only paying the premium at the start.

Swaptions are useful to borrowers targeting an acceptable borrowing rate. By paying an upfront premium, a holder of a payer's swaption can guarantee to pay a maximum fixed rate on a swap, thereby hedging his floating-rate borrowings. The borrower is therefore allowed to remain in low floating-rate funds while at the same time being assured of protection should rates increase expectedly (i.e. when the yield curve is positive) or unexpectedly (i.e. when the yield curve is flat or negative).

Swaptions are also useful to those businesses tendering for contracts. Businesses need to settle the question whether to commit to borrowings in the future in their own currency in terms of a tender on a future project. A business would certainly find it useful to bid on a project with full knowledge of the borrowing rate should the contract be won.

Swaptions also provide protection on callable/puttable bond issues. Also, the perception of the value of the embedded call inherent in a callable bond issue often differs between investors and professional option traders, therefore allowing arbitrage. A callable bond issue effectively endows the borrower with an embedded receiver's swaption, which he can sell to a bank and use the premium to reduce his cost of funds. The more innovative borrowers can use this arbitrage opportunity to their advantage in order to bring down their funding cost.

15.4 Interest Rate Caps: The buyer of an interest rate cap pays the seller a premium in return for the right to receive the difference in the interest cost on some notional principal amount any time a specified index of market interest rates rises above a stipulated "cap rate." The buyer bears no obligation or liability if interest rates fall below the cap rate, however. Thus, a cap resembles an option in that it represents a right rather than an obligation to the buyer.

Caps evolved from interest rate guarantees that fixed a maximum level of interest payable on floating-rate loans. The advent of trading in over-the-counter interest rate caps dates back to 1985, when banks began to strip such guarantees from floating-rate notes to sell to the market. The leveraged buyout boom of the 1980s spurred the evolution of the market for interest rate caps. Firms engaged in leveraged buyouts typically took on large quantities of short-term debt, which made them vulnerable to financial distress in the event of a rise in interest rates. As a result, lenders began requiring such borrowers to buy interest-rate caps to reduce the risk of financial distress. More recently, trading activity in interest rate caps has declined as the number of new leveraged buyouts has fallen. An interest rate cap is characterized by:

- a notional principal amount upon which interest payments are based;
- an interest rate index, typically some specified maturity of LIBOR;
- a cap rate, which is equivalent to a strike or exercise price on an option; and
- the period of the agreement, including payment dates and interest rate reset dates.

5.76 Strategic Financial Management

Payment schedules for interest rate caps follow conventions in the interest rate swap market. Payment amounts are determined by the value of the index rate on a series of interest rate reset dates. Intervals between interest rate reset dates and scheduled payment dates typically coincide with the term of the interest rate index. Thus, interest rate reset dates for a cap indexed to six-month LIBOR would occur every six months with payments due six months later. Cap buyers typically schedule interest rate reset and payment intervals to coincide with interest payments on outstanding variable-rate debt. Interest rate caps cover periods ranging from one to ten years with interest rate reset and payment dates most commonly set either three or six months apart.

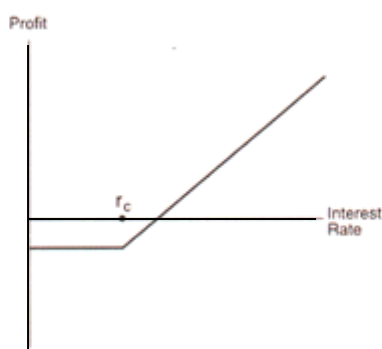
If the specified market index is above the cap rate, the seller pays the buyer the difference in interest cost on the next payment date. The amount of the payment is determined by the formula

$$(N) \max(0, r - r_c)(d_t / 360),$$

where N is the notional principal amount of the agreement, r_c is the cap rate (expressed as a decimal), and d_t is the number of days from the interest rate reset date to the payment date. Interest rates quoted in cap agreements follow money market day-count conventions, so that payment calculations assume a 360-day year.

Figure 3 depicts the payoff to the buyer of a one-period interest rate cap. If the index rate is above the cap rate, the buyer receives a payment of $(N)(r - r_c)(d_t / 360)$, which is equivalent to the payoff from buying an FRA.¹ Otherwise, the buyer receives no payment and loses the premium paid for the cap. Thus, a cap effectively gives its buyer the right, but not the obligation, to buy an FRA with a forward rate equal to the cap rate. Such an agreement is known as a call option. A one-period cap can be viewed as a European call option on an FRA with a strike price equal to the cap rate r_c .² More generally, multi-period Caps, which specify a series of future interest rate reset and payment dates, can be viewed as a bundle of European call options on a sequence of FRAs.

Figure 3- The Payoff to Buying a One-Period Interest Rate Cap



¹ One difference between the payoff to an FRA and the payoff to an in-the-money cap is that an FRA pays the present value of the change in interest payable on the notional principal at settlement (which corresponds to the reset date of a cap), while payments on caps are deferred. The value of the payment has the same present value in both cases, however, so

that the comparison between the payoff to a cap and a call option on an FRA remains accurate.

² A European option can be exercised only on its expiration date. Similarly, a cap buyer can only "exercise" his option if the index rate is above the cap rate on the interest rate reset date, so that the interest rate reset date corresponds to the expiration date on a European-style option.

Example

Consider a one-year interest rate cap that specifies a notional principal amount of \$1 million and a six-month LIBOR cap rate of 5 percent. Assume the agreement covers a period starting January 15 through the following January 15 with the interest rate to be reset on July 15. The first period of a cap agreement typically is excluded from the agreement, so the cap buyer in this example will be entitled to a payment only if the six-month LIBOR exceeds 5 percent on the July 15 interest rate reset date. Suppose that six-month LIBOR is 5.5 percent on July 15. Then, on the following January 15 (184 days after the July 15 reset date) the seller will owe the buyer

$$\$2,555.56 = (\$1,000,000)(0.055 - 0.050)(184/360).$$

Comparison of Caps and Futures Options: A one-period cap can be compared to a put option on a Eurodollar futures contract. To see why, note that the payoff at expiration to a put option on Eurodollar futures is

$$(N) \max(0, K - F)(90/360),$$

Where,

N is the notional principal amount of the agreement (\$1 million for a Eurodollar futures option),

K is the strike price, and

F is the price of the underlying futures contract.

The price index used for Eurodollar futures can be written as $F = 100 - r$, where r is the three-month LIBOR implied by the futures price. Now, write $K = 100 - r_k$, where r_k is the futures interest rate implied by the strike price K . Then, the payoff at expiration to a Eurodollar futures option can be expressed as

$$(N) \max[0, 100 - r_k - (100 - r)](90/360) = (N) \max(0, r - r_k)(90/360).$$

Where,

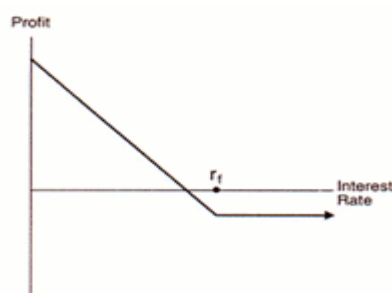
N is the notional principal amount of the agreement,

r_c is the cap rate, r_f is the floor rate, and

d_t is the term of the index in days.

15.5 Interest Rate Floors: It is an OTC instrument that protects the buyer of the floor from losses arising from a decrease in interest rates. The seller of the floor compensates the buyer with a pay off when the interest rate falls below the strike rate of the floor.

Figure 4- The Payoff to Buying a One-Period Interest Rate Floor



The payment received by the buyer of an interest rate floor is determined by the formula

$$(N) \max(0, r_f - r)(d_t/360),$$

Where,

N is the notional principal amount of the agreement,

r_f is the floor rate or strike price, and

d_t is the number of days from the last interest rate reset date to the payment date.

Figure 4 depicts the payoff to a one-period floor as a function of the value of the underlying index rate. If the index rate is below the floor rate on the interest rate reset date the buyer receives a payment of $(N)(r_f - r)(d_t/360)$, which is equivalent to the payoff from selling an FRA at a forward rate of r_f . On the other hand, if the index rate is above the floor rate the buyer receives no payment and loses the premium paid to the seller. Thus, a floor effectively gives the buyer the right, but not the obligation, to sell an FRA, which makes it equivalent to a European put option on an FRA. More generally, a multi-period floor can be viewed as a bundle of European-style put options on a sequence of FRAs maturing on a succession of future maturity dates.

Comparison of Floors and Futures Options: Purchasing a one-period interest rate floor yields a payoff closely resembling that of a long Eurodollar futures call option. The payoff to a call option on a Eurodollar futures contract is $(N) \max(0, F - K)(90/360)$.

Where,

$F = 100 - r$ is the index price of the underlying futures contract, and

K is the strike price.

As before, write $K = 100 - r_k$. Then, the payoff to a Eurodollar futures call option can be expressed in terms of the underlying interest rate as

$$(N) \max(0, r_k - r)(90/360),$$

which is the same as the payoff to a one-period interest rate floor indexed to 90-day LIBOR with a floor rate equal to r_k . The one noteworthy difference between the two instruments is that a Eurodollar futures option can be exercised at any time, while a floor resembles a European

option that can only be exercised on its expiration date. Like caps, interest rate floors settle in arrears, whereas a futures option settles on its expiration date.

15.6 Interest Rate Collars: The buyer of an interest rate collar purchases an interest rate cap while selling a floor indexed to the same interest rate. Borrowers with variable-rate loans buy collars to limit effective borrowing rates to a range of interest rates between some maximum, determined by the cap rate, and a minimum, which is fixed by the floor strike price; hence, the term "collar." Although buying a collar limits a borrower's ability to benefit from a significant decline in market interest rates, it has the advantage of being less expensive than buying a cap alone because the borrower earns premium income from the sale of the floor that offsets the cost of the cap. A zero-cost collar results when the premium earned by selling a floor exactly offsets the cap premium.

The amount of the payment due to or owed by a buyer of an interest rate collar is determined by the expression

$$(N) [\max(0, r - r_c) - \max(0, r_f - r)](d_t / 360),$$

Where,

- N is the notional principal amount of the agreement,
- r_c is the cap rate, r_f is the floor rate, and
- d_t is the term of the index in days.

Figure 5 illustrates the payoff to buying a one-period zero-cost interest rate collar. If the index interest rate r is less than the floor rate r_f on the interest rate reset date, the floor is in-the-money and the collar buyer (who has sold a floor) must pay the collar counterparty an amount equal to $(N)(r_f - r)(d_t/360)$. When r is greater than r_f but less than the cap rate r_c , both the floor and the cap are out-of-the-money and no payments are exchanged. Finally, when the index is above the cap rate the cap is in-the-money and the buyer receives $(N)(r - r_c)(d_t/360)$.

Figure 5- The Payoff to Buying a One-Period, Zero-Cost Collar

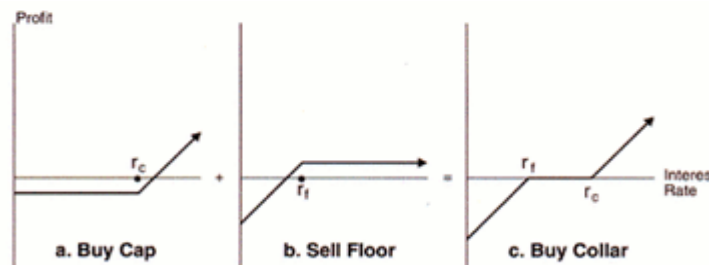
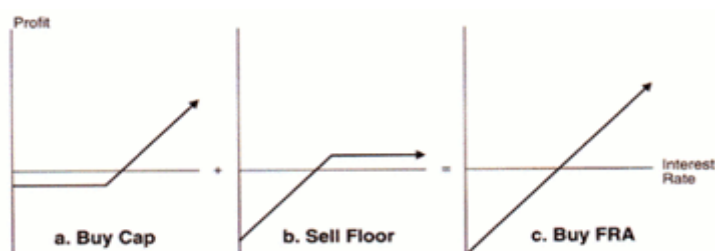


Figure 6 illustrates a special case of a zero-cost collar that results from the simultaneous purchase of a one-period cap and sale of a one-period floor when the cap and floor rates are equal. In this case the combined transaction replicates the payoff of an FRA with a forward interest rate equal to the cap/floor rate. This result is a consequence of a property of option prices known as put-call parity.

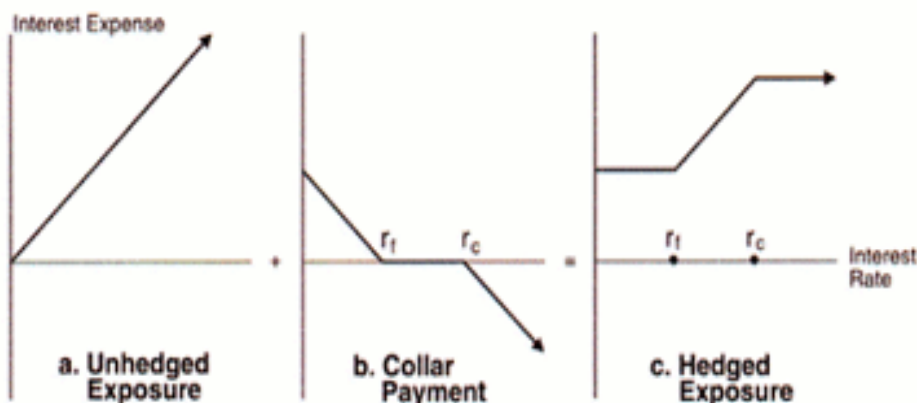
More generally, the purchase of a cap and sale of a floor with the same notional principle, index rate, strike price, and reset dates produces the same payout stream as an interest rate swap with an All-In-Cost equal to the cap or floor rate. Since caps and floors can be viewed as a sequence of European call and put options on FRAs, buying a cap and selling a floor with the same strike price and interest rate reset and payment dates effectively creates a sequence of FRAs, all with the same forward rate. But note that an interest rate swap can be viewed as a sequence of FRAs, each with a forward rate equal to the All-In-Cost of the swap. Therefore, put-call parity implies that buying a cap and selling a floor with the same contract specifications results in the same payment stream that would be obtained by buying an interest rate swap.

Figure 6- Put-Call Parity



15.7 Hedging Uses of Interest Rate Collars: Figure 7 illustrates the effect that buying a one-period, zero-cost collar has on the exposure to changes in market interest rates faced by a firm with outstanding variable-rate debt. The first panel depicts the firm's inherent or unhedged interest exposure, while the second panel illustrates the effect that buying a collar has on interest expense. Finally, the third panel combines the borrower's inherent exposure with the payoff to buying a collar to display the effect of a change in market interest rates on a hedged borrower's interest expense. Note that changes in market interest rates can only affect the hedged borrower's interest expense when the index rate varies between the floor and cap rates. Outside this range, the borrower's interest expense is completely hedged.

Figure 7- The Effect of Buying an Interest Rate Collar on Interest Expense



Thus, it can be summarized that in an interest rate option, the underlying asset is related to the change in an interest rate. In an interest rate cap, for example, the seller agrees to compensate the buyer for the amount by which an underlying short-term rate exceeds a specified rate on a series of dates during the life of the contract. In an interest rate *floor*, the seller agrees to compensate the buyer for a rate falling below the specified rate during the contract period. A *collar* is a combination of a long (short) cap and short (long) floor, struck at different rates. Finally, a *swap option (swaption)* gives the holder the right—but not the obligation—to enter an interest rate swap at an agreed upon fixed rate until or at some future date.

15.8 Caps and Floors Versus Swaptions: For caps/floors, the relevant stochastic variable is the implied forward rate for each time bucket. Comparatively, the underlying stochastic variable for swaptions would be the forward-starting swap. It is also important to note that a swaption will actually only has one date of exercise compared to a cap (which is essentially a series of separate call options on forward rates). Although the cash flow dates will be similar, each caplet in a cap should be treated independently. Once a swaption is exercised, all the cash flows on the underlying IRS of the swaption will occur. There is consequently quite a big difference between a 2-year cap on 3-month instrument (a total of 7 options) and a 3-month swaption on an 18-month forward-start IRS (only a single option). This difference is reflected in the fact that swaptions attract a lower premium.

Where swaptions are used to hedge a borrowing, it would appear at first glance that the cost of the premium of swaptions would cancel any benefit. This would be the case if the hedge were priced entirely off the forward curve, as is the case when caps are used. The volatility element in the cap premium is determined by taking into account the consideration of each time bucket. As pointed out, a swaption is however an option on a forward start IRS. The volatility curve is therefore drawn around the swap and not the forward curve. The swap curve will always be below the forward curve as long as the two curves are positive. This relationship results from the fact that the swap rate is the one fixed rate that causes the sum of the net present values of the fixed cash flows to equal the sum of the net present values of the floating flows.

Another difference between the instruments is the fact that once a swaption is exercised, the holder has entered into a swap. This swap will have been entered into at a favourable rate, but the holder can still lose money if the rates move against him. When a cap is exercised, the holder can never lose money.

15.9 The Indian Scenario: The OTC derivatives markets have witnessed rather sharp growth over the last few years, which have accompanied the modernization of commercial and investment banking and globalisation of financial activities. The recent developments in information technology have contributed to a great extent to these developments. While both exchange-traded and OTC derivative contracts offer many benefits, the former have rigid

5.82 Strategic Financial Management

structures compared to the latter. It has been widely discussed that the highly leveraged institutions and their OTC derivative positions can lead to turbulence in financial markets.

The OTC derivatives markets have the following features compared to exchange-traded derivatives.

The management of counter-party (credit) risk is decentralized and located within individual institutions. There are no formal centralized limits on individual positions, leverage, or margining. There are no formal rules for risk and burden-sharing. There are no formal rules or mechanisms for ensuring market stability and integrity, and for safeguarding the collective interests of market participants, and the OTC contracts are generally not regulated by a regulatory authority and the exchange's self-regulatory organization, although they are affected indirectly by national legal systems, banking supervision and market surveillance.

6

Security Analysis

Learning Objective

After going through the chapter student shall be able to understand:

Fundamental Analysis

- **Dividend Growth Model and the PE Multiple**
- **Economic Analysis**
 - (1) Factors Affecting Economic Analysis
 - (2) Techniques Used in Economic Analysis
- **Industry Analysis**
 - (1) Factors Affecting Industry Analysis
 - (2) Techniques Used in Industry Analysis
- **Company Analysis**

Technical Analysis

- **General Principles and Methods of Technical Analysis**
 - (1) The Dow Theory
 - (2) Market Indicators
 - (3) Support and Resistance Levels
 - (4) Interpreting Price Patterns
 - (5) Decision using Data Analysis
- **Evaluation of Technical Analysis**

Bond Valuation

- (1) Some Basics of a Bond
- (2) Bond Valuation Model
- (3) Bond Value Theorems
- (4) Yield to Maturity

6.2 Strategic Financial Management

- (5) Bond Values with Semi-Annual Interest
- (6) Price-Yield Relationship
- (7) Relationship between Bond Price and Time
- (8) The Yield Curve
- (9) Duration of Bond

1. Introduction

Investment decision depends on securities to be bought, held or sold. Buying security is based on highest return per unit of risk or lowest risk per unit of return. Selling security does not depend on any such requirement. A security considered for buying today may not be attractive tomorrow due to management policy changes in the company or economic policy changes adopted by the government. The reverse is also true. Therefore, analysis of the security on a continuous basis is a must.

Security Analysis involves a systematic analysis of the risk return profiles of various securities which is to help a rational investor to estimate a value for a company from all the price sensitive information/data so that he can make purchases when the market under-prices some of them and thereby earn a reasonable rate of return.

Two approaches viz. fundamental analysis and technical analysis are in vogue for carrying out Security Analysis. In fundamental analysis, factors affecting risk-return characteristics of securities are looked into while in technical analysis, demand/ supply position of the securities along with prevalent share price trends are examined.

2. Fundamental Analysis

Fundamental analysis is based on the assumption that the share prices depend upon the future dividends expected by the shareholders. The present value of the future dividends can be calculated by discounting the cash flows at an appropriate discount rate and is known as the '*intrinsic value of the share*'. The intrinsic value of a share, according to a fundamental analyst, depicts the true value of a share. A share that is priced below the intrinsic value must be bought, while a share quoting above the intrinsic value must be sold.

Thus, it can be said that the price the shareholders are prepared to pay for a share is nothing but the present value of the dividends they expect to receive on the share and this is the price at which they expect to sell it in the future.

As a first step, to arrive at a compact expression, let us make a simple assumption, that the company is expected to pay a uniform dividend of ₹ D per share every year, i.e.,

$$D(1) = D(2) = D(3) = \dots = D, \quad (1)$$

The Eq., would then become:

$$P(0) = \frac{D}{(1+k)} + \frac{D}{(1+k)^2} + \frac{D}{(1+k)^3} + \dots + \dots \quad (2)$$

But it is unrealistic to assume that dividends remain constant over time. In case of most shares, the dividends per share (DPS) grow because of the growth in the earnings of the firm. Most companies, as they identify new investment opportunities for growth, tend to increase their DPS over a period of time.

Let us assume that on an average the DPS of the company grows at the compounded rate of g per annum, so that dividend $D(1)$ at the end of the first period grows to $D(1)(1+g)$, $D(1)(1+g)^2$, etc, at the end of second period, third period, etc. respectively. So we must have:

$$P(0) = \frac{D(1)}{(1+k)} + \frac{D(1)(1+g)}{(1+k)^2} + \frac{D(1)(1+g)^2}{(1+k)^3} + \dots + \dots (3)$$

which is a perpetual geometric series.

If growth rate in dividends, g , is less than the desired rate of return on share, k , we must have:

$$P(0) = \frac{D(1)}{(k-g)} \tag{4}$$

or

$$P(0) = \frac{D(0)(1+g)}{(k-g)} \tag{5}$$

Since $D(1)$ may be approximated as $D(0)(1+g)$, $D(0)$ being the DPS in the current period (0).

When growth rate in dividends, g , is equal to or greater than the desired rate of return on share, k , the above model is not valid, since the geometric series leads to an infinite price. The condition that g be less than k is not very restrictive, since the long-term growth in dividends is unlikely to exceed the rate of return expected by the market on the share.

The above result [Eq.(4)] is also known as Gordon's dividend growth model for stock valuation, named after the model's originator, Myron J. Gordon. This is one of the most well known models in the genre of fundamental analysis.

In equation (5), if "g" is set at zero, we get back equation (2).

2.1 Dividend Growth Model and the PE Multiple: Financial analysts tend to relate price to earnings via the P/E multiples (the ratio between the market price and earnings per share).

If a company is assumed to pay out a fraction b of its earnings as dividends on an average (i.e. the Dividend Payout Ratio = b), $D(1)$ may be expressed as $b E(1)$, where $E(1)$ is the earning per share (EPS) of the company at the end of the first period. Equation (4) then becomes:

$$P(0) = \frac{bE(1)}{(k-g)} \tag{6}$$

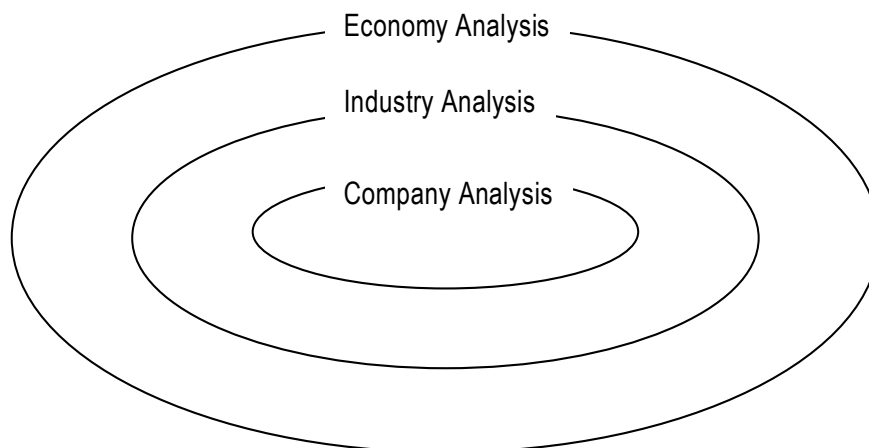
or

6.4 Strategic Financial Management

$$P(0) = \frac{bE(0)(1+g)}{(k-g)} \quad (7)$$

The fundamental analysts use the above models or some of their variations, for estimating the fundamental or intrinsic price or the fundamental price-earnings multiple of a security. Towards this end, they devote considerable effort in assessing the impact of various kinds of information on a company's future profitability and the expected return of the shareholders. If the prevailing price or the P/E multiple of a security is higher than the estimated fundamental value (i.e. if the security appears to be overpriced), they recommend a selling stance with respect to that security, since once the information becomes common knowledge, the price of the security may be expected to fall. On the other hand, if the security is under-priced in the market, the prevailing price (or the P/E multiple) of the security being lower than the estimated fundamental value, they recommend buying the security, counting upon a price rise.

Because of these inherent complex interrelationships in the production processes, the fortunes of each industry are closely tied to those of other industries and to the performance of the economy as a whole. Within an industry, the prospects of a specific company depend not only on the prospects of the industry to which it belongs, but also on its operating and competitive position within that industry. The key variables that an investor must monitor in order to carry out his fundamental analysis are economy wide factors, industry wide factors and company specific factors. In other words, fundamental analysis encompasses economic, industrial and company analyses. They are depicted by three concentric circles and constitute the different stages in an investment decision making process.



2.2 Economic Analysis : Macro- economic factors e. g. historical performance of the economy in the past/ present and expectations in future, growth of different sectors of the economy in future with signs of stagnation/degradation at present to be assessed while analyzing the overall economy. Trends in peoples' income and expenditure reflect the growth of a particular industry/company in future. Consumption affects corporate profits, dividends and share prices in the market.

2.2.1 Factors Affecting Economic Analysis: Some of the economy wide factors are discussed as under:

(a) Growth Rates of National Income and Related Measures: For most purposes, what is important is the difference between the nominal growth rate quoted by GDP and the 'real' growth after taking inflation into account. The estimated growth rate of the economy would be a pointer to the prospects for the industrial sector, and therefore to the returns investors can expect from investment in shares.

(b) Growth Rates of Industrial Sector: This can be further broken down into growth rates of various industries or groups of industries if required. The growth rates in various industries are estimated based on the estimated demand for its products.

(c) Inflation: Inflation is measured in terms of either wholesale prices (the Wholesale Price Index or WPI) or retail prices (Consumer Price Index or CPI). The demand in some industries, particularly the consumer products industries, is significantly influenced by the inflation rate. Therefore, firms in these industries make continuous assessment about inflation rates likely to prevail in the near future so as to fine-tune their pricing, distribution and promotion policies to the anticipated impact of inflation on demand for their products.

(d) Monsoon: Because of the strong forward and backward linkages, monsoon is of great concern to investors in the stock market too.

2.2.2 Techniques Used in Economic Analysis: Economic analysis is used to forecast national income with its various components that have a bearing on the concerned industry and the company in particular. Gross national product (GNP) is used to measure national income as it reflects the growth rate in economic activities and has been regarded as a forecasting tool for analyzing the overall economy along with its various components during a particular period.

Some of the techniques used for economic analysis are:

(a) Anticipatory Surveys: They help investors to form an opinion about the future state of the economy. It incorporates expert opinion on construction activities, expenditure on plant and machinery, levels of inventory – all having a definite bearing on economic activities. Also future spending habits of consumers are taken into account.

In spite of valuable inputs available through this method, it has certain drawbacks:

- (i) Survey results do not guarantee that intentions surveyed would materialize.
- (ii) They are not regarded as forecasts per se, as there can be a consensus approach by the investor for exercising his opinion.

Continuous monitoring of this practice is called for to make this technique popular.

(b) Barometer/Indicator Approach: Various indicators are used to find out how the economy shall perform in the future. The indicators have been classified as under:

- (i) *Leading Indicators:* They lead the economic activity in terms of their outcome. They relate to the time series data of the variables that reach high/low points in advance of economic activity.

6.6 Strategic Financial Management

- (ii) *Roughly Coincidental Indicators*: They reach their peaks and troughs at approximately the same in the economy.
- (iii) *Lagging Indicators*: They are time series data of variables that lag behind in their consequences vis-a- vis the economy. They reach their turning points after the economy has reached its own already.

All these approaches suggest direction of change in the aggregate economic activity but nothing about its magnitude. The various measures obtained from such indicators may give conflicting signals about the future direction of the economy. To avoid this limitation, use of diffusion/composite index is suggested whereby combining several indicators into one index to measure the strength/weaknesses in the movement of a particular set of indicators. Computation of diffusion indices is no doubt difficult notwithstanding the fact it does not eliminate irregular movements.

Money supply in the economy also affects investment decisions. Rate of change in money supply in the economy affects GNP, corporate profits, interest rates and stock prices. Increase in money supply fuels inflation. As investment in stocks is considered as a hedge against inflation, stock prices go up during inflationary period.

(c) Economic Model Building Approach: In this approach, a precise and clear relationship between dependent and independent variables is determined. GNP model building or sectoral analysis is used in practice through the use of national accounting framework. The steps used are as follows:

- (i) Hypothesize total economic demand by measuring total income (GNP) based on political stability, rate of inflation, changes in economic levels.
- (ii) Forecasting the GNP by estimating levels of various components viz. consumption expenditure, gross private domestic investment, government purchases of goods/services, net exports.
- (iii) After forecasting individual components of GNP, add them up to obtain the forecasted GNP.
- (iv) Comparison is made of total GNP thus arrived at with that from an independent agency for the forecast of GNP and then the overall forecast is tested for consistency. This is carried out for ensuring that both the total forecast and the component wise forecast fit together in a reasonable manner.

2.3 Industry Analysis: When an economy grows, it is very unlikely that all industries in the economy would grow at the same rate. So it is necessary to examine industry specific factors, in addition to economy-wide factors.

First of all, an assessment has to be made regarding all the conditions and factors relating to demand of the particular product, cost structure of the industry and other economic and Government constraints on the same. Since the basic profitability of any company depends upon the economic prospects of the industry to which it belongs, an appraisal of the particular industry's prospects is essential.

2.3.1 Factors Affecting Industry Analysis: The following factors may particularly be kept in mind while assessing the factors relating to an industry.

(a) Product Life-Cycle: An industry usually exhibits high profitability in the initial and growth stages, medium but steady profitability in the maturity stage and a sharp decline in profitability in the last stage of growth.

(b) Demand Supply Gap: Excess supply reduces the profitability of the industry because of the decline in the unit price realization, while insufficient supply tends to improve the profitability because of higher unit price realization.

(c) Barriers to Entry: Any industry with high profitability would attract fresh investments. The potential entrants to the industry, however, face different types of barriers to entry. Some of these barriers are innate to the product and the technology of production, while other barriers are created by existing firms in the industry.

(d) Government Attitude: The attitude of the government towards an industry is a crucial determinant of its prospects.

(e) State of Competition in the Industry: Factors to be noted are- firms with leadership capability and the nature of competition amongst them in foreign and domestic market, type of products manufactured viz. homogeneous or highly differentiated, demand prospects through classification viz customer-wise/area-wise, changes in demand patterns in the long/immediate/short run, type of industry the firm is placed viz. growth, cyclical, defensive or decline.

(f) Cost Conditions and Profitability: The price of a share depends on its return, which in turn depends on profitability of the firm. Profitability depends on the state of competition in the industry, cost control measures adopted by its units and growth in demand for its products.

Factors to be considered are:

- (i) Cost allocation among various heads e.g. raw material, labors and overheads and their controllability. Overhead cost for some may be higher while for others labour may be so. Labour cost which depends on wage level and productivity needs close scrutiny.
- (ii) Product price.
- (iii) Production capacity in terms of installation, idle and operating.
- (iv) Level of capital expenditure required for maintenance / increase in productive efficiency.

Investors are required to make a through analysis of profitability. This is carried out by the study of certain ratios such as G.P. Ratio, Operating Profit Margin Ratio, R.O.E., Return on Total Capital etc.

(g) Technology and Research: They play a vital role in the growth and survival of a particular industry. Technology is subject to change very fast leading to obsolescence. Industries which update themselves have a competitive advantage over others in terms of quality, price etc.

Things to be probed in this regard are:

- (i) Nature and type of technology used.

6.8 Strategic Financial Management

- (ii) Expected changes in technology for new products leading to increase in sales.
- (iii) Relationship of capital expenditure and sales over time. More capital expenditure means increase in sales.
- (iv) Money spent in research and development. Whether this amount relates to redundancy or not?
- (v) Assessment of industry in terms of sales and profitability in short, immediate and long run.

2.3.2 Techniques Used in Industry Analysis: The techniques used for analyzing the industry wide factors are:

(a) Regression Analysis: Investor diagnoses the factors determining the demand for output of the industry through product demand analysis. Factors to be considered are GNP, disposable income, per capita consumption / income, price elasticity of demand. For identifying factors affecting demand, statistical techniques like regression analysis and correlation are used.

(b) Input – Output Analysis: It reflects the flow of goods and services through the economy, intermediate steps in production process as goods proceed from raw material stage through final consumption. This is carried out to detect changing patterns/trends indicating growth/decline of industries.

2.4 Company Analysis: Economic and industry framework provides the investor with proper background against which shares of a particular company are purchased. This requires careful examination of the company's quantitative and qualitative fundamentals.

(a) Net Worth and Book Value: Net Worth is sum of equity share capital and free reserves less intangible assets and any carry forward of losses. The total net worth divided by the number of shares is the much talked about book value of a share. Though the book value is often seen as an indication of the intrinsic worth of the share, this may not be so for two major reasons. First, the market price of the share reflects the future earnings potential of the firm which may have no relationship with the value of its assets. Second, the book value is based upon the historical costs of the assets of the firm and these may be gross underestimates of the cost of the replacement or resale values of these assets.

(b) Sources and Uses of Funds: The identification of sources and uses of funds is known as Funds Flow Analysis.

One of the major uses of funds flow analysis is to find out whether the firm has used short-term sources of funds to finance long-term investments. Such methods of financing increases the risk of liquidity crunch for the firm, as long-term investments, because of the gestation period involved may not generate enough surplus in time to meet the short-term liabilities incurred by the firm. Many a firm has come to grief because of this mismatch between the maturity periods of sources and uses of funds.

(c) Cross-Sectional and Time Series Analysis: One of the main purposes of examining financial statements is to compare two firms, compare a firm against some benchmark figures for its industry and to analyse the performance of a firm over time. The techniques that are

used to do such proper comparative analysis are: common-sized statement, and financial ratio analysis.

(d) Size and Ranking: A rough idea regarding the size and ranking of the company within the economy, in general, and the industry, in particular, would help the investment manager in assessing the risk associated with the company. In this regard the net capital employed, the net profits, the return on investment and the sales figures of the company under consideration may be compared with similar data of other companies in the same industry group. It may also be useful to assess the position of the company in terms of technical know-how, research and development activity and price leadership.

(e) Growth Record: The growth in sales, net income, net capital employed and earnings per share of the company in the past few years should be examined. The following three growth indicators may be particularly looked into: (a) Price earnings ratio, (b) Percentage growth rate of earnings per annum, and (c) Percentage growth rate of net block.

The price earnings ratio is an important indicator for the investment manager since it shows the number of times the earnings per share are covered by the market price of a share. Theoretically, this ratio should be the same for two companies with similar features. However, this is not so in practice due to many factors. Hence, by a comparison of this ratio pertaining to different companies the investment manager can have an idea about the image of the company and can determine whether the share is under-priced or over-priced.

Consider the following example:

		<i>Company A</i>	<i>Company B</i>
(a)	Market price of share of ₹ 100	150	250
(b)	Earnings per share	25	25
(c)	Price earnings ratio [(a) ÷ (b)]	6	10

It is obvious that the purchaser of company A's shares pays 6 times its annual earnings while the purchaser of company B's shares pays 10 times. If other factors (intrinsic value of share, growth potential, etc.) are quite similar, it is obvious that the shares of company A are preferable. In practice, however, the other factors are never similar in the case of two companies. The investment manager must try to ascertain why the EPS in company B is comparatively low – may be some factors are not apparent. EPS calculation cannot be the sole basis of deciding about an investment. Yet it is one of the most important factors on the basis of which the investment manager takes a decision to purchase the shares. This is because it relates the market price of the shares and the earnings per share.

The percentage growth rate of net blocks shows how the company has been developing its capacity levels. Obviously, a dynamic company will keep on expanding its capacities and diversify its business. This will enable it to enter new and profitable lines and avoid stagnation in its growth.

In this context, an evaluation of future growth prospects of the company should be carefully made. This requires an analysis of existing capacities and their utilisation, proposed expansion and diversification plans and the nature of the company's technology. The existing

6.10 Strategic Financial Management

capacity utilisation levels can be known from the quantitative information given in the published profit and loss accounts of the company. The plans of the company, in terms of expansion or diversification, can be known from the Directors' Reports, the Chairman's statements and from the future capital commitments as shown by way of notes in the balance sheets. The nature of technology of a company should be seen with reference to technological developments in the concerned fields, the possibility of its product being superseded or the possibility of emergence of a more effective method of manufacturing.

Growth is the single most important factor in company analysis for the purpose of investment management. A company may have a good record of profits and performance in the past; but if it does not have growth potential, its shares cannot be rated high from the investment point of view.

(f) Financial Analysis: An analysis of its financial statements for the past few years would help the investment manager in understanding the financial solvency and liquidity, the efficiency with which the funds are used, the profitability, the operating efficiency and the financial and operating leverages of the company. For this purpose, certain fundamental ratios have to be calculated.

From the investment point of view, the most important figures are earnings per share, price earning ratios, yield, book value and the intrinsic value of the share. These five elements may be calculated for the past 10 years or so and compared with similar ratios computed from the financial accounts of other companies in the industry and with the average ratios for the industry as a whole. The yield and the asset backing of a share are important considerations in a decision regarding whether the particular market price of the share is proper or not.

Various other ratios to measure profitability, operating efficiency and turnover efficiency of the company may also be calculated. The return on owners' investment, capital turnover ratio and the cost structure ratios may also be worked out.

To examine the financial solvency or liquidity of the company, the investment manager may work out current ratio, liquidity ratio, debt-equity ratio, etc. These ratios will provide an overall view of the company to the investment analyst. He can analyse its strengths and weaknesses and see whether it is worth the risk or not.

(g) Quality of Management: This is an intangible factor. Yet it has a very important bearing on the value of the shares. Every investment manager knows that the shares of certain business houses command a higher premium than those of similar companies managed by other business houses. This is because of the quality of management, the confidence that investors have in a particular business house, its policy vis-a-vis its relationship with the investors, dividend and financial performance record of other companies in the same group, etc. This is perhaps the reason that an investment manager always gives a close look to the management of a company in whose shares he is to invest. Quality of management has to be seen with reference to the experience, skills and integrity of the persons at the helm of affairs of the company. The policy of the management regarding relationship with the shareholders is an important factor since certain business houses believe in very generous dividend and bonus distributions while others are rather conservative.

(h) Location and Labour-Management Relations: The locations of the company's manufacturing facilities determines its economic viability which depends on the availability of crucial inputs like power, skilled labour and raw-materials, etc. Nearness to markets is also a factor to be considered.

In the past few years, the investment manager has begun looking into the state of labour-management relations in the company under consideration and the area where it is located.

(i) Pattern of Existing Stock Holding: An analysis of the pattern of existing stock holdings of the company would also be relevant. This would show the stake of various parties in the company. An interesting case in this regard is that of the Punjab National Bank in which the Life Insurance Corporation and other financial institutions had substantial holdings. When the bank was nationalised, the residual company proposed a scheme whereby those shareholders, who wish to opt out, could receive a certain amount as compensation in cash. It was only at the instance and the bargaining strength, of institutional investors that the compensation offered to the shareholders, who wished to opt out of the company, was raised considerably.

(j) Marketability of the Shares: Another important consideration for an investment manager is the marketability of the shares of the company. Mere listing of a share on the stock exchange does not automatically mean that the share can be sold or purchased at will. There are many shares which remain inactive for long periods with no transactions being effected. To purchase or sell such scrips is a difficult task. In this regard, dispersal of shareholding with special reference to the extent of public holding should be seen. The other relevant factors are the speculative interest in the particular scrip, the particular stock exchange where it is traded and the volume of trading.

2.4.1 Techniques Used in Company Analysis: Through the use of statistical techniques the company wide factors can be analysed. Some of the techniques are discussed as under:

(a) Correlation & Regression Analysis: Simple regression is used when inter relationship covers two variables. For more than two variables, multiple regression analysis is followed. Here the inter relationship between variables belonging to economy, industry and company are found out. The main advantage in such analysis is the determination of the forecasted values along with testing the reliability of the estimates.

(b) Trend Analysis: The relationship of one variable is tested over time using regression analysis. It gives an insight to the historical behavior of the variable.

(c) Decision Tree Analysis: Information relating to the probability of occurrence of the forecasted value is considered useful. A range of values of the variable with probabilities of occurrence of each value is taken up. The limitations are reduced through decision tree analysis and use of simulation techniques.

6.12 Strategic Financial Management

In decision tree analysis, the decision is taken sequentially with probabilities attached to each sequence. To obtain the probability of final outcome, various sequential decisions given along with probabilities, their probabilities of each sequence is to be multiplied and then summed up.

Thus, fundamental analysis is basically an examination of the economic and financial aspects of a company with the aim of estimating future earnings and dividend prospects. It includes an analysis of the macro-economic and political factors which will have an impact on the performance of the company. After having analysed all the relevant information about the company and its relative strength vis-a-vis other companies in the industry, the investor is expected to decide whether he should buy or sell the securities.

Apart from these, the Group Analysis has also become an important factor. SEBI, in particular, emphasizes the need for disclosure, in public offer documents, of all relevant parameters – especially the financial health and promise versus performance of the group companies. RBI has also been focusing more and more on the Group Exposure Norms of commercial Banks.

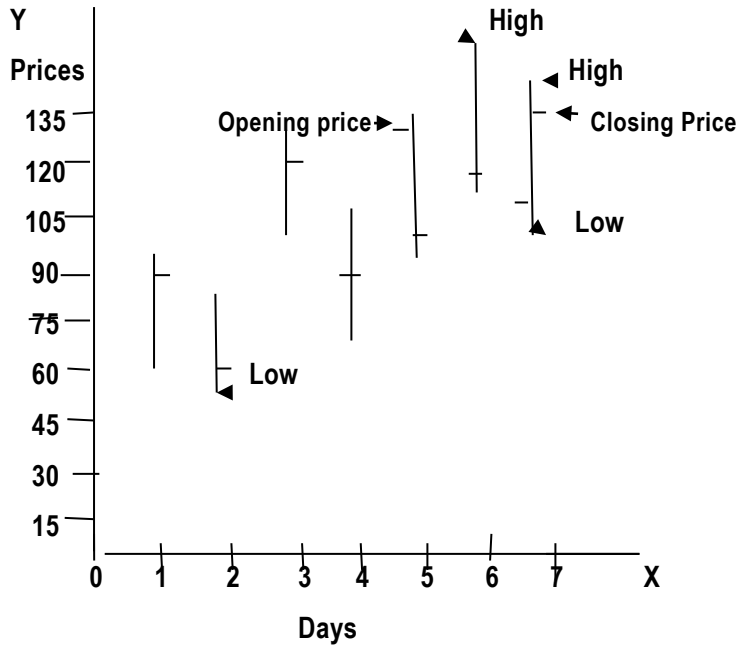
3. Technical Analysis

Technical Analysis is a method of share price movements based on a study of price graphs or charts on the assumption that share price trends are repetitive, that since investor psychology follows a certain pattern, what is seen to have happened before is likely to be repeated. The technical analyst is concerned with the fundamental strength or weakness of a company or an industry; he studies investor and price behaviour.

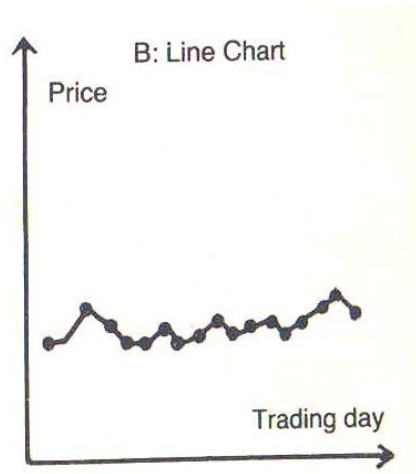
A technical analyst attempts precisely that. The two basic questions that he seeks to answer are: (i) Is there a discernible trend in the prices? (ii) If there is, then are there indications that the trend would reverse? The methods used to answer these questions are visual and statistical. The visual methods are based on examination of a variety of charts to make out patterns, while the statistical procedures analyse price and return data to make trading decisions.

Technical analysts use three types of charts for analyzing data. They are:

(i) Bar Chart: In a bar chart, the highest price, the lowest price and the closing price of each day are shown on a daily basis. The highest and lowest price of a particular day has been shown through a vertical line on the bar chart. The highest price of the day is shown on the top of the bar chart. And, the lowest price of the day is shown on the bottom of the bar chart. Moreover, closing price of the day is visible in the form of a small horizontal hash on the right hand side of the bar. Also, opening price is shown as a hash on the left side of the bar chart. The bar chart has been explained in the following diagram as depicted below:



(ii) **Line Chart:** In a line chart, lines are used to connect successive day's prices. The closing price for each period is plotted as a point. These points are joined by a line to form the chart. The period may be a day, a week or a month.



(iii) **Point and Figure Chart:** Point and Figure charts are more complex than line or bar charts. They are used to detect reversals in a trend. For plotting a point and figure chart, we have to first decide the box size and the reversal criterion. The box size is the value of each box on the chart, for example each box could be Re.1, ₹ 2 or ₹ 0.50. The smaller the box size, the more sensitive would the chart be to price change. The reversal criterion is the number of boxes required to be retraced to record prices in the next column in the opposite direction.

6.14 Strategic Financial Management

<u>Period</u>	<u>Price</u>							
		30						
1	24	29						
2	26	28	X					
3	27	27	X					
4	26	26	X					
5	28	25	X	O				
6	27	24	X	O				
7	26	23		O				
8	25	22						
9	26							
10	23							

3.1 General Principles and Methods of Technical Analysis

3.1.1 The Dow Theory: The Dow Theory is one of the oldest and most famous technical theories. It was originated by Charles Dow, the founder of Dow Jones Company in late nineteenth century. It is a helpful tool for determining the relative strength of the stock market. It can also be used as a barometer of business.

The Dow Theory is based upon the movements of two indices, constructed by Charles Dow, Dow Jones Industrial Average (DJIA) and Dow Jones Transportation Average (DJTA). These averages reflect the aggregate impact of all kinds of information on the market. The movements of the market are divided into three classifications, all going at the same time; the primary movement, the secondary movement, and the daily fluctuations. The primary movement is the main trend of the market, which lasts from one year to 36 months or longer. This trend is commonly called bear or bull market. The secondary movement of the market is shorter in duration than the primary movement and is opposite in direction. It lasts from two weeks to a month or more. The daily fluctuations are the narrow movements from day-to-day. These fluctuations are not part of the Dow Theory interpretation of the stock market. However, daily movements must be carefully studied, along with primary and secondary movements, as they go to make up the longer movement in the market.

Thus, the Dow Theory's purpose is to determine where the market is and where is it going, although not how far or high. The theory, in practice, states that if the cyclical swings of the stock market averages are successively higher and the successive lows are higher, then the market trend is up and a bullish market exists. On the contrary, if the successive highs and successive lows are lower, then the direction of the market is down and a bearish market exists.

Charles Dow proposed that the primary uptrend would have three moves up, the first one being caused by accumulation of shares by the far-sighted, knowledgeable investors, the second move would be caused by the arrival of the first reports of good earnings by

corporations, and the last move up would be caused by widespread report of financial well-being of corporations. The third stage would also see rampant speculation in the market. Towards the end of the third stage, the far-sighted investors, realizing that the high earnings levels may not be sustained, would start selling, starting the first move down of a downtrend, and as the non-sustainability of high earnings is confirmed, the second move down would be initiated and then the third move down would result from distress selling in the market.

3.1.2 Market Indicators

(i) **Breadth Index:** It is an index that covers all securities traded. It is computed by dividing the net advances or declines in the market by the number of issues traded. The breadth index either supports or contradicts the movement of the Dow Jones Averages. If it supports the movement of the Dow Jones Averages, this is considered sign of technical strength and if it does not support the averages, it is a sign of technical weakness i.e. a sign that the market will move in a direction opposite to the Dow Jones Averages. The breadth index is an addition to the Dow Theory and the movement of the Dow Jones Averages.

(ii) **Volume of Transactions:** The volume of shares traded in the market provides useful clues on how the market would behave in the near future. A rising index/price with increasing volume would signal buy behaviour because the situation reflects an unsatisfied demand in the market. Similarly, a falling market with increasing volume signals a bear market and the prices would be expected to fall further. A rising market with decreasing volume indicates a bull market while a falling market with dwindling volume indicates a bear market. Thus, the volume concept is best used with another market indicator, such as the Dow Theory.

(iii) **Confidence Index:** It is supposed to reveal how willing the investors are to take a chance in the market. It is the ratio of high-grade bond yields to low-grade bond yields. It is used by market analysts as a method of trading or timing the purchase and sale of stock, and also, as a forecasting device to determine the turning points of the market. A rising confidence index is expected to precede a rising stock market, and a fall in the index is expected to precede a drop in stock prices. A fall in the confidence index represents the fact that low-grade bond yields are rising faster or falling more slowly than high grade yields. The confidence index is usually, but not always a leading indicator of the market. Therefore, it should be used in conjunction with other market indicators.

(iv) **Relative Strength Analysis:** The relative strength concept suggests that the prices of some securities rise relatively faster in a bull market or decline more slowly in a bear market than other securities i.e. some securities exhibit relative strength. Investors will earn higher returns by investing in securities which have demonstrated relative strength in the past because the relative strength of a security tends to remain undiminished over time.

Relative strength can be measured in several ways. Calculating rates of return and classifying those securities with historically high average returns as securities with high relative strength is one of them. Even ratios like security relative to its industry and security relative to the entire market can also be used to detect relative strength in a security or an industry.

(v) **Odd - Lot Theory:** This theory is a contrary - opinion theory. It assumes that the average person is usually wrong and that a wise course of action is to pursue strategies contrary to

6.16 Strategic Financial Management

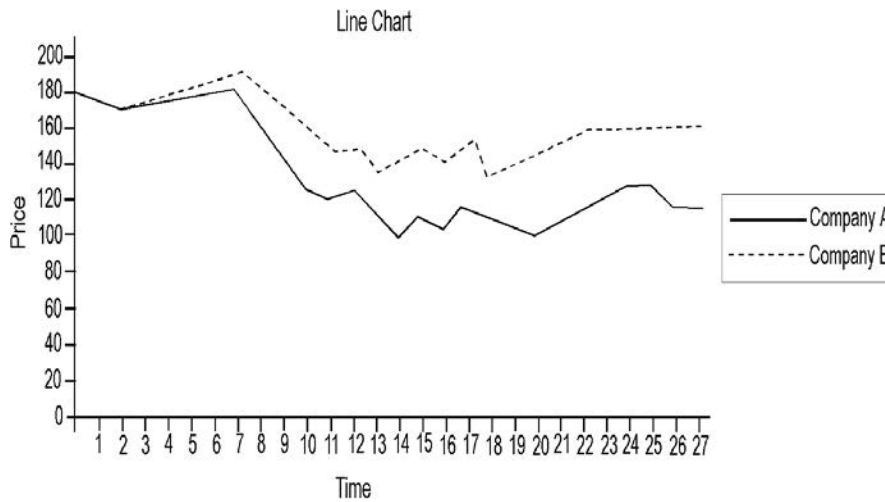
popular opinion. The odd-lot theory is used primarily to predict tops in bull markets, but also to predict reversals in individual securities.

3.1.3 Support and Resistance Levels: When the index/price goes down from a peak, the peak becomes the resistance level. When the index/price rebounds after reaching a trough subsequently, the lowest value reached becomes the support level. The price is then expected to move between these two levels. Whenever the price approaches the resistance level, there is a selling pressure because all investors who failed to sell at the high would be keen to liquidate, while whenever the price approaches the support level, there is a buying pressure as all those investors who failed to buy at the lowest price would like to purchase the share. A breach of these levels indicates a distinct departure from status quo, and an attempt to set newer levels. Let us get a better understanding about these levels by using price data for about two months for shares of companies A and B given in the following Table:

Date	A	B
Dec. 1, 2005	177	177
5	171	171.5
7	172	175.5
12	174	177
13	177.5	181
14	181	184
15	180	186.5
18	163	176
19	142	162.5
20	127	156
22	123	147
25	124	147
Jan. 3, 2006	107.5	137.5
4	97.5	140
8	105	145
10	102.5	143.75
12	108.75	150
15	100	142.5
25	95	135
26	91.25	133.75
Feb. 1	97.5	138.75
2	106.25	147.5
5	113.75	152.5

6	120	155
7	120	152.5
8	113.75	150
9	113.75	147.5

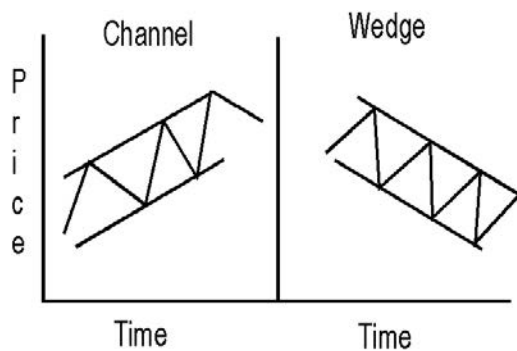
The line charts for Company A and Company B shares are shown in the graph below. From the charts, it appears that the support level and resistance level for Company A at that time were about ₹ 100 and ₹ 125, while these levels for Company B were ₹ 140 and ₹ 160.



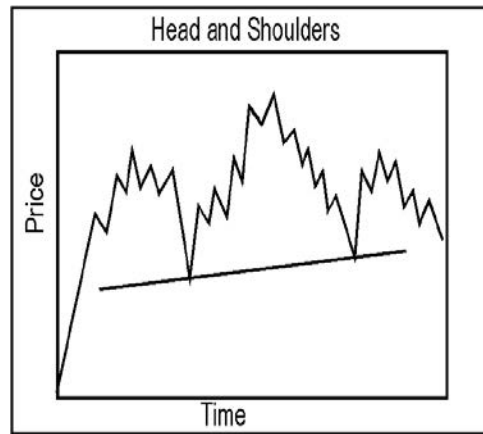
3.1.4 Interpreting Price Patterns: There are numerous price patterns documented by technical analysts but only a few and important of them have been discussed here:

(a) Channel: A series of uniformly changing tops and bottoms gives rise to a channel formation. A downward sloping channel would indicate declining prices and an upward sloping channel would imply rising prices.

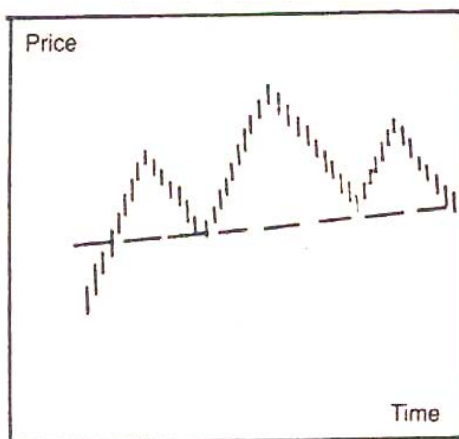
(b) Wedge: A wedge is formed when the tops (resistance levels) and bottoms (support levels) change in opposite direction (that is, if the tops, are decreasing then the bottoms are increasing and vice versa), or when they are changing in the same direction at different rates over time.



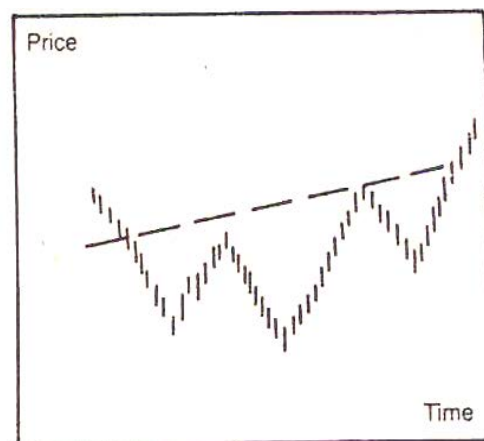
(c) **Head and Shoulders:** It is a distorted drawing of a human form, with a large lump (for head) in the middle of two smaller humps (for shoulders). This is perhaps the single most important pattern to indicate a reversal of price trend. The neckline of the pattern is formed by joining points where the head and the shoulders meet. The price movement after the formation of the second shoulder is crucial. If the price goes below the neckline, then a drop in price is indicated, with the drop expected to be equal to the distance between the top of the head and the neckline.



- (i) *Head and Shoulder Top Pattern:* This has a left shoulder, a head and a right shoulder. Such formation represents bearish development. If the price falls below the neck line (line drawn tangentially to the left and right shoulders) a price decline is expected. Hence it's a signal to sell.
- (ii) *Inverse Head and Shoulder Pattern:* As the name indicates this formation, it is an inverse of head and shoulder top formation. Hence it reflects a bullish development. The price rise to above the neck line suggests price rise is imminent and a signal to purchase.



HEAD & SHOULDERS



INVERSE HEAD & SHOULDERS

(d) **Triangle or Coil Formation:** This formation represents a pattern of uncertainty and is difficult to predict which way the price will break out.

(e) **Flags and Pennants Form:** This form signifies a phase after which the previous price trend is likely to continue.



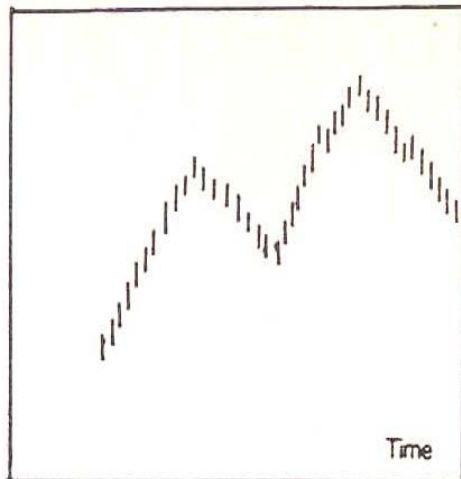
TRIANGLE OR COIL



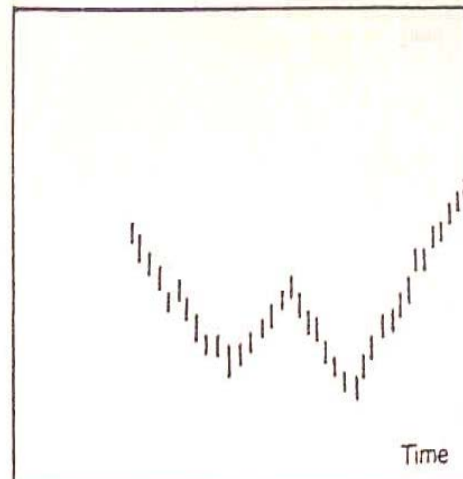
FLAG & PENNANT

(f) **Double Top Form:** This form represents a bearish development, signals that price is expected to fall.

(g) **Double Bottom Form:** This form represents bullish development signaling price is expected to rise.



DOUBLE TOP



DOUBLE BOTTOM

(h) **Gap:** A gap is the difference between the opening price on a trading day and the closing price of the previous trading day. The wider the gap the stronger the signal for a continuation of the observed trend. On a rising market, if the opening price is considerably higher than the

6.20 Strategic Financial Management

previous closing price, it indicates that investors are willing to pay a much higher price to acquire the scrip. Similarly, a gap in a falling market is an indicator of extreme selling pressure.

3.1.5 Decision Using Data Analysis: Technical analysts have developed rules based on simple statistical analysis of price data. Moving Averages is one of the more popular methods of data analysis for decision making.

(a) Moving Averages: Moving averages are frequently plotted with prices to make buy and sell decisions. The two types of moving averages used by chartists are the Arithmetic Moving Average (AMA) and the Exponential Moving Average (EMA). An n -period AMA, at period t , is nothing but the simple average of the last n period prices.

$$AMA_{n,t} = 1/n[P_t + P_{t-1} + \dots + P_{t-(n-1)}]$$

To identify trend, technical analysts use moving average analysis:

- (i) A 200 day's moving average of daily prices or a 30 week moving of weekly price for identifying a long term trend.
- (ii) A 60 day's moving average of daily price to discern an intermediate term trend.
- (iii) A 10 day's moving average of daily price to detect a short term trend.

For example Moving Average is calculated by considering the most recent observation for which the closing price of a stock on '10' successive trading days are taken into account for the calculation of a 5 -day moving average of daily closing prices.

Trading day	Closing prices	Sum of 5 most recent closing price	Two-item Centred Total	Moving Average
1	25.00			
2	26.00			
3	25.50			
4	24.50			
5	26.00	127.00		
6	26.00	128.00	255.00	25.50
7	26.50	128.50	256.50	25.65
8	26.50	129.50	258.00	25.80
9	26.00	131.00	260.50	26.05
10	27.00	132.00	263.00	26.30

Buy and Sell Signals Provided by Moving Average Analysis

<i>Buy Signal</i>	<i>Sell Signal</i>
(a) Stock price line rise through the moving average line when graph of the moving average line is flattering out.	(a) Stock price line falls through moving average line when graph of the moving average line is flattering out.
(b) Stock price line falls below moving average line which is rising.	(b) Stock price line rises above moving average line which is falling.
(c) Stock price line which is above moving average line falls but begins to rise again before reaching the moving average line	(c) Stock price line which is slow moving average line rises but begins to fall again before reaching the moving average line.

(b) Exponential Moving Average: Unlike the AMA, which assigns equal weight of $1/n$ to each of the n prices used for computing the average, the Exponential Moving Average (EMA) assigns decreasing weights, with the highest weight being assigned to the latest price. The weights decrease exponentially, according to a scheme specified by the exponential smoothing constant, also known as the exponent, a .

$$EMA_t = aP_t + (1-a)(EMA_{t-1})$$

$$\text{Where, } a \text{ (exponent)} = \frac{2}{n+1}$$

P_t = Price of today

EMA_{t-1} = Previous day's EMA

Or

$$EMA_t = (\text{Closing Price of the day} - \text{EMA of Previous Day}) \times \text{Exponent} + \text{Previous day EMA}$$

Illustration 1

Closing values of BSE Sensex from 6th to 17th day of the month of January of the year 200X were as follows:

<i>Days</i>	<i>Date</i>	<i>Day</i>	<i>Sensex</i>
1	6	THU	14522
2	7	FRI	14925
3	8	SAT	No Trading
4	9	SUN	No Trading
5	10	MON	15222
6	11	TUE	16000
7	12	WED	16400

6.22 Strategic Financial Management

8	13	THU	17000
9	14	FRI	No Trading
10	15	SAT	No Trading
11	16	SUN	No Trading
12	17	MON	18000

Calculate Exponential Moving Average (EMA) of Sensex during the above period. The previous day exponential moving average of Sensex can be assumed as 15,000. The value of exponent for 31 days EMA is 0.062.

Give detailed analysis on the basis of your calculations.

Solution

Date	1 Sensex	2 EMA for Previous day	3 1-2	4 3×0.062	5 EMA $2 + 4$
6	14522	15000	(478)	(29.636)	14970.364
7	14925	14970.364	(45.364)	(2.812)	14967.55
10	15222	14967.55	254.45	15.776	14983.32
11	16000	14983.32	1016.68	63.034	15046.354
12	16400	15046.354	1353.646	83.926	15130.28
13	17000	15130.28	1869.72	115.922	15246.203
17	18000	15246.203	2753.797	170.735	15416.938

Conclusion – The market is bullish. The market is likely to remain bullish for short term to medium term if other factors remain the same. On the basis of this indicator (EMA) the investors/brokers can take long position.

3.2 Evaluation of Technical Analysis: Technical Analysis has several supporters as well several critics. The advocates of technical analysis offer the following interrelated argument in their favour:

- Under influence of crowd psychology trend persist for some time. Tools of technical analysis help in identifying these trends early and help in investment decision making.
- Shift in demand and supply are gradual rather than instantaneous. Technical analysis helps in detecting this shift rather early and hence provides clues to future price movements.
- Fundamental information about a company is observed and assimilated by the market over a period of time. Hence price movement tends to continue more or less in same direction till the information is fully assimilated in the stock price.

Detractors of technical analysis believe that it is an useless exercise; their arguments are as follows:

- Most technical analysts are not able to offer a convincing explanation for the tools employed by them.

- (b) Empirical evidence in support of random walk hypothesis cast its shadow over the usefulness of technical analysis.
- (c) By the time an up trend and down trend may have been signalled by technical analysis it may already have taken place.
- (d) Ultimately technical analysis must be self defeating proposition. With more and more people employing it, the value of such analysis tends to decline.

In a nutshell, it may be concluded that in a rational, well ordered and efficient market, technical analysis may not work very well. However with imperfection, inefficiency and irrationalities that characterizes the real world market, technical analysis may be helpful. If technical analysis is used in conjunction with fundamental analysis, it might be useful in providing proper guidance to investment decision makers.

4. Bond Valuation

A bond or debenture is an instrument of debt issued by a business or government.

4.1 Some Basics of a Bond

(a) Par Value: Value stated on the face of the bond. It is the amount a firm borrows and promises to repay at the time of maturity.

(b) Coupon Rate and Frequency of Payment: A bond carries a specific interest rate known as the coupon rate. The interest payable to the bond holder is par value of the bond × coupon rate. If, the annual interest payable on a bond with a par value of ₹ 100 and a coupon rate of 13.5 percent is ₹ 13.50 (₹ 100 × 13.5 per cent). The frequency of payment of interest also needs to be specified (e.g. payable annually, semi annually, quarterly or monthly)

(c) Maturity Period: Corporate bonds have a maturity period of 3 to 10 years, while government bonds can have maturity periods extending up to 30 years.

(d) Redemption: Bullet i.e. one shot repayment of principal (it could be in installments as well) at par (could be at some premium also)

4.2 Bond Valuation Model: The holder of a bond receives a fixed annual interest payment for a certain number of years and a fixed principal repayment (equal to par value) at the time of maturity. So the value of a bond is:

$$V = \sum_{t=1}^n \frac{I}{(1+k_d)^t} + \frac{F}{(1+k_d)^n}$$

$$V = I(PVIFA_{k_d,n}) + F(PVIF_{k_d,n})$$

Where,

V = value of the bond

I = annual interest payable on the bond, assuming annual interest payments

F = principal amount (par value) of the bond repayable at the time of maturity,

6.24 Strategic Financial Management

assuming bullet redemption at par.

n = maturity period of the bond.

Illustration 2

A ₹ 1,000 par value bond bearing a coupon rate of 14 per cent matures after 5 years, the required rate of return on this bond is 13 per cent. Calculate the value of the bond.

Solution

The value of the bond is

$$\begin{aligned} V &= ₹ 140(\text{PVIFA}_{13\%, 5\text{yrs}}) + ₹ 1,000(\text{PVIF}_{13\%, 5\text{yrs}}) \\ &= ₹ 140(3.517) + ₹ 1,000(0.543) \\ &= ₹ 1,035.4 \end{aligned}$$

4.3 Bond Value Theorems: Some Basic Rules which should be remembered with regard to Bonds are:

- When the required rate of return equals the coupon rate, the bond sells at par value.
- When the required rate of return exceeds the coupon rate, the bond sells at a discount. The discount declines as maturity approaches.
- When the required rate of return is less than the coupon rate, the bond sells at a premium. The premium declines as maturity approaches.
- The longer the maturity of a bond, the greater is its price change with a given change in the required rate of return.

4.4 Yield to Maturity: If the market price of a ₹ 1,000 par value bond, carrying a coupon rate of 9 per cent and maturing after 8 years with a bullet redemption at par, is ₹ 800. What would be the rate of return, if one buys the bond and holds it till its maturity? The rate of return one earns is called the Yield to Maturity (YTM). The YTM is defined as that value of the discount rate (" k_d ") for which the Intrinsic Value of the Bond equals its Market Price (Note the similarity between YTM of a Bond and IRR of a Project). If we ignore the issue related expenses, k_d equals the relevant cost of (debt) capital for the company.

$$= ₹ 90(\text{PVIFA}_{k_d, 8\text{yrs}}) + ₹ 1,000(\text{PVIF}_{k_d, 8\text{yrs}})$$

To find the value of k_d , several values of k_d are considered till the right value is obtained. With a discount rate of 12 per cent and putting a value of 12 per cent for k_d the right-hand side becomes

$$₹ 90 (\text{PVIFA}_{12\%, 8\text{yrs}}) + ₹ 1,000 (\text{PVIF}_{12\%, 8\text{yrs}}) = ₹ 90 (4.968) + ₹ 1,000(0.404) = ₹ 851.00$$

Since this value is greater than ₹ 800 a higher value for k_d is opted. Let $k_d = 14$ per cent so that

$$₹ 90(\text{PVIFA}_{14\%, 8\text{yrs}}) + ₹ 1,000 (\text{PVIF}_{14\%, 8\text{yrs}}) = ₹ 90(4.639) + ₹ 1,000(0.351) = ₹ 768.10$$

Since this value is less than ₹ 800 a lower value for k_d is used. Let us try $k_d = 13$ per cent.

$$₹ 90(PVIFA_{13\%,8yrs}) + ₹ 1,000 (PVIF_{13\%,8yrs}) = ₹ 90 (4.800) + ₹ 1,000(0.376) = ₹ 808$$

Thus k_d lies between 13 per cent and 14 per cent. Using linear interpolation in the range of 13 percent to 14 percent, k_d is equal to 13.2 per cent

$$13\% + (14\% - 13\%) \frac{808 - 800}{808 - 768.1} = 13.2\%$$

Illustration 3

If the price per bond is ₹ 90 and the bond has a par value of ₹ 100, a coupon rate of 14 per cent, and a maturity period of 6 years, calculate its yield to maturity.

Solution

$$₹ 90 = \sum_{t=1}^6 \frac{₹ 14}{(1+k_d)^t} + \frac{₹ 100}{(1+k_d)^6} = ₹ 14(PVIFA_{k_d,6yrs}) + ₹ 100(PVIF_{k_d,6yrs})$$

To find the value of k_d , several values of k_d are considered till the right value is obtained. With a discount rate of 14 percent and putting a value of 14 per cent for k_d the right-hand side becomes ₹ 14 (PVIFA14%, 6yrs) + ₹ 100 (PVIF14%, 6yrs) = ₹ 14 (3.889) + ₹ 100(0.456) = ₹ 100.046

Since this value is greater than ₹ 90 a higher value for k_d is opted. Let $k_d = 17$ per cent so that ₹ 14(PVIFA17%,6yrs) + ₹ 100 (PVIF17%,6yrs) = ₹ 14(3.589) + ₹ 100(0.390) = ₹ 89.246

Thus k_d lies between 14 per cent and 17 per cent. Using linear interpolation in the range of 14 percent to 17 percent, k_d is equal to 16.79 per cent

$$14\% + (17\% - 14\%) \frac{100.046 - 90}{100.046 - 89.246}$$

4.5 Bond Values with Semi-Annual Interest: Bonds pay interest semi-annually. This requires the bond valuation equation to be modified as follows:

- (a) The annual interest payment, I , divided by two to obtain the semi-annual interest payment.
- (b) The number of years to maturity is multiplied by two to get the number of half-yearly periods.
- (c) The discount rate divided by two to get the discount rate applicable to half-yearly periods.

The basic bond valuation equation thus becomes:

$$V = \sum_{t=1}^{2n} \left[\frac{I/2}{(1+k_d/2)^t} \right] + \left[\frac{F}{(1+k_d/2)^{2n}} \right]$$

$$= I/2(PVIFA_{k_d/2,2n}) + F(PVIF_{k_d/2,2n})$$

Where,

- V = Value of the bond
 $I/2$ = Semi-annual interest payment

6.26 Strategic Financial Management

$K_d/2$ = Discount rate applicable to a half-year period

F = Par value of the bond repayable at maturity

$2n$ = Maturity period expressed in terms of half-yearly periods.

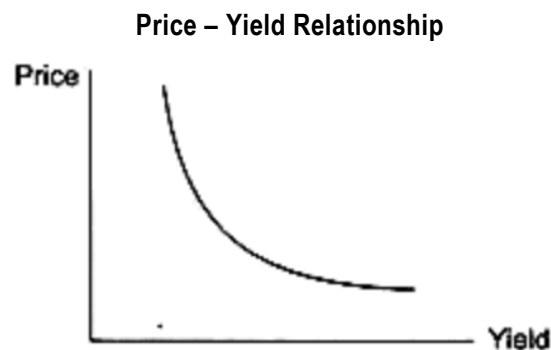
Illustration 4

If a ₹ 100 par value bond carries a coupon rate of 12 per cent and a maturity period of 8 years and interest payable semi-annually then the value of the bond with required rate of return of 14 per cent will be what?

Solution

$$\begin{aligned} V &= \sum_{t=1}^{16} \{6 / (1.07)^t\} + \{100 / (1.07)^{16}\} \\ &= 6(\text{PVIFA}_{7\%, 16\text{yrs}}) + 100(\text{PVIF}_{7\%, 16\text{yrs}}) \\ &= ₹ 6(9.447) + ₹ 100(0.339) = ₹ 90.58 \end{aligned}$$

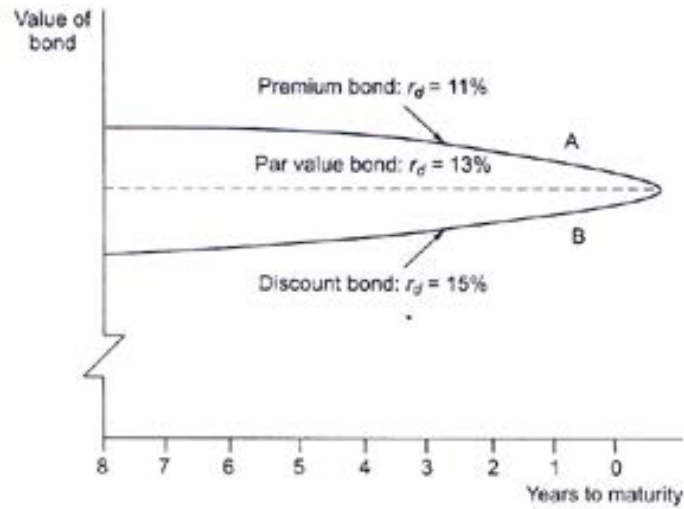
4.6 Price-Yield Relationship: One of the property of a bond is that its price (value) varies inversely with its yield because as the required yield increases, the present value of the cash flow decreases; hence the price decreases. On the other hand, when the required yield decreases, the present value of the cash flow increases; hence the price increases. The price-yield relationship for any callable bond has a convex shape as shown in following diagram.



4.7 Relationship between Bond Price and Time: Since the price of a bond must equal its par value at maturity (assuming that there is no risk of default), bond prices change with time. For example, a bond that is redeemable for ₹ 1000 (which is its par value) after five years when it matures, will have a price of ₹ 1,000 at maturity, no matter what the current price is. If its current price is ₹ 1,100, it is said to be a premium bond. If the required yield does not change between now and the maturity date, the premium will decline over time as shown by curve A in the following diagram. On the other hand, if the bond has a current price of ₹ 900, it is said to be a discount bond. The discount too will disappear over time as shown by curve B in the same diagram. Only when the current price is equal to par value – in such a

case only the bond is said to be a par bond – there is no change in price as time passes, assuming that the required yield does not change between now and the maturity date. This is reflected by the dashed line in the diagram.

Price Changes with Time

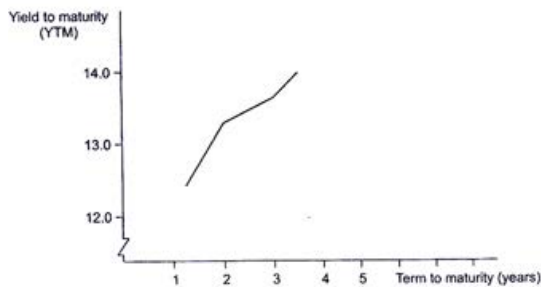


4.8 The Yield Curve: The term structure of interest rates, popularly known as Yield Curve, shows how yield to maturity is related to term to maturity for bonds that are similar in all respects, except maturity.

Consider the following data for Government securities:

Face Value	Interest Rate	Maturity (years)	Current Price	Yield to Maturity
10,000	0	1	8,897	12.40
10,000	12.75	2	9,937	13.13
10,000	13.50	3	10,035	13.35
10,000	13.50	4	9,971	13.60
10,000	13.75	5	9,948	13.90

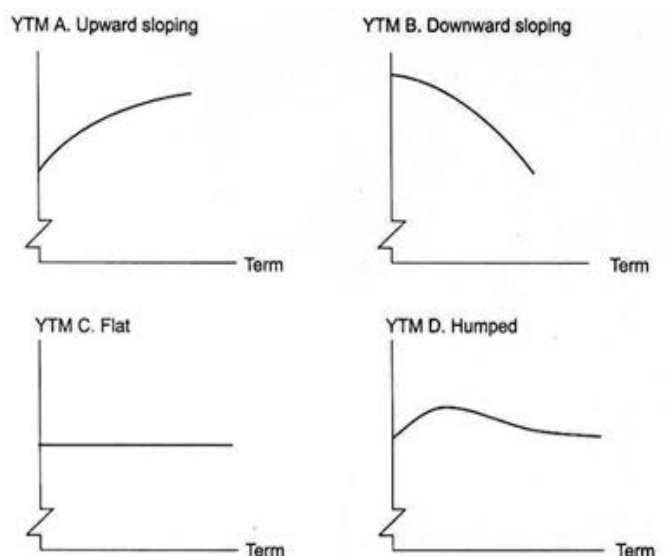
The yield curve for the above bonds is shown in the diagram. It slopes upwards indicating that long-term rates are greater than short-term rates.



6.28 Strategic Financial Management

Yield curves, however, do not have to necessarily slope upwards. They may follow any pattern. Four patterns are depicted in the given diagram:

Types of Yield Curve



Another perspective on the term structure of interest rates is provided by the forward interest rates, viz., the interest rates applicable to bonds in the future.

To get forward interest rates, begin with the one-year Treasury bill:

$$8,897 = 10,000 / (1 + r_1)$$

Where,

r_1 is the one-year spot rate i.e. the discount rate applicable to a risk less cash flow receivable a year hence.

Solving for r_1 , we get $r_1 = 0.124$.

Next, consider the two-year government security and split its benefits into two parts, the interest of ₹ 1,275 receivable at the end of year 1 and ₹ 11,275 (representing the interest and principal repayment) receivable at the end of year 2. The present value of the first part is:

$$\frac{1,275}{(1 + r_1)} = \frac{1,275}{1.124} = 1,134$$

To get the present value of the second year's cash flow of ₹ 11,275, discount it twice at r_1 (the discount rate for year 1) and r_2 (the discount rate for year 2)

$$\frac{1,275}{(1 + r_1)(1 + r_2)} = \frac{1,275}{1.124(1 + r_2)}$$

r_2 is called the 'forward rate' for year two, i.e., the current estimate of the next year's one-year

spot interest rate. Since r_1 , the market price of the bond, and the cash flow associated with the bond are known the following equation can be set up:

$$9,937 = \frac{1,275}{(1.124)} + \frac{11,275}{(1.124)(1+r_2)}$$

$$9,937(1.124)(1+r_2) = 1,275(1+r_2) + 11,275$$

$$11,169 + 11,169 r_2 = 1,275 + 1,275 r_2 + 11,275$$

$$11,169 r_2 - 1,275 r_2 = 11,275 - 11,169 + 1,275$$

$$9,894 r_2 = 1,381$$

$$r_2 = \frac{1,381}{9,894} = 0.1396$$

Thus solving this equation we get $r_2 = 0.1396$

To get the forward rate for year 3 (r_3), set up the equation for the value of the three year bond:

$$10,035 = \frac{1,350}{(1+r_1)} + \frac{1,350}{(1+r_1)(1+r_2)} + \frac{11,350}{(1+r_1)(1+r_2)(1+r_3)}$$

$$10,035 = \frac{1,350}{(1.124)} + \frac{1,350}{(1.124)(1.140)} + \frac{11,350}{(1.124)(1.140)(1+r_3)}$$

$$10,035 = \frac{1,350}{1.124} + \frac{1,350}{1.28136} + \frac{11,350}{1.28136(1+r_3)}$$

$$10,035 = 1,201 + 1,054 + \frac{11,350}{1.28136(1+r_3)}$$

$$7781 = \frac{11,350}{1.28136(1+r_3)}$$

$$1+r_3 = 1.134845$$

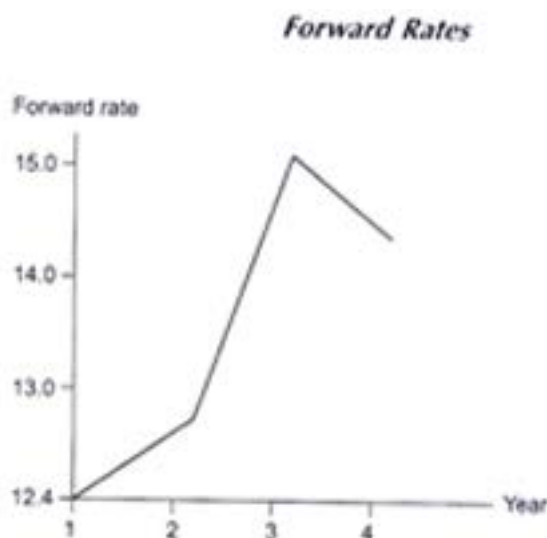
$$r_3 = 0.13845$$

Solving this equation we get $r_3=0.13845$. This is the forward rate for year three. Continuing in a similar fashion, set up the equation for the value of the four-year bond:

$$9,971 = \frac{1,350}{(1+r_1)} + \frac{1,350}{(1+r_1)(1+r_2)} + \frac{1,350}{(1+r_1)(1+r_2)(1+r_3)} + \frac{11,350}{(1+r_1)(1+r_2)(1+r_3)(1+r_4)}$$

Solving this equation we get $r_4 = 0.1458$. The following diagram plots the one-year spot rate and forward rates r_2, r_3, r_4 . It can be noticed that while the current spot rate and forward rates are known, the future spot rates are not known – they will be revealed as the future unfolds.

6.30 Strategic Financial Management



Thus, on the basis of above it can be said that though YTM and Forward Rates are two distinct measures but used equivalent way of evaluating a riskless cash flows.

$$\text{Discount at the yield to maturity : } (R_t) \text{ PV [CF(t)]} = \frac{\text{CF(t)}}{(1+R_t)^t}$$

Discount by the product of a spot rate plus the forward rates

$$\text{PV [CF(t)]} = \frac{\text{CF(t)}}{(1+r_1)(1+r_2)\dots(1+r_t)}$$

4.9 Duration of Bond: The concept of duration is straightforward. It measures how quickly a bond will repay its true cost. The longer the time it takes the greater exposure the bond has to changes in the interest rate environment. It is an important tool in structuring and managing a fixed income securities. Following are some of factors that affect bond's duration:

- (1) **Time to maturity:** Consider two bonds that each cost ₹ 1,000 and yield 7%. A bond that matures in one year would more quickly repay its true cost than a bond that matures in 10 years. As a result, the shorter-maturity bond would have a lower duration and less price risk. The longer the maturity, the higher the duration.
- (2) **Coupon rate:** Coupon payment is a key factor in calculation of duration of bonds. If two identical bonds pay different coupons, the bond with the higher coupon will pay back its original cost quicker than the lower-yielding bond. The higher the coupon, the lower is the duration.

Duration can also be used to measure risk of investment in bonds. Although there are many formulae to calculate the duration. However, following are commonly used methods:

(a) Macaulay Duration: This method was developed by Frederic Macaulay. This formula measures the number of years required to recover the true cost of a bond, considering the present value of all coupon and principal payments received in the future. Macaulay duration is calculated by adding the results of multiplying the present value of each cash flow by the time it is received and dividing by the total price of the security. The formula for Macaulay duration is as follows:

$$\text{Macaulay Duration} = \frac{\sum_{t=1}^n \frac{t \cdot C}{(1+i)^t} + \frac{n \cdot M}{(1+i)^n}}{P}$$

Where

n = Number of cash flows

t = Time to maturity

C = Cash flows

i = Required yield (YTM)

M = Maturity (par) value

P = Bond price

This is only the duration which is calculated in years.

(b) Short Cut Method: The duration can also be calculated if figure of Coupon Yield (c), YTM (y) and Time to Maturity (t) is given the duration shall be calculated as follows:

$$= \frac{1+y}{y} - \frac{(1+y)^t + t(c-y)}{c[(1+y)^t - 1] + y}$$

(c) Modified Duration: This is a modified version of Macaulay duration which takes into account the interest rate changes because the changes in interest rates affect duration as the yield gets affected each time the interest rate varies.

In other words it indicates the volatility of Bond Value consequent upon the change in interest rate.

Normally in coupon bonds, the interest rates and bond price move in opposite directions. This duration is well suited to measure a particular bond's volatility. There is an inverse relationship between modified duration and an approximate 1% (100 basis points) change in yield.

The formula for modified duration is as follows:

$$\text{Modified Duration} = \left[\frac{\text{Macaulay Duration}}{\left(1 + \frac{\text{YTM}}{n}\right)} \right]$$

6.32 Strategic Financial Management

Where

n = Number of compounding periods per year i.e. 2 for Semi-Annual and 4 for Quarter

YTM = Yield to Maturity

Illustration 5

The following data are available for a bond

Face value	₹1,000
Coupon Rate	16%
Years to Maturity	6
Redemption value	₹1,000
Yield to maturity	17%

Calculate the duration and volatility of this bond?

Solution

To calculate the duration first we shall calculate Market price of bond as follows:

$$160 (PVIFA 17\%,6) + 1,000 (PVIF 17\%,6)$$

$$= 160 (3.589) + 1,000 (0.390)$$

$$= 574.24 + 390$$

$$= 964.24$$

1. Duration

Year	Cash flow	P.V. @ 17%		Proportion of bond value	Proportion of bond value x time (years)
1	160	0.855	136.80	0.142	0.142
2	160	0.731	116.96	0.121	0.242
3	160	0.624	99.84	0.103	0.309
4	160	0.534	85.44	0.089	0.356
5	160	0.456	72.96	0.076	0.38
6	1160	0.390	452.40	0.469	2.814
			964.40	1.000	4.243

Duration of the Bond is 4.243 years

2. Volatility

$$\text{Volatility of the bonds} = \frac{\text{Duration}}{(1 + \text{YTM})} = \frac{4.243}{1.17} = 3.63\%$$

7

Portfolio Theory

Learning Objectives

After going through the chapter student shall be able to understand

- **Activities in Portfolio Management**
- **Objectives of Portfolio Management**
- **Phases of Portfolio Management**
 - (1) Security Analysis
 - (2) Portfolio Analysis
 - (3) Portfolio Selection
 - (4) Portfolio Revision
 - (5) Portfolio Evaluation
- **Portfolio Theories**
 - (1) Traditional Approach
 - (2) Modern Approach (Markowitz Model or Risk-Return Optimization)
- **Risk Analysis**
 - (1) Elements of Risk
 - (2) Diversion of Risk
 - (3) Risk & Return
 - (4) Portfolio Analysis
- **Markowitz Model of Risk-Return Optimization**
- **Capital Asset Pricing Model (CAPM)**
- **Arbitrage Pricing Theory Model (APT)**
- **Sharpe Index Model**
 - (1) Single Index Model
 - (2) Sharpe's Optimal Portfolio
- **Formulation of Portfolio Strategy**
 - (1) Active Portfolio Strategy (APS)

7.2 Strategic Financial Management

- (2) Passive Portfolio Strategy
- (3) Selection of Securities
- **Tax Efficient Strategies for Taxable Portfolios**
- **Asset Allocation Strategies**
- **Principles and Management of Hedge Funds**
- **International Portfolio Management**
- **Estimating the project discount rate**
- **Random Walk Theory**
- **Efficient Market Theory**

1. Introduction

Investment in the securities such as bonds, debentures and shares etc. is lucrative as well as exciting for the investors. Though investment in these securities may be rewarding, it is also fraught with risk. Therefore, investment in these securities requires a good amount of scientific and analytical skill. As per the famous principle of not putting all eggs in the same basket, an investor never invests his entire investable funds in one security. He invests in a well diversified portfolio of a number of securities which will optimize the overall risk-return profile. Investment in a portfolio can reduce risk without diluting the returns. An investor, who is expert in portfolio analysis, may be able to generate trading profits on a sustained basis.

Every investment is characterized by return and risk. The concept of risk is intuitively understood by investors. In general, it refers to the possibility of the rate of return from a security or a portfolio of securities deviating from the corresponding expected/average rate and can be measured by the standard deviation/variance of the rate of return.

1.1 Activities in Portfolio Management

The following three major activities are involved in the formation of an Optimal Portfolio suitable for any given investor:

- (a) Selection of securities.
- (b) Construction of all Feasible Portfolios with the help of the selected securities.
- (c) Deciding the weights/proportions of the different constituent securities in the portfolio so that it is an Optimal Portfolio for the concerned investor.

The activities are directed to achieve an Optimal Portfolio of investments commensurate with the risk appetite of the investor.

1.2 Objectives of Portfolio Management

Some of the important objectives of portfolio management are:

- (i) **Security/Safety of Principal:** Security not only involves keeping the principal sum intact but also its purchasing power.

- (ii) **Stability of Income:** To facilitate planning more accurately and systematically the reinvestment or consumption of income.
- (iii) **Capital Growth:** It can be attained by reinvesting in growth securities or through purchase of growth securities.
- (iv) **Marketability i.e. the ease with which a security can be bought or sold:** This is essential for providing flexibility to investment portfolio.
- (v) **Liquidity i.e. nearness to money:** It is desirable for the investor so as to take advantage of attractive opportunities upcoming in the market.
- (vi) **Diversification:** The basic objective of building a portfolio is to reduce the risk of loss of capital and/or income by investing in various types of securities and over a wide range of industries.
- (vii) **Favourable Tax Status:** The effective yield an investor gets from his investment depends on tax to which it is subjected to. By minimising the tax burden, yield can be effectively improved.

2. Phases of Portfolio Management

Portfolio management is a process and broadly it involves following five phases and each phase is an integral part of the whole process and the success of portfolio management depends upon the efficiency in carrying out each of these phases.

2.1 Security Analysis: The securities available to an investor for investment are numerous in number and of various types. The securities are normally classified on the basis of ownership of securities such as equity shares, preference shares, debentures and bonds. In recent times a number of new securities with innovative features are available in the market e.g. Convertible Debentures, Deep Discount Bonds, Zero Coupon Bonds, Flexi Bonds, Floating Rate Bonds, Global Depository Receipts, Euro-currency Bonds, Green Bonds, Pro Bonds, Masala Bonds etc. are some examples of these new securities. Among this vast group of securities, an investor has to choose those ones which he considers worthwhile to be included in his investment portfolio. This requires a detailed analysis of all the securities available for making investment.

Security analysis constitutes the initial phase of the portfolio formation process and consists of examining the risk-return characteristics of individual securities and also the correlation among them. A simple strategy in securities investment is to buy underpriced securities and sell overpriced securities. But the basic problem is how to identify underpriced and overpriced securities and this is what security analysis is all about.

As discussed in the chapter of Security Analysis, there are two alternative approaches to analyse any security viz. fundamental analysis and technical analysis. They are based on different premises and follow different techniques. Fundamental analysis, the older of the two approaches, concentrates on the fundamental factors affecting the company such as

- the EPS of the company,
- the dividend pay-out ratio,

7.4 Strategic Financial Management

- the competition faced by the company,
- the market share, quality of management, etc.
- fundamental factors affecting the industry to which the company belongs.

The fundamental analyst compares this intrinsic value (true worth of a security based on its fundamentals) with the current market price. If the current market price is higher than the intrinsic value, the share is said to be overpriced and vice versa. This mispricing of securities gives an opportunity to the investor to acquire the share or sell off the share profitably. An intelligent investor would buy those securities which are underpriced and sell those securities which are overpriced. Thus, it can be said that fundamental analysis helps to identify fundamentally strong companies whose shares are worthy to be included in the investor's portfolio.

The second approach to security analysis is 'Technical Analysis'. As per this approach, the share price movements are systematic and exhibit certain consistent patterns. Therefore, properly studied past movements in the prices of shares help to identify trends and patterns in security prices and efforts are made to predict the future price movements by looking at the patterns of the immediate past. Thus, technical analyst concentrates more on price movements and ignores the fundamentals of the shares.

In order to construct well diversified portfolios, so that Unsystematic Risk can be eliminated or substantially mitigated, an investor will like to select securities across diverse industry sectors which should not have strong positive correlation among themselves.

The efficient market hypothesis holds that share price movements are random and not systematic. Consequently, neither fundamental analysis nor technical analysis is of value in generating trading gains on a sustained basis. The EMH thus does not subscribe to the belief that it is possible to book gains in the long term on a sustained basis from trading in the stock market. Markets, though becoming increasingly efficient everywhere with the passage of time, are never perfectly efficient. So, there are opportunities all the time although their durations are decreasing and only the smart investors can look forward to booking gains consistently out of stock market deals.

2.2 Portfolio Analysis: Once the securities for investment have been identified, the next step is to combine these to form a suitable portfolio. Each such portfolio has its own specific risk and return characteristics which are not just the aggregates of the characteristics of the individual securities constituting it. The return and risk of each portfolio can be computed mathematically based on the risk-return profiles for the constituent securities and the pair-wise correlations among them.

From any chosen set of securities, an indefinitely large number of portfolios can be constructed by varying the fractions of the total investable resources allocated to each one of them. All such portfolios that can be constructed out of the set of chosen securities are termed as Feasible Portfolios.

2.3 Portfolio Selection: The goal of a rational investor is to identify the Efficient Portfolios out of the whole set of Feasible Portfolios mentioned above and then to zero in on

the Optimal Portfolio suiting his risk appetite. An Efficient Portfolio has the highest return among all Feasible Portfolios having identical Risk and has the lowest Risk among all Feasible Portfolios having identical Return. Harry Markowitz's portfolio theory (Modern Portfolio Theory) outlines the methodology for locating the Optimal Portfolio for an investor (unlike the CAPM, the Optimal Portfolio as per Markowitz Theory is investor specific).

2.4 Portfolio Revision: Once an optimal portfolio has been constructed, it becomes necessary for the investor to constantly monitor the portfolio to ensure that it does not lose its optimality. Since the economy and financial markets are dynamic in nature, changes take place in these variables almost on a daily basis and securities which were once attractive may cease to be so with the passage of time. New securities with expectations of high returns and low risk may emerge. In light of these developments in the market, the investor now has to revise his portfolio. This revision leads to addition (purchase) of some new securities and deletion (sale) of some of the existing securities from the portfolio. The nature of securities and their proportion in the portfolio changes as a result of the revision.

This portfolio revision may also be necessitated by some investor-related changes such as availability of additional funds for investment, change in risk appetite, need of cash for other alternative use, etc.

Portfolio revision is not a casual process to be taken lightly and needs to be carried out with care, scientifically and objectively so as to ensure the optimality of the revised portfolio. Hence, in the entire process of portfolio management, portfolio revision is as important as portfolio analysis and selection.

2.5 Portfolio Evaluation: This process is concerned with assessing the performance of the portfolio over a selected period of time in terms of return and risk and it involves quantitative measurement of actual return realized and the risk borne by the portfolio over the period of investment. The objective of constructing a portfolio and revising it periodically is to maintain its optimal risk return characteristics. Various types of alternative measures of performance evaluation have been developed for use by investors and portfolio managers.

This step provides a mechanism for identifying weaknesses in the investment process and for improving these deficient areas.

It should however be noted that the portfolio management process is an ongoing process. It starts with security analysis, proceeds to portfolio construction, and continues with portfolio - revision and ends with portfolio evaluation. Superior performance is achieved through continual refinement of portfolio management skill.

3. Portfolio Theories

Portfolio theory forms the basis for portfolio management. Portfolio management deals with the selection of securities and their continuous shifting in the portfolio to optimise returns to suit the objectives of an investor. This, however, requires financial expertise in selecting the right mix of securities in changing market conditions to get the best out of the stock market. In India as well as in a number of Western countries, portfolio management service has assumed the role of a specialised service and a number of professional investment bankers/fund

7.6 Strategic Financial Management

managers compete aggressively to provide the best options to high net-worth clients, who have little time to manage their own investments. The idea is catching on with the growth of the capital market and an increasing number of people want to earn profits by investing their hard-earned savings in a planned manner.

A portfolio theory guides investors about the method of selecting and combining securities that will provide the highest expected rate of return for any given degree of risk or that will expose the investor to the lowest degree of risk for a given expected rate of return. Portfolio theory can be discussed under the following heads:

3.1 Traditional Approach: The traditional approach to portfolio management concerns itself with the investor, definition of portfolio objectives, investment strategy, diversification and selection of individual investment as detailed below:

- (i) Investor's study includes an insight into his – (a) age, health, responsibilities, other assets, portfolio needs; (b) need for income, capital maintenance, liquidity; (c) attitude towards risk; and (d) taxation status;
- (ii) Portfolio objectives are defined with reference to maximising the investors' wealth which is subject to risk. The higher the level of risk borne, the more the expected returns.
- (iii) Investment strategy covers examining a number of aspects including:
 - (a) Balancing fixed interest securities against equities;
 - (b) Balancing high dividend payout companies against high earning growth companies as required by investor;
 - (c) Finding the income of the growth portfolio;
 - (d) Balancing income tax payable against capital gains tax;
 - (e) Balancing transaction cost against capital gains from rapid switching; and
 - (f) Retaining some liquidity to seize upon bargains.
- (iv) Diversification reduces volatility of returns and risks and thus adequate equity diversification is sought. Balancing of equities against fixed interest bearing securities is also sought.
- (v) Selection of individual investments is made on the basis of the following principles:
 - (a) Methods for selecting sound investments by calculating the true or intrinsic value of a share and comparing that value with the current market value (i.e. by following the fundamental analysis) or trying to predict future share prices from past price movements (i.e., following the technical analysis);
 - (b) Expert advice is sought besides study of published accounts to predict intrinsic value;
 - (c) Inside information is sought and relied upon to move to diversified growth companies, switch quickly to winners than loser companies;
 - (d) Newspaper tipsters about good track record of companies are followed closely;

- (e) Companies with good asset backing, dividend growth, good earning record, high quality management with appropriate dividend paying policies and leverage policies are traced out constantly for making selection of portfolio holdings.

In India, most of the share and stock brokers follow the above traditional approach for selecting a portfolio for their clients.

3.2 Modern Approach (Markowitz Model or Risk-Return Optimization): Originally developed by Harry Markowitz in the early 1950's, Portfolio Theory - sometimes referred to as Modern Portfolio Theory - provides a logical/mathematical framework in which investors can optimize their risk and return. The central plank of the theory is that diversification through portfolio formation can reduce risk, and return is a function of expected risk.

Harry Markowitz is regarded as the father of Modern Portfolio Theory. According to him, investors are mainly concerned with two properties of an asset: risk and return. The essence matters is the contribution it makes to the investor's overall risk. By turning his principle into a useful technique for selecting the right portfolio from a range of different assets, he developed the 'Mean Variance Analysis' in 1952.

We shall discuss this theory in greater detail later in this chapter.

4. Risk Analysis

Before proceeding further it will be better if the concept of risk and return is discussed. A person makes an investment in the expectation of getting some return in the future. But, the future is uncertain and so is the future expected return. It is this uncertainty associated with the returns from an investment that introduces risk for an investor.

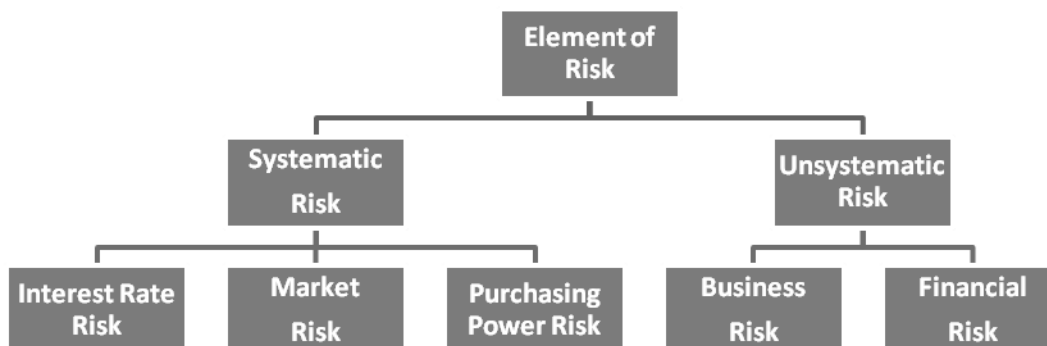
It is important here to distinguish between the expected return and the realized return from an investment. The expected future return is what an investor expects to get from his investment and is uncertain. On the other hand, the realized return is what an investor actually obtains from his investment at the end of the investment period. The investor makes the investment decision based on the expected return from the investment. However, the actual return realized from the investment may not correspond to the expected return. This possible variation of the actual return from the expected return is termed as risk. If actual realizations correspond to expectations exactly, there would be no risk. Risk arises where there is a possibility of variation between expectations and realizations with regard to an investment.

Thus, risk arises from the variability in returns. An investment whose returns are fairly stable is considered to be a low-risk investment, whereas an investment whose returns fluctuate significantly is considered to be a highly risky investment. Government securities whose returns are fairly stable and which are free from default are considered to possess low risk whereas equity shares whose returns are likely to fluctuate widely around their mean are considered risky investments.

The essence of risk in an investment is the variation in its returns. This variation in returns is caused by a number of factors. These factors which produce variations in the returns from an investment constitute the elements of risk.

7.8 Strategic Financial Management

4.1 Elements of Risk: Let us consider the risk in holding securities, such as shares, debentures, etc. The elements of risk may be broadly classified into two groups as shown in the following diagram.



The first group i.e. systematic risk comprises factors that are external to a company (macro in nature) and affect a large number of securities simultaneously. These are mostly uncontrollable in nature. The second group i.e. unsystematic risk includes those factors which are internal to companies (micro in nature) and affect only those particular companies. These are controllable to a great extent.

The total variability in returns of a security is due to the total risk of that security. Hence,

Total risk = Systematic risk + Unsystematic risk

4.1.1 Systematic Risk: Due to dynamic nature of society, the changes occur in the economic, political and social systems constantly. These changes have an influence on the performance of companies and thereby on their stock prices but in varying degrees. For example, economic and political instability adversely affects all industries and companies. When an economy moves into recession, corporate profits will shift downwards and stock prices of most companies may decline. Thus, the impact of economic, political and social changes is system-wide and that portion of total variability in security returns caused by such system-wide factors is referred to as systematic risk. Systematic risk can be further subdivided into interest rate risk, market risk and purchasing power risk.

(i) Interest Rate Risk: This arises due to variability in the interest rates from time to time and particularly affects debts securities like bonds and debentures as they carry fixed coupon rate of interest. A change in the interest rates establishes an inverse relationship in the price of security i.e. price of securities tends to move inversely with change in rate of interest, long term securities show greater variability in the price with respect to interest rate changes than short term securities. While cash equivalents are less vulnerable to interest rate risk the long term bonds are more vulnerable to interest rate risk.

(ii) Purchasing Power Risk: It is also known as inflation risk, as it also emanates from the very fact that inflation affects the purchasing power adversely. Nominal return contains both the real return component and an inflation premium in a transaction involving risk of the above

type to compensate for inflation over an investment holding period. Inflation rates vary over time and investors are caught unaware when rate of inflation changes unexpectedly causing erosion in the value of realised rate of return and expected return.

Purchasing power risk is more in inflationary conditions especially in respect of bonds and fixed income securities. It is not desirable to invest in such securities during inflationary periods. Purchasing power risk is however, less in flexible income securities like equity shares or common stock where rise in dividend income off-sets increase in the rate of inflation and provides advantage of capital gains.

(iii) Market risk: This is a type of systematic risk that affects prices of any particular share move up or down consistently for some time periods in line with other shares in the market. A general rise in share prices is referred to as a bullish trend, whereas a general fall in share prices is referred to as a bearish trend. In other words, the share market moves between the bullish phase and the bearish phase. The market movements can be easily seen in the movement of share price indices such as the BSE Sensitive Index, BSE National Index, NSE Index etc.

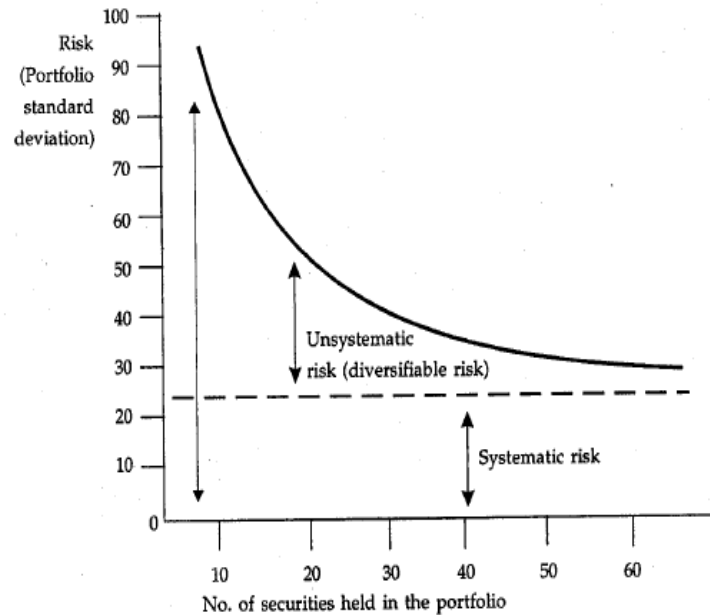
4.1.2 Unsystematic Risk: Sometimes the return from a security of any company may vary because of certain factors particular to this company. Variability in returns of the security on account of these factors (micro in nature), it is known as unsystematic risk. It should be noted that this risk is in addition to the systematic risk affecting all the companies. Unsystematic risk can be further subdivided into business risk and financial risk.

(i) Business Risk: Business risk emanates from sale and purchase of securities affected by business cycles, technological changes etc. Business cycles affect all types of securities viz. there is cheerful movement in boom due to bullish trend in stock prices whereas bearish trend in depression brings down fall in the prices of all types of securities. Flexible income securities are more affected than fixed rate securities during depression due to decline in their market price.

(ii) Financial Risk: It arises due to changes in the capital structure of the company. It is also known as leveraged risk and expressed in terms of debt-equity ratio. Excess of debt vis-à-vis equity in the capital structure indicates that the company is highly geared. Although a leveraged company's earnings per share are more but dependence on borrowings exposes it to the risk of winding-up for its inability to honour its commitments towards lenders/creditors. This risk is known as leveraged or financial risk of which investors should be aware of and portfolio managers should be very careful.

4.2 Diversion of Risk: As discussed above the total risk of an individual security consists of two risks systematic risk and unsystematic risk. It should be noted that by combining many securities in a portfolio the unsystematic risk can be avoided or cancelled out which is attached to any particular security. The following diagram depicts how the risk can be reduced with the increase in the number of securities.

7.10 Strategic Financial Management



From the above diagram it can be seen that total risk is reducing with the increase in the number of securities in the portfolio. However, ultimately when the size of the portfolio reaches certain limit, it will contain only the systematic risk of securities included in the portfolio.

4.3 Risk & Return: It is very common that an intelligent investor would attempt to anticipate the kind of risk that he/she is likely to face and would also attempt to estimate the extent of risk associated with different investment proposals. In other words an attempt is made by him/her to measure or quantify the risk of each investment under consideration before making the final selection. Thus quantification of risk is necessary for analysis of any investment.

As risk is attached with return its risk cannot be measured without reference to return. The return, in turn, depends on the cash inflows to be received from the investment. Let us take an example of purchase of a share. With an investment in an equity share, an investor expects to receive future dividends declared by the company. In addition, he expects to receive capital gain in the form of difference between the selling price and purchase price, when the share is finally sold.

Suppose a share of X Ltd. is currently selling at ₹ 12.00. An investor who is interested in the share anticipates that the company will pay a dividend of ₹ 0.50 in the next year. Moreover, he expects to sell the share at ₹ 17.50 after one year. The expected return from the investment in share will be as follows:

$$R = \frac{\text{Forecasted dividend} + \text{Forecasted end of the period stock price}}{\text{Initial investment}} - 1$$

$$R = \frac{\text{₹ } 0.50 + \text{₹ } 17.50}{\text{₹ } 12.00} - 1 = 0.5 \text{ or } 50 \text{ per cent}$$

It is important to note that here the investor expects to get a return of 50 per cent in the future, which is uncertain. It might be possible that the dividend declared by the company may turn out to be either more or less than the figure anticipated by the investor. Similarly, the selling price of the share may be less than the price expected by the investor at the time of investment. It may sometimes be even more. Hence, there is a possibility that the future return may be more than 50 per cent or less than 50 per cent. Since the future is uncertain the investor has to consider the probability of several other possible returns. The expected returns may be 20 per cent, 30 per cent, 50 per cent, 60 per cent or 70 per cent. The investor now has to assign the probability of occurrence of these possible alternative returns as given below:

Possible returns (in per cent) X_i	Probability of occurrence $p(X_i)$
20	0.20
30	0.20
50	0.40
60	0.10
70	0.10

The above table gives the probability distribution of possible returns from an investment in shares. Such distribution can be developed by the investor with the help of analysis of past data and modifying it appropriately for the changes he expects to occur in a future period of time.

With the help of available probability distribution two statistical measures one expected return and the other risk of the investment can be calculated.

4.3.1 Expected Return: The expected return of the investment is the probability weighted average of all the possible returns. If the possible returns are denoted by X_i and the related probabilities are $p(X_i)$ the expected return may be represented as \bar{X} and can be calculated as:

$$\bar{X} = \sum_{i=1}^n x_i p(X_i)$$

It is the sum of the products of possible returns with their respective probabilities.

The expected return of the share in the example given above can be calculated as shown below:

Calculation of Expected Return

Possible returns(%) X_i	Probability $p(X_i)$	$X_i p(X_i)$
20	0.20	4.00
30	0.20	6.00
40	0.40	16.00

7.12 Strategic Financial Management

50	0.10	5.00
60	0.10	6.00
$\sum_{i=1}^n x_i p(X_i)$		37.00

Hence the expected return is 37 per cent

4.3.2 Risk: As risk is attached with every return hence calculation of only expected return is not sufficient for decision making. Therefore risk aspect should also be considered along with the expected return. The most popular measure of risk is the variance or standard deviation of the probability distribution of possible returns.

Variance is generally denoted by σ^2 and is calculated by using the following formula:

$$\sum_{i=1}^n [(X_i - \bar{X})^2 p(X_i)]$$

Continuing our earlier example the following table provides calculations required to calculate the risk i.e. Variance or Standard Deviation (SD).

Possible returns X_i (%)	Probability $p(X_i)$	Deviation $(X_i - \bar{X})$	Deviation squared $(X_i - \bar{X})^2$	Product $(X_i - \bar{X})^2 p(X_i)$
20	0.20	-17.00	289.00	57.80
30	0.20	-7.00	49.00	9.80
40	0.40	3.00	9.00	3.60
50	0.10	13.00	169.00	16.90
60	0.10	23.00	529.00	52.90
Var (σ^2)				141.00

Variance = 141 per cent

Standard Deviation of the return will be the positive square root of the variance and is generally represented by σ . Accordingly, the standard deviation of return in the above example will be $\sqrt{141} = 11.87\%$.

The basic purpose to calculate the variance and standard deviation is to measure the extent of variability of possible returns from the expected return. Several other measures such as range, semi-variance and mean absolute deviation can also be used to measure risk, but standard deviation has been the most popularly accepted measure.

The method described above is widely used for assessing risk and is also known as the mean variance approach.

The standard deviation or variance, however, provides a measure of the total risk associated with a security. As we know, the total risk comprises two components, namely systematic risk and unsystematic risk. Unsystematic risk is the risk specific or unique to a company.

Unsystematic risk associated with the security of a particular company can be eliminated/reduced by combining it with another security having negative correlation. This process is known as diversification of unsystematic risk. As a means of diversification the investment is spread over a group of securities with different characteristics. This collection of diverse securities is called a portfolio.

As unsystematic risk can be reduced or eliminated through diversification, it is not very important for an investor to consider. The risk that is relevant in investment decisions is the systematic risk because it is not diversifiable. Hence, the main interest of the investor lies in the measurement of systematic risk of a security.

4.3.3 Measurement of Systematic Risk: As discussed earlier, systematic risk is the variability in security returns caused by changes in the economy or the market and all securities are affected by such changes to some extent. Some securities exhibit greater variability in response to market changes and some may exhibit less response. Securities that are more sensitive to changes in factors are said to have higher systematic risk. The average effect of a change in the economy can be represented by the change in the stock market index. The systematic risk of a security can be measured by relating that security's variability vis-à-vis variability in the stock market index. A higher variability would indicate higher systematic risk and vice versa.

The systematic risk of a security is measured by a statistical measure which is called Beta. The main input data required for the calculation of beta of any security are the historical data of returns of the individual security and corresponding return of a representative market return (stock market index). There are two statistical methods i.e. correlation method and the regression method, which can be used for the calculation of Beta.

4.3.3.1 Correlation Method: Using this method beta (β) can be calculated from the historical data of returns by the following formula:

$$\beta_i = \frac{r_{im}\sigma_i\sigma_m}{\sigma_m^2}$$

Where

r_{im} = Correlation coefficient between the returns of the stock i and the returns of the market index.

σ_i = Standard deviation of returns of stock i

σ_m = Standard deviation of returns of the market index.

σ_m^2 = Variance of the market returns

4.3.3.2 Regression Method: The regression model is based on the postulation that there exists a linear relationship between a dependent variable and an independent variable. The model helps to calculate the values of two constants, namely alfa (α) and beta (β). β measures the change in the dependent variable in response to unit change in the independent variable,

7.14 Strategic Financial Management

while α measures the value of the dependent variable even when the independent variable has zero value. The formula of the regression equation is as follows:

$$Y = \alpha + \beta X$$

where

Y = Dependent variable

X = Independent variable

α and β are constants.

$$\alpha = Y - \beta X$$

The formula used for the calculation of α and β are given below.

$$\beta = \frac{n \sum XY - (\sum X)(\sum Y)}{n \sum X^2 - (\sum X)^2}$$

where

n = Number of items.

Y = Dependent variable scores.

X = Independent variable scores.

For the purpose of calculation of β , the return of the individual security is taken as the dependent variable and the return of the market index is taken as the independent variable. The regression equation is represented as follows:

$$R_i = \alpha + \beta_i R_m$$

where

R_i = Return of the individual security.

R_m = Return of the market index.

α = Estimated return of the security when the market is stationary.

β_i = Change in the return of the individual security in response to unit change in the return of the market index. It is, thus, the measure of systematic risk of a security.

Here it is very important to note that a security can have betas that are positive, negative or zero.

- Positive Beta- indicates that security's return is dependent on the market return and moves in the direction in which market moves.
- Negative Beta- indicates that security's return is dependent on the market return but moves in the opposite direction in which market moves.
- Zero Beta- indicates that security's return is independent of the market return.

Further as beta measures the volatility of a security's returns relative to the market, the larger the beta, the more volatile the security. A beta of 1.0 indicates a security of average risk. A

stock with beta greater than 1.0 has above average risk i.e. its returns would be more volatile than the market returns. For example, when market returns move up by 6%, a stock with beta of 2 would find its returns moving up by 12% (i.e. 6% x 2). Similarly, decline in market returns by 6% would produce a decline of 12% (i.e. 6% x 2) in the return of that security.

A stock with beta less than 1.0 would have below average risk. Variability in its returns would be less than the market variability.

Beta is calculated from historical data of returns to measure the systematic risk of a security. It is a historical measure of systematic risk. In using this beta for investment decision making, the investor is assuming that the relationship between the security variability and market variability will continue to remain the same in future also.

4.4 Portfolio Analysis

Till now we have discussed the risk and return of a single security. Let us now discuss the return and risk of a portfolio of securities.

4.4.1 Portfolio Return: For a portfolio analysis an investor first needs to specify the list of securities eligible for selection or inclusion in the portfolio. Then he has to generate the risk-return expectations for these securities. The expected return for the portfolio is expressed as the mean of its rates of return over the time horizon under consideration and risk for the portfolio is the variance or standard deviation of these rates of return around the mean return.

The expected return of a portfolio of assets is simply the weighted average of the returns of the individual securities constituting the portfolio. The weights to be applied for calculation of the portfolio return are the fractions of the portfolio invested in such securities.

Let us consider a portfolio of two equity shares A and B with expected returns of 16 per cent and 22 per cent respectively.

The formula for the calculation of expected portfolio return may be expressed as shown below:

$$\bar{r}_p = \sum_{i=1}^n X_i \bar{r}_i$$

\bar{r}_p = Expected return of the portfolio.

X_i = Proportion of funds invested in security

\bar{r}_i = Expected return of security i.

n = Number of securities in the portfolio.

If 40 per cent of the total funds is invested in share A and the remaining 60 per cent in share B, then the expected portfolio return will be:

$$(0.40 \times 16) + (0.60 \times 22) = 19.6 \text{ per cent}$$

4.4.2 Portfolio Risk: As discussed earlier, the variance of return and standard deviation of return are statistical measures that are used for measuring risk in investment. The variance of a portfolio can be written down as the sum of 2 terms, one containing the aggregate of the

7.16 Strategic Financial Management

weighted variances of the constituent securities and the other containing the weighted covariances among different pairs of securities.

Covariance (a statistical measure) between two securities or two portfolios or a security and a portfolio indicates how the rates of return for the two concerned entities behave relative to each other.

The covariance between two securities A and B may be calculated using the following formula:

$$COV_{AB} = \frac{\sum [R_A - \bar{R}_A][R_B - \bar{R}_B]}{N}$$
 At the beginning please add the summation sign in the numerator

where

COV_{AB} = Covariance between x and y.

R_A = Return of security x.

R_B = Return of security y.

\bar{R}_A = Expected or mean return of security x.

\bar{R}_B = Expected or mean return of security y.

N = Number of observations.

The calculation of covariance can be understood with the help of following table:

Calculation of Covariance

Year	R_x	Deviation $R_x - \bar{R}_x$	R_y	Deviation $R_y - \bar{R}_y$	$[R_x - \bar{R}_x][R_y - \bar{R}_y]$
1	11	-4	18	5	-20
2	13	-2	14	1	-2
3	17	2	11	-2	-4
4	19	4	9	-4	-16
	$\bar{R}_x = 15$		$\bar{R}_y = 13$		-42

$$Cov_{xy} = \frac{\sum_{i=1}^n [R_x - \bar{R}_x][R_y - \bar{R}_y]}{n} = \frac{-42}{4} = -10.5$$

From the above table it can be seen that the covariance is a measure of how returns of two securities move together. In case the returns of the two securities move in the same direction consistently the covariance is said to be positive (+). Contrarily, if the returns of the two securities move in opposite directions consistently the covariance would be negative (-). If the movements of returns are independent of each other, covariance would be close to zero (0).

The coefficient of correlation is expressed as:

$$r_{AB} = \frac{\text{Cov}_{AB}}{\sigma_A \sigma_B}$$

where

r_{AB} = Coefficient of correlation between x and y.

Cov_{AB} = Covariance between A and B.

σ_A = Standard deviation of A.

σ_B = Standard deviation of B.

It may be noted on the basis of above formula the covariance can be expressed as the product of correlation between the securities and the standard deviation of each of the securities as shown below:

$$\text{Cov}_{AB} = \sigma_A \sigma_B r_{AB}$$

It is very important to note that the correlation coefficients may range from -1 to 1. A value of -1 indicates perfect negative correlation between the two securities' returns, while a value of +1 indicates a perfect positive correlation between them. A value of zero indicates that the returns are independent.

The calculation of the variance (or risk) of a portfolio is not simply a weighted average of the variances of the individual securities in the portfolio as in the calculation of the return of portfolio. The variance of a portfolio with only two securities in it can be calculated with the following formula.

$$\sigma_p^2 = x_1^2 \sigma_1^2 + x_2^2 \sigma_2^2 + 2x_1 x_2 (r_{12} \sigma_1 \sigma_2)$$

where

σ_p^2 = Portfolio variance.

x_1 = Proportion of funds invested in the first security.

x_2 = Proportion of funds invested in the second security ($x_1 + x_2 = 1$).

σ_1^2 = Variance of first security.

σ_2^2 = Variance of second security.

σ_1 = Standard deviation of first security.

σ_2 = Standard deviation of second security.

r_{12} = Correlation coefficient between the returns of the first and second securities.

As the standard deviation is the square root of the variance the portfolio standard deviation can be obtained by taking the square root of portfolio variance.

Let us take an example to understand the calculation of portfolio variance and portfolio standard deviation. Two securities A and B generate the following sets of expected returns, standard deviations and correlation coefficient:

7.18 Strategic Financial Management

	A	B
$\bar{r} =$	20%	25%
$\sigma =$	50%	30%
$r_{ab} =$		-0.60

Now suppose a portfolio is constructed with 40 per cent of funds invested in A and the remaining 60 per cent of funds in B (i.e. $P = 0.4A + 0.6B$).

Using the formula of portfolio return the expected return of the portfolio will be:

$$R_p = (0.40 \times 20) + (0.60 \times 25) = 23\%$$

And the Variance and Standard Deviation of the portfolio will be:

Variance

$$\sigma_p^2 = (0.40)^2 (50)^2 + (0.60)^2 (30)^2 + 2(0.40)(0.60)(-0.60)(50)(30) = 400 + 324 - 432 = 292$$

Standard deviation

$$\sigma_p = \sqrt{292} = 17.09 \text{ per cent.}$$

The return and risk of a portfolio depends on following two sets of factors:

- Returns and risks of individual securities and the covariance between securities forming the portfolio
- Proportion of investment in each of securities.

As the first set of factors is parametric in nature for the investor in the sense that he has no control over the returns, risks and co-variances of individual securities. The second set of factors is choice factor or variable for the investors in the sense that they can choose the proportions of each security in the portfolio.

4.4.3 Reduction or dilution of Portfolio Risk through Diversification: The process of combining more than one security in to a portfolio is known as diversification. The main purpose of this diversification is to reduce the total risk by eliminating or substantially mitigating the unsystematic risk, without sacrificing portfolio return. As shown in the example mentioned above, diversification has helped to reduce risk. The portfolio standard deviation of 17.09 is lower than the standard deviation of either of the two securities taken separately which were 50 and 30 respectively. Incidentally, such risk reduction is possible even when the two constituent securities are uncorrelated. In case, however, these have the maximum positive correlation between them, no reduction of risk can be achieved.

In order to understand the mechanism and power of diversification, it is necessary to consider the impact of covariance or correlation on portfolio risk more closely. We shall discuss following three cases taking two securities in the portfolio:

- Securities' returns are perfectly positively correlated,
- Securities' returns are perfectly negatively correlated, and

(c) Securities' returns are not correlated i.e. they are independent.

4.4.3.1 Perfectly Positively Correlated: In case two securities returns are perfectly positively correlated the correlation coefficient between these securities will be +1 and the returns of these securities then move up or down together.

The variance of such portfolio can be calculated by using the following formula:

$$\sigma_p^2 = x_1^2 \sigma_1^2 + x_2^2 \sigma_2^2 + 2x_1 x_2 r_{12} \sigma_1 \sigma_2$$

As $r_{12} = 1$, this may be rewritten as:

$$\sigma_p^2 = x_1^2 \sigma_1^2 + x_2^2 \sigma_2^2 + 2x_1 x_2 \sigma_1 \sigma_2$$

or

$$\sigma_p^2 = (x_1 \sigma_1 + x_2 \sigma_2)^2$$

Hence Standard Deviation will become

$$\sigma_p = x_1 \sigma_1 + x_2 \sigma_2$$

In other words this is simply the weighted average of the standard deviations of the individual securities.

Taking the above example we shall now calculate the portfolio standard deviation when correlation coefficient is +1.

Standard deviation of security A = 40

Standard deviation of security B = 25

Proportion of investment in A = 0.4

Proportion of investment in B = 0.6

Correlation coefficient = +1.0

Portfolio standard deviation maybe calculated as:

$$\sigma_p = (0.4)(40) + (0.6)(25) = 31$$

Thus it can be seen that the portfolio standard deviation will lie between the standard deviations of the two individual securities. It will vary between 40 and 25 as the proportion of investment in each security changes.

Now suppose, if the proportion of investment in A and B are changed to 0.75 and 0.25 respectively; portfolio standard deviation of the portfolio will become:

$$\sigma_p = (0.75)(40) + (0.25)(25) = 36.25$$

It is important to note that when the security returns are perfectly positively correlated, diversification provides only risk averaging and no risk reduction because the portfolio risk cannot be reduced below the individual security risk. Hence, reduction of risk is not achieved when the constituent securities' returns are perfectly positively correlated.

7.20 Strategic Financial Management

4.4.3.2 Perfectly Negatively Correlated: When two securities' returns are perfectly negatively correlated, two returns always move in exactly opposite directions and correlation coefficient between them becomes -1. The variance of such negatively correlated portfolio may be calculated as:

$$\sigma_p^2 = x_1^2\sigma_1^2 + x_2^2\sigma_2^2 - 2x_1x_2(r_{12}\sigma_1\sigma_2)$$

As $r_{12} = -1$, this may be rewritten as:

$$\sigma_p^2 = (x_1\sigma_1 - x_2\sigma_2)^2$$

Hence Standard Deviation will become

$$\sigma_p = x_1\sigma_1 - x_2\sigma_2$$

Taking the above example, we shall now calculate the portfolio standard deviation when correlation coefficient is -1.

$$\sigma_p = (0.4)(40) - (0.6)(25) = 1$$

Thus, from above it can be seen that the portfolio risk has become very low in comparison of risk of individual securities. By changing the weights it can even be reduced to zero. For example, if the proportion of investment in A and B are 0.3846 and 0.6154 respectively, portfolio standard deviation becomes:

$$= (0.3846)(40) - (0.6154)(25) = 0$$

Although in above example the portfolio contains two risky assets, the portfolio has no risk at all. Thus, the portfolio may become entirely risk-free when security returns are perfectly negatively correlated. Therefore, diversification can substantially reduce or even eliminate risk when securities are perfectly negatively correlated. However, in real life it is very rare to find securities that are perfectly negatively correlated.

4.4.3.3 Returns are uncorrelated or independent: When the returns of two securities are entirely uncorrelated, the coefficient of correlation of these two securities would be zero and the formula for portfolio variance will be as follows:

$$\sigma_p^2 = x_1^2\sigma_1^2 + x_2^2\sigma_2^2 + 2x_1x_2r_{12}\sigma_1\sigma_2$$

As $r_{12} = 0$, this may be rewritten as:

$$\sigma_p^2 = x_1^2\sigma_1^2 + x_2^2\sigma_2^2$$

Hence Standard Deviation will become

$$\sigma_p = \sqrt{x_1^2\sigma_1^2 + x_2^2\sigma_2^2}$$

Taking the above example, we shall now calculate the portfolio standard deviation when correlation coefficient is 0.

$$\sigma_p = \sqrt{(0.4)^2 (40)^2 + (0.6)^2 (25)^2}$$

$$\sigma_p = \sqrt{256 + 225}$$

$$\sigma_p = 21.93$$

Thus it can be observed that the portfolio standard deviation is less than the standard deviations of individual securities in the portfolio. Therefore, when security returns are uncorrelated, diversification can reduce risk .

We may now tabulate the portfolio standard deviations of our illustrative portfolio having two securities A and B, for different values of correlation coefficients between them. The proportion of investments in A and B are 0.4 and 0.6 respectively. The individual standard deviations of A and B are 40 and 25 respectively.

Portfolio Standard Deviations

Correlation coefficient	Portfolio Standard Deviation
1.00	31
0.60	27.73
0	21.93
-0.60	13.89
-1.00	1.00

Summarily it can be concluded that diversification reduces risk in all cases except when the security returns are perfectly positively correlated. With the decline of correlation coefficient from +1 to -1, the portfolio standard deviation also declines. But the risk reduction is greater when the security returns are negatively correlated.

4.4.4 Portfolio with more than two securities: So far we have considered a portfolio with only two securities. The benefits from diversification increase as more and more securities with less than perfectly positively correlated returns are included in the portfolio. As the number of securities added to a portfolio increases, the standard deviation of the portfolio becomes smaller and smaller. Hence, an investor can make the portfolio risk arbitrarily small by including a large number of securities with negative or zero correlation in the portfolio.

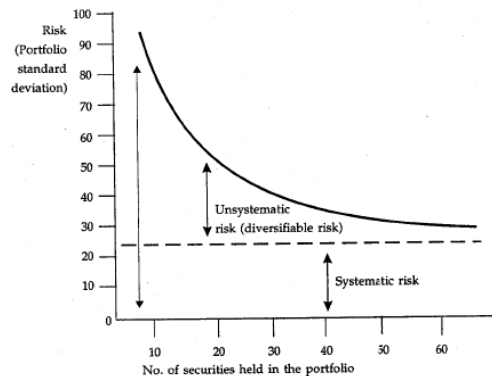
But, in reality, no securities show negative or even zero correlation. Typically, securities show some positive correlation, that is above zero but less than the perfectly positive value (+1). As a result, diversification (that is, adding securities to a portfolio) results in some reduction in total portfolio risk but not in complete elimination of risk. Moreover, the effects of diversification are exhausted fairly rapidly. That is, *most* of the reduction in portfolio standard deviation occurs by the time the portfolio size increases to 25 or 30 securities. Adding securities beyond this size brings about only marginal reduction in portfolio standard deviation.

Adding securities to a portfolio reduces risk because securities are not perfectly positively correlated. But the effects of diversification are exhausted rapidly because the securities are

7.22 Strategic Financial Management

still positively correlated to each other though not perfectly correlated. Had they been negatively correlated, the portfolio risk would have continued to decline as portfolio size increased. Thus, in practice, the benefits of diversification are limited.

The total risk of an individual security comprises two components, the market related risk called systematic risk and the unique risk of that particular security called unsystematic risk. By combining securities into a portfolio the unsystematic risk specific to different securities is cancelled out. Consequently, the risk of the portfolio as a whole is reduced as the size of the portfolio increases. Ultimately when the size of the portfolio reaches a certain limit, it will contain only the systematic risk of securities included in the portfolio. The systematic risk, however, cannot be eliminated. Thus, a fairly large portfolio has only systematic risk and has relatively little unsystematic risk. That is why there is no gain in adding securities to a portfolio beyond a certain portfolio size. Following figure depicts the diversification of risk in a portfolio.



The figure shows the portfolio risk declining as the number of securities in the portfolio increases, but the risk reduction ceases when the unsystematic risk is eliminated.

4.4.5 Calculation of Return and Risk of Portfolio with more than two securities: The expected return of a portfolio is the weighted average of the returns of individual securities in the portfolio, the weights being the proportion of investment in each security. The formula for calculation of expected portfolio return is the same for a portfolio with two securities and for portfolios with more than two securities. The formula is:

$$\bar{r}_p = \sum_{i=1}^n x_i \bar{r}_i$$

Where

\bar{r}_p = Expected return of portfolio.

x_i = Proportion of funds invested in each security.

\bar{r}_i = Expected return of each security.

n = Number of securities in the portfolio.

Let us consider a portfolio with four securities having the following characteristics:

Security	Returns (per cent)	Proportion of investment
P	11	0.3
Q	16	0.2
R	22	0.1
S	20	0.4

The expected return of this portfolio may be calculated using the formula:

$$\begin{aligned} \bar{r}_p &= (0.3)(11) + (0.2)(16) + (0.1)(22) + (0.4)(20) \\ &= 16.7 \text{ per cent} \end{aligned}$$

The portfolio variance and standard deviation depend on the proportion of investment in each security as also the variance and covariance of each security included in the portfolio.

The formula for portfolio variance of a portfolio with more than two securities is as follows:

$$\sigma_p^2 = \sum_{i=1}^n \sum_{j=1}^n x_i x_j \sigma_{ij}$$

where

σ_p^2 = Portfolio variance.

x_i = Proportion of funds invested in security i (the first of a pair of securities).

x_j = Proportion of funds invested in security j (the second of a pair of securities).

σ_{ij} = The covariance between the pair of securities i and j

n = Total number of securities in the portfolio.

or

$$\sigma_p^2 = \sum_{i=1}^n \sum_{j=1}^n x_i x_j \sigma_i \sigma_j r_{ij}$$

where

σ_p^2 = Portfolio variance.

σ_i = Standard Deviation of security i

σ_j = Standard Deviation of security j

r_{ij} = The co-efficient of correlation between the pair of securities i and j

Let us take the following example to understand how we can compute the risk of multiple asset portfolio.

7.24 Strategic Financial Management

Security	x_i	σ_i	Correlation Coefficient
X	0.25	16	X and Y = 0.7
Y	0.35	7	X and Z = 0.3
Z	0.40	9	Y and Z = 0.4

It may be noted that correlation coefficient between X and X, Y and Y, Z and Z is 1.

A convenient way to obtain the result is to set up the data required for calculation in the form of a variance-covariance matrix.

As per data given in the example, the first cell in the first row of the matrix represents X and X the second cell in the first row represents securities X and Y, and so on. The variance or covariance in each cell has to be multiplied by the weights of the respective securities represented by that cell. These weights are available in the matrix at the left side of the row and the top of the column containing the cell.

This process may be started from the first cell in the first row and continued for all the cells till the last cell of the last row is reached as shown below:

Weights ↓	→			
		0.25	0.35	0.40
		X	Y	Z
0.25	X	1 x 16 x 16	0.7 x 16 x 7	0.3 x 16 x 9
0.35	Y	0.7 x 7 x 16	1 x 7 x 7	0.4 x 7 x 9
0.40	Z	0.3 x 9 x 16	0.4 x 9 x 7	1 x 9 x 9

Once the variance-covariance matrix is set up, the computation of portfolio variance is a comparatively simple operation. Each cell in the matrix represents a pair of two securities.

When all these products are summed up, the resulting figure is the portfolio variance. The square root of this figure gives the portfolio standard deviation.

Thus the variance of the portfolio given in the example above can now be calculated.

$$\begin{aligned}\sigma_p^2 &= (0.25 \times 0.25 \times 1 \times 16 \times 16) + (0.25 \times 0.35 \times 0.7 \times 16 \times 7) + (0.25 \times 0.40 \times 0.3 \times 16 \times 9) + \\ &\quad (0.35 \times 0.25 \times 0.7 \times 7 \times 16) + (0.35 \times 0.35 \times 1 \times 7 \times 7) + (0.35 \times 0.40 \times 0.4 \times 7 \times 9) + \\ &\quad (0.40 \times 0.25 \times 0.3 \times 9 \times 16) + (0.40 \times 0.35 \times 0.4 \times 9 \times 7) + (0.40 \times 0.40 \times 1 \times 9 \times 9) \\ &= 16+6.86+4.32+6.86+6.0025+3.528+4.32+3.528+12.96 = 64.3785\end{aligned}$$

The portfolio standard deviation is:

$$\sigma_p = \sqrt{64.3785} = 8.0236$$

Hence, the formula for computing portfolio variance may also be stated as follows:

$$\sigma_p^2 = \sum_{i=1}^n \sum_{j=1}^n x_i x_j r_{ij} \sigma_i \sigma_j$$

Thus, from above discussion it can be said that a portfolio is a combination of assets. From a given set of 'n' securities, any number of portfolios can be created. These portfolios may comprise of two securities, three securities, all the way up to 'n' securities. A portfolio may contain the same securities as another portfolio but with different weights. A new portfolios can be created either by changing the securities in the portfolio or by changing the proportion of investment in the existing securities.

Thus, summarily it can be concluded that each portfolio is characterized by its expected return and risk. Determination of expected return and risk (variance or standard deviation) of each portfolio can be used to create a set of selected securities which is the first step in portfolio management and called portfolio analysis.

5. Markowitz Model of Risk-return Optimization

The portfolio selection problem can be divided into two stages, (1) finding the mean-variance efficient portfolios and (2) selecting one such portfolio. Investors do not like risk and the greater the riskiness of returns on an investment, the greater will be the returns expected by investors. There is a tradeoff between risk and return which must be reflected in the required rates of return on investment opportunities. The standard deviation (or variance) of return measures the total risk of an investment. It is not necessary for an investor to accept the total risk of an individual security. Investors can and do diversify to reduce risk. As number of holdings approach larger, a good deal of total risk is removed by diversification.

5.1 Assumptions of the Model

It is a common phenomenon that the diversification of investments in the portfolio leads to reduction in variance of the return, even for the same level of expected return. This model has taken into account risks associated with investments - using variance or standard deviation of the return. This model is based on the following assumptions. :

- (i) The return on an investment adequately summarises the outcome of the investment.
- (ii) The investors can visualise a probability distribution of rates of return.
- (iii) The investors' risk estimates are proportional to the variance of return they perceive for a security or portfolio.
- (iv) Investors base their investment decisions on two criteria i.e. expected return and variance of return.
- (v) All investors are risk averse. For a given expected return he prefers to take minimum risk, for a given level of risk the investor prefers to get maximum expected return.
- (vi) Investors are assumed to be rational in so far as they would prefer greater returns to lesser ones given equal or smaller risk and are risk averse. Risk aversion in this context means merely that, as between two investments with equal expected returns, the investment with the smaller risk would be preferred.
- (vii) 'Return' could be any suitable measure of monetary inflows like NPV but yield has been the most commonly used measure of return, so that where the standard deviation of returns is referred to it is meant the standard deviation of yield about its expected value.

5.2 Efficient Frontier

Markowitz has formalised the risk return relationship and developed the concept of efficient frontier. For selection of a portfolio, comparison between combinations of portfolios is essential. As a rule, a portfolio is not efficient if there is another portfolio with:

- A higher expected value of return and a lower standard deviation (risk).
- A higher expected value of return and the same standard deviation (risk)
- The same expected value but a lower standard deviation (risk)

Markowitz has defined the diversification as the process of combining assets that are less than perfectly positively correlated in order to reduce portfolio risk without sacrificing any portfolio returns. If an investors' portfolio is not efficient he may:

- Increase the expected value of return without increasing the risk.
- Decrease the risk without decreasing the expected value of return, or
- Obtain some combination of increase of expected return and decrease risk.

This is possible by switching to a portfolio on the efficient frontier.

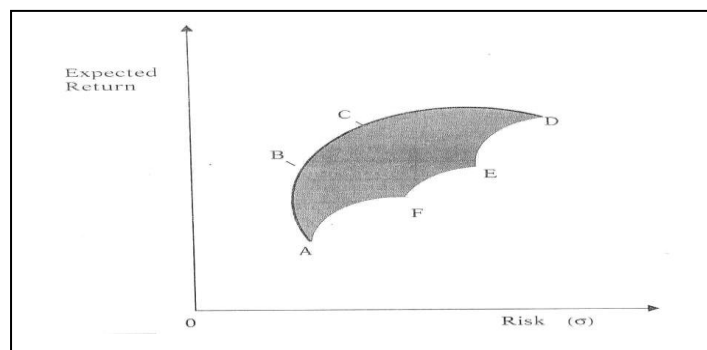


Fig. 1: Markowitz Efficient Frontier

If all the investments are plotted on the risk-return space, individual securities would be dominated by portfolios, and the efficient frontier would be containing all Efficient Portfolios (An Efficient Portfolio has the highest return among all portfolios with identical risk and the lowest risk among all portfolios with identical return). Fig – 1 depicts the boundary of possible investments in securities, A, B, C, D, E and F; and B, C, D, are lying on the efficient frontier.

The best combination of expected value of return and risk (standard deviation) depends upon the investors' utility function. The individual investor will want to hold that portfolio of securities which places him on the highest indifference curve, choosing from the set of available portfolios. The dark line at the top of the set is the line of efficient combinations, or the efficient frontier. The optimal portfolio for an investor lies at the point where the indifference curve for the concerned investor touches the efficient frontier. This point reflects the risk level acceptable to the investor in order to achieve a desired return and provide maximum return for the bearable level of risk. The concept of efficient frontier and the location of the optimal portfolio are explained with help of Fig -2.

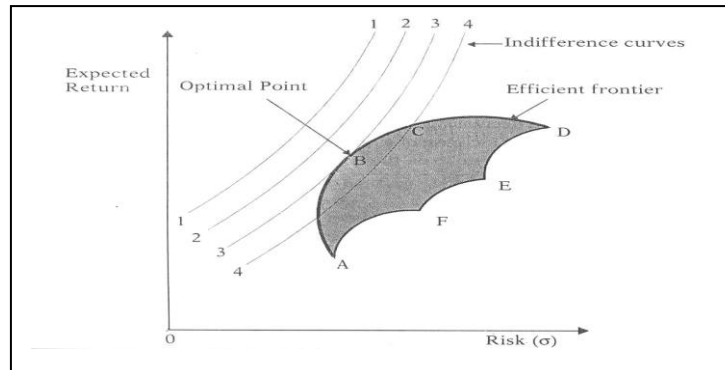


Fig. 2 : Optimal Investment under Markowitz Model

In Fig-2 A, B, C, D, E and F define the boundary of all possible investments out of which investments in B, C and D are the efficient portfolios lying on the efficient frontier. The attractiveness of the investment proposals lying on the efficient frontier depends on the investors' attitude to risk. At point B, the level of risk and return is at optimum level. The returns are highest at point D, but simultaneously it carries higher risk than any other investment.

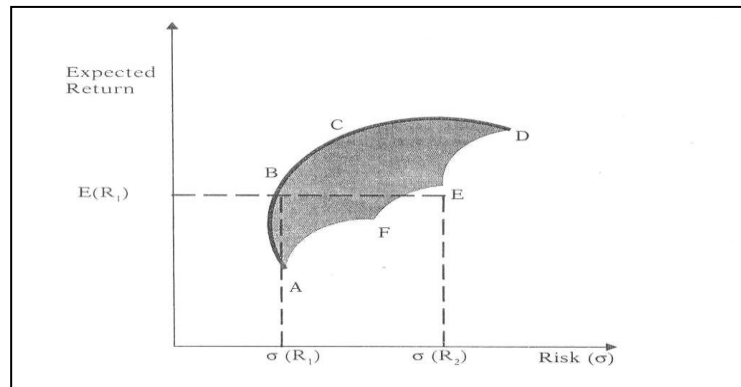


Fig.3 : Selection of Portfolios

The shaded area represents all attainable or feasible portfolios, that is all the combinations of risk and expected return which may be achieved with the available securities. The efficient frontier contains all possible efficient portfolios and any point on the frontier dominates any point to the right of it or below it.

Consider the portfolios represented by points B and E. B and E promise the same expected return $E(R_1)$ but the risk associated with B is $\sigma(R_1)$ whereas the associated with E is $\sigma(R_2)$. Investors, therefore, prefer portfolios on the efficient frontier rather than interior portfolios given the assumption of risk aversion; obviously, point A on the frontier represents the portfolio with the least possible risk, whilst D represents the portfolio with the highest possible rate of return with highest risk.

The investor has to select a portfolio from the set of efficient portfolios lying on the efficient frontier. This will depend upon his risk-return preference. As different investors have different preferences, the optimal portfolio of securities will vary from one investor to another.

6. Capital Asset Pricing Model (CAPM)

The CAPM distinguishes between risk of holding a single asset and holding a portfolio of assets. There is a trade off between risk and return. Modern portfolio theory concentrates on risk and stresses on risk management rather than on return management. Risk may be security risk involving danger of loss of return from an investment in a single financial or capital asset. Security risk differs from portfolio risk, which is the probability of loss from investment in a portfolio of assets. Portfolio risk is comprised of unsystematic risk and systematic risk. Unsystematic risks can be averted through diversification and is related to random variables. Systematic risk is market related component of portfolio risk. It is commonly measured by regression coefficient Beta or the Beta coefficient. Low Beta reflects low risk and high Beta reflects high risk.

As the unsystematic risk can be diversified by building a portfolio, the relevant risk is the non-diversifiable component of the total risk. As mentioned earlier, it can be measured by using Beta (β) a statistical parameter which measures the market sensitivity of returns. The beta for the market is equal to 1.0. Beta explains the systematic relationship between the return on a security and the return on the market by using a simple linear regression equation. The return on a security is taken as a dependent variable and the return on market is taken as independent variable then $R_j = R_f + \beta (R_m - R_f)$. The beta parameter β in this William Sharpe model represents the slope of the above regression relationship and measures the sensitivity or responsiveness of the security returns to the general market returns. The portfolio beta is merely the weighted average of the betas of individual securities included in the portfolio.

Portfolio beta $\beta = \sum$ proportion of security \times beta for security.

CAPM provides a conceptual framework for evaluating any investment decision where capital is committed with a goal of producing future returns. CAPM is based on certain assumptions to provide conceptual framework for evaluating risk and return. Some of the important assumptions are discussed below:

- (i) **Efficient market:** It is the first assumption of CAPM. Efficient market refers to the existence of competitive market where financial securities and capital assets are bought and sold with full information of risk and return available to all participants. In an efficient market, the price of individual assets will reflect a real or intrinsic value of a share as the market prices will adjust quickly to any new situation, John J. Hampton has remarked in "Financial decision making" that although efficient capital market is not much relevant to capital budgeting decisions, but CAPM would be useful to evaluate capital budgeting proposal because the company can compare risk and return to be obtained by investment in machinery with risk and return from investment in securities.
- (ii) **Rational investment goals:** Investors desire higher return for any acceptable level of risk or the lowest risk for any desired level of return. Such a rational choice is made on logical and consistent ranking of proposals in order of preference for higher good to

lower good and this is the scale of the marginal efficiency of capital. Besides, transactive preferences and certainty equivalents are other parameters of rational choice.

- (iii) Risk aversion in efficient market is adhered to although at times risk seeking behaviour is adopted for gains.
- (iv) CAPM assumes that all assets are divisible and liquid assets.
- (v) Investors are able to borrow freely at a risk less rate of interest i.e. borrowings can fetch equal return by investing in safe Government securities.
- (vi) Securities can be exchanged without payment of brokerage, commissions or taxes and without any transaction cost.
- (vii) Securities or capital assets face no bankruptcy or insolvency.

Based on above assumptions the CAPM is developed with the main goal to formulate the return required by investors from a single investment or a portfolio of assets. The required rate of return is defined as the minimum expected return needed so that investors will purchase and hold an asset.

Risk and return relationship in this model stipulates higher return for higher level of risk and *vice versa*. However, there may be exception to this general rule where markets are not efficient.

Three aspects are worth consideration:

- (a) Stock market is not concerned with diversifiable risk
- (b) It is not concerned with an investor having a diversified portfolio
- (c) Compensation paid is restricted to non-diversifiable risk.

Thus, an investor has to look into the non-diversifiable portion of risk on one side and returns on the other side. To establish a link between the two, the required return one expects to get for a given level of risk has been mandated by the Capital Asset Pricing Model.

If the risk-free investment R_f is 5%, an investor can earn this return of 5% by investing in risk free investment. Again, if the stock market earns a rate of return R_m which is 15% then an investor investing in stocks constituting the stock market index will earn also 15%. Thus the excess return earned over and above the risk free return is called the risk premium ($R_m - R_f$) ie $(15\% - 5\%) = 10\%$ which is the reward for undertaking risk. So, if an investment is as risky as the stock market, the risk premium to be earned is 10%.

If an investment is 30% riskier than the stock market, it would carry risk premium i.e. 30% more than the risk premium of the stock market i.e. $10\% + 30\% \text{ of } 10\% = 10\% + 3\% = 13\%$. β identifies how much more risky is an investment with reference to the stock market. Hence the risk premium that a stock should earn is β times the risk premium from the market [$\beta \times (R_m - R_f)$]. The total return from an investment is the risk free rate of return plus the risk premium. So the required return from a stock would be $R_j = R_f + [\beta \times (R_m - R_f)]$. In the above example $5\% + 1.3 \times (15-5) = 18\%$

7.30 Strategic Financial Management

The risk premium on a stock varies in direct proportion to its Beta. If the market risk premium is 6% and β of a stock is 1.2 then the risk premium for that stock is 7.2% ($6\% \times 1.2$) where $(R_m - R_f) = 6\%$ and $\beta = 1.2$

Illustration 1

A company's beta is 1.40. The market return is 14%. The risk free rate is 10% (i) What is the expected return based on CAPM (ii) If the risk premium on the market goes up by 2.5% points, what would be the revised expected return on this stock?

Solution

- (i) Computation of expected return based on CAPM

$$R_j = R_f + \beta (R_m - R_f) = 10\% + 1.40 (14\% - 10\%) = 10\% + 5.6\% = 15.6\%$$

- (ii) Computation of risk premium if the market goes up by 2.5 points

The return from the market goes up by 2.5% i.e. $14\% + 2.5\% = 16.5\%$

Expected Return based on CAPM is given by

$$R_j = 10\% + 1.40 (16.5\% - 10\%) = 10\% + 1.40 \times 6.5\% = 10\% + 9.1\% = 19.1\%$$

6.1 Security Market Line

A graphical representation of CAPM is the Security Market Line, (SML). This line indicates the rate of return required to compensate at a given level of risk. Plotting required return on Y axis and Beta on the X-axis we get an upward sloping line which is given by $(R_m - R_f)$, the risk premium.

The higher the Beta value of a security, higher would be the risk premium relative to the market. This upward sloping line is called the Security Market Line. It measures the relationship between systematic risk and return.

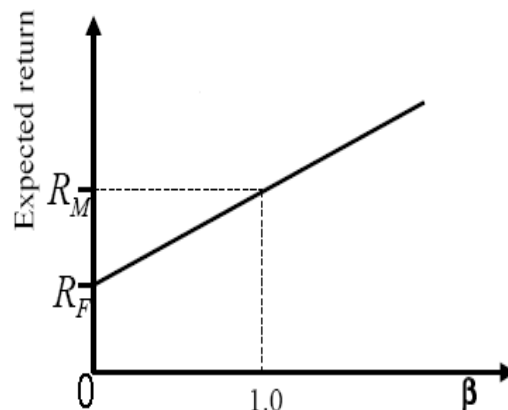


Illustration 2

The risk premium for the market is 10%. Assuming Beta values of 0, 0.25, 0.42, 1.00 and 1.67. Compute the risk premium on Security K.

Solution

Market Risk Premium is 10%

β Value of K	Risk Premium of K
0.00	0%
0.25	2.50%
0.42	4.20%
1.00	10.00%
1.67	16.70%

Illustration 3

Treasury Bills give a return of 5%. Market Return is 13% (i) What is the market risk premium (ii) Compute the β Value and required returns for the following combination of investments.

Treasury Bill	100	70	30	0
Market	0	30	70	100

Solution

Risk Premium $R_m - R_f = 13\% - 5\% = 8\%$

β is the weighted average investing in portfolio consisting of market $\beta = 1$ and treasury bills ($\beta = 0$)

Portfolio	Treasury Bills: Market	β	$R_j = R_f + \beta \times (R_m - R_f)$
1	100:0	0	$5\% + 0(13\%-5\%)=5\%$
2	70:30	$0.7(0)+0.3(1)=0.3$	$5\%+0.3(13\%-5\%)=7.40\%$
3	30:70	$0.3(0)+0.7(1)=0.7$	$5\%+0.7(13\%-5\%)=10.60\%$
4	0:100	1	$5\%+1.0(13\%-5\%)=13\%$

6.2 Risk free Rate of Return

In CAPM, there is only one risk free rate. It presumes that the returns on a security include both directed payments and capital appreciation. These require to be factored in judging the value of Beta and in computing the required rate of return.

Illustration 4

Pearl Ltd. expects that considering the current market prices, the equity share holders should get a return of at least 15.50% while the current return on the market is 12%. RBI has closed the latest auction for ₹ 2500 crores of 182 day bills for the lowest bid of 4.3% although there were bidders at a higher rate of 4.6% also for lots of less than ₹ 10 crores. What is Pearl Ltd's Beta?

Solution

Determining Risk free rate: Two risk free rates are given. The aggressive approach would be to consider 4.6% while the conservative approach would be to take 4.3%. If we take the moderate value then the simple average of the two i.e. 4.45% would be considered

7.32 Strategic Financial Management

Application of CAPM

$$R_j = R_f + \beta (R_m - R_f)$$

$$15.50\% = 4.45\% + \beta (12\% - 4.45\%)$$

$$\beta = \frac{15.50\% - 4.45\%}{12\% - 4.45\%} = \frac{11.05}{7.55}$$

$$= 1.464$$

Illustration 5

The following information is available with respect of Jaykay Ltd.

Year	Jay Kay Limited		Market		Return on Govt. Bonds
	Average Share Price (₹)	DPS (₹)	Average Index	Dividend Yield (%)	
2002	242	20	1812	4	6
2003	279	25	1950	5	5
2004	305	30	2258	6	4
2005	322	35	2220	7	5

Compute Beta Value of the company as at the end of 2005. What is your observation?

Solution

Computation of Beta Value

Calculation of Returns

$$\text{Returns} = \frac{D_1 + (P_1 - P_0)}{P_0} \times 100$$

Year	Returns
2002 – 2003	$\frac{25 + (279 - 242)}{242} \times 100 = 25.62\%$
2003 – 2004	$\frac{30 + (305 - 279)}{279} \times 100 = 20.07\%$
2004 – 2005	$\frac{35 + (322 - 305)}{305} \times 100 = 17.05\%$

Calculation of Returns from market Index

Year	% of Index Appreciation	Dividend Yield %	Total Return %
2002 – 2003	$\frac{1950 - 1812}{1812} \times 100 = 7.62\%$	5%	12.62%
2003 – 2004	$\frac{2258 - 1950}{1950} \times 100 = 15.79\%$	6%	21.79%
2004 – 2005	$\frac{2220 - 2258}{2258} \times 100 = (-)1.68\%$	7%	5.32%

Computation of Beta

Year	X	Y	XY	Y ²
2002-2003	25.62	12.62	323.32	159.26
2003-2004	20.07	21.79	437.33	474.80
2004-2005	17.05	5.32	90.71	28.30
	62.74	39.73	851.36	662.36

$$\bar{X} = \frac{62.74}{3} = 20.91, \bar{Y} = \frac{39.73}{3} = 13.24$$

$$\begin{aligned} \beta &= \frac{\sum XY - n\bar{X}\bar{Y}}{\sum Y^2 - n\bar{Y}^2} \\ &= \frac{851.36 - 3(20.91)(13.24)}{662.36 - 3(13.24)^2} \\ &= \frac{851.36 - 830.55}{662.36 - 525.89} = \frac{20.81}{136.47} = 0.15 \end{aligned}$$

6.3 Under Valued and Over Valued Stocks

The CAPM model can be practically used to buy, sell or hold stocks. CAPM provides the required rate of return on a stock after considering the risk involved in an investment. Based on current market price or any other judgmental factors (benchmark) one can identify as to what would be the expected return over a period of time. By comparing the required return with the expected return the following investment decisions are available.

- (a) **When CAPM < Expected Return – Buy:** This is due to the stock being undervalued i.e. the stock gives more return than what it should give.
- (b) **When CAPM > Expected Return – Sell:** This is due to the stock being overvalued i.e. the stock gives less return than what it should give.
- (c) **When CAPM = Expected Return – Hold:** This is due to the stock being correctly valued i.e. the stock gives same return than what it should give.

7.34 Strategic Financial Management

From another angle, if the current market price is considered as a basis of CAPM then:

- (i) Actual Market Price < CAPM, stock is undervalued
- (ii) Actual market Price > CAPM, stock is overvalued
- (iii) Actual market Price = CAPM, stock is correctly valued.

Illustration 6

The expected returns and Beta of three stocks are given below

Stock	A	B	C
Expected Return (%)	18	11	15
Beta Factor	1.7	0.6	1.2

If the risk free rate is 9% and the expected rate of return on the market portfolio is 14% which of the above stocks are over, under or correctly valued in the market? What shall be the strategy?

Solution

Required Rate of Return is given by

$$R_j = R_f + \beta (R_m - R_f)$$

For Stock A, $R_j = 9 + 1.7 (14 - 9) = 17.50\%$

Stock B, $R_j = 9 + 0.6 (14 - 9) = 12.00\%$

Stock C, $R_j = 9 + 1.2 (14 - 9) = 15.00\%$

Required Return %	Expected Return %	Valuation	Decision
17.50%	18.00%	Under Valued	Buy
12.00%	11.00%	Over Valued	Sell
15.00%	15.00%	Correctly Valued	Hold

Illustration 7

Information about return on an investment is as follows:

- (a) Risk free rate 10% (b) Market Return is 15% (c) Beta is 1.2
 - (i) What would be the return from this investment?
 - (ii) If the projected return is 18%, is the investment rightly valued?
 - (iii) What is your strategy?

Solution

Required rate of Return as per CAPM is given by

$$\begin{aligned} R_j &= R_f + \beta (R_m - R_f) \\ &= 10 + 1.2 (15 - 10) = 16\% \end{aligned}$$

If projected return is 18%, the stock is undervalued as CAPM < Expected Return .The Decision should be BUY.

6.4 Modification for leverage

The above-mentioned discussions have assumed all equity financing and that the beta used in the equations is an unlevered beta. However, the beta is actually a function of the leverage as well as the business risk. As a company increases the proportion of debt capital in its capital structure, both its beta and the required return increase in a linear manner. Hence in case one wishes to use the CAPM as a model for valuing cost of equity in order to determine financially feasible investments, one needs to take into account the difference of leverage in the proxy company/project and the company/project whose required return is to be computed.

Mathematically

$$\beta_j = \beta_{uj} \left[1 + \frac{D}{S} (1-T) \right]$$

where β_j & β_{uj} are the levered and unlevered betas respectively., D/S is the debt to equity ratio in market value terms and T is the corporate tax rate.

6.5 Advantages and Limitations of CAPM

The advantages of CAPM can be listed as:

- (i) *Risk Adjusted Return*: It provides a reasonable basis for estimating the required return on an investment which has risk in built into it. Hence it can be used as Risk Adjusted Discount Rate in Capital Budgeting.
- (ii) *No Dividend Company*: It is useful in computing the cost of equity of a company which does not declare dividend.

There are certain limitations of CAPM as well, which are discussed as follows:

- (a) *Reliability of Beta*: Statistically reliable Beta might not exist for shares of many firms. It may not be possible to determine the cost of equity of all firms using CAPM. All shortcomings that apply to Beta value applies to CAPM too.
- (b) *Other Risks*: By emphasizing on systematic risk only, unsystematic risks are of importance to share holders who do not possess a diversified portfolio.
- (c) *Information Available*: It is extremely difficult to obtain important information on risk free interest rate and expected return on market portfolio as there is multiple risk free rates for one while for another, markets being volatile it varies over time period.

7. Arbitrage Pricing Theory Model (APT)

Unlike the CAPM which is a single factor model, the APT is a multi factor model having a whole set of Beta Values – one for each factor. Arbitrage Pricing Theory states that the expected return on an investment is dependent upon how that investment reacts to a set of individual macro-economic factors (degree of reaction measured by the Betas) and the risk premium associated with each of those macro – economic factors. The APT developed by Ross (1976) holds that there are four factors which explain the risk premium relationship of a particular security. Several factors being identified e.g. inflation and money supply, interest rate, industrial production and personal consumption have aspects of being inter-related.

According to CAPM, $E(R_i) = R_f + \lambda \beta_i$

7.36 Strategic Financial Management

Where, λ is the average risk premium $[E(R_m) - R_f]$

$$\text{In APT, } E(R_i) = R_f + \lambda_1 \beta_{i_1} + \lambda_2 \beta_{i_2} + \lambda_3 \beta_{i_3} + \lambda_4 \beta_{i_4}$$

Where, $\lambda_1, \lambda_2, \lambda_3, \lambda_4$ are average risk premium for each of the four factors in the model and $\beta_{i_1}, \beta_{i_2}, \beta_{i_3}, \beta_{i_4}$ are measures of sensitivity of the particular security i to each of the four factors.

8. Sharpe Index Model

William Sharpe has developed a simplified variant of Markowitz model that reduces substantially its data and computational requirements. It is known as Single index model or One-factor analysis.

8.1 Single Index Model

This model assumes that co-movement between stocks is due to change or movement in the market index. Casual observation of the stock prices over a period of time reveals that most of the stock prices move with the market index. When the Sensex increases, stock prices also tend to increase and vice-versa. This indicates that some underlying factors affect the market index as well as the stock prices. Stock prices are related to the market index and this relationship could be used to estimate the return on stock. Towards this purpose, the following equation can be used:

$$R_i = \alpha_i + \beta_i R_m + \epsilon_i$$

Where,

R_i = expected return on security i

α_i = intercept of the straight line or alpha co-efficient

β_i = slope of straight line or beta co-efficient

R_m = the rate of return on market index

ϵ_i = error term.

According to the equation, the return of a stock can be divided into two components, the return due to the market and the return independent of the market. β_i indicates the sensitiveness of the stock return to the changes in the market return. For example, β_i of 1.5 means that the stock return is expected to increase by 1.5 % when the market index return increases by 1 % and vice-versa. Likewise, β_i of 0.5 expresses that the individual stock return would change by 0.5 per cent when there is a change of 1 per cent in the market return. β_i of 1 indicates that the market return and the security return are moving in tandem. The estimates of β_i and α_i are obtained from regression analysis.

The single index model is based on the assumption that stocks vary together because of the common movement in the stock market and there are no effects beyond the market (i.e. any fundamental factor effects) that account the stocks co-movement. The expected return,

standard deviation and co-variance of the single index model represent the joint movement of securities. The mean return is:

$$R_i = \alpha_i + \beta_i R_m + \epsilon_i$$

The variance of security's return:

$$\sigma_i^2 = \beta_i^2 \sigma_m^2 + \sigma_{\epsilon_i}^2$$

The covariance of returns between securities i and j is:

$$\sigma_{ij} = \beta_i \beta_j \sigma_m^2$$

The variance of the security has two components namely, systematic risk or market risk and unsystematic risk or unique risk. The variance explained by the index is referred to systematic risk. The unexplained variance is called residual variance or unsystematic risk.

The systematic risk can be calculated by using following formula:

$$\begin{aligned} \text{Systematic risk} &= \beta_i^2 \times \text{variance of market index} \\ &= \beta_i^2 \sigma_m^2 \end{aligned}$$

Unsystematic risk = Total variance - Systematic risk.

$$\epsilon_i^2 = \sigma_i^2 - \text{Systematic risk.}$$

Thus, the total risk = Systematic risk + Unsystematic risk.

$$= \beta_i^2 \sigma_m^2 + \epsilon_i^2.$$

From this, the portfolio variance can be derived

$$\sigma_p^2 = \left[\left(\sum_{i=1}^N X_i \beta_i \right)^2 \sigma_m^2 \right] + \left[\left(\sum_{i=1}^N X_i^2 \epsilon_i^2 \right) \right]$$

Where,

$$\sigma_p^2 = \text{variance of portfolio}$$

$$\sigma_m^2 = \text{expected variance of index}$$

$$\epsilon_i^2 = \text{variation in security's return not related to the market index}$$

$$X_i = \text{the portion of stock i in the portfolio.}$$

$$\beta_i = \text{Beta of stock i in the portfolio}$$

Likewise expected return on the portfolio also can be estimated. For each security α_i and β_i should be estimated.

$$R_p = \sum_{i=1}^N X_i (\alpha_i + \beta_i R_m)$$

7.38 Strategic Financial Management

β_i = Value of the beta for security i

x_i = Proportion of the investment on security i

α_i = Value of alpha for security i

N = The number of securities in the portfolio

Portfolio return is the weighted average of the estimated return for each security in the portfolio. The weights are the respective stocks' proportions in the portfolio.

A portfolio's alpha value is a weighted average of the alpha values for its component securities using the proportion of the investment in a security as weight.

$$\alpha_p = \sum_{i=1}^N x_i \alpha_i$$

α_p = Value of the alpha for the portfolio

Similarly, a portfolio's beta value is the weighted average of the beta values of its component stocks using relative share of them in the portfolio as weights.

$$\beta_p = \sum_{i=1}^N x_i \beta_i$$

Where,

β_p = Value of the beta for the portfolio.

Illustration 8

The following details are given for X and Y companies' stocks and the Bombay Sensex for a period of one year. Calculate the systematic and unsystematic risk for the companies' stocks. If equal amount of money is allocated for the stocks what would be the portfolio risk?

	X Stock	Y Stock	Sensex
Average return	0.15	0.25	0.06
Variance of return	6.30	5.86	2.25
β	0.71	0.685	
Correlation Co-efficient	0.424		
Co-efficient of determination (r^2)	0.18		

Solution

The co-efficient of determination (r^2) gives the percentage of the variation in the security's return that is explained by the variation of the market index return. In the X company stock return, 18 per cent of variation is explained by the variation of the index and 82 per cent is not explained by the index.

According to Sharpe, the variance explained by the index is the systematic risk. The unexplained variance or the residual variance is the unsystematic risk.

Company X:

Systematic risk = $\beta_1^2 \times \text{Variance of market index}$
 = $(0.71)^2 \times 2.25 = 1.134$

Unsystematic risk (ϵ_i^2) = Total variance of security return - systematic risk
 = $6.3 - 1.134$
 = 5.166 or
 = Variance of Security Return $(1-r^2)$
 = $6.3 \times (1-0.18) = 6.3 \times 0.82 = 5.166$

Total risk = $\beta_1^2 \times \sigma_m^2 + \epsilon_i^2$
 = $1.134 + 5.166 = 6.3$

Company Y:

Systematic risk = $\beta_1^2 \times \sigma_m^2$
 = $(0.685)^2 \times 2.25 = 1.056$

Unsystematic risk = Total variance of the security return - systematic risk.
 = $5.86 - 1.056 = 4.804$

$$\sigma_p^2 = \left[\left(\sum_{i=1}^N X_i \beta_i \right)^2 \sigma_m^2 \right] + \left[\left(\sum_{i=1}^N X_i^2 \epsilon_i^2 \right) \right]$$

= $[(0.5 \times 0.71 + 0.5 \times 0.685)^2 \times 2.25] + [(0.5)^2(5.166) + (0.5)^2(4.804)]$
 = $[(0.355 + 0.3425)^2 \times 2.25] + [(1.292 + 1.201)]$
 = $1.0946 + 2.493 = 3.5876$

8.2 Sharpe and Treynor Ratios

These two ratios measure the Risk Premium per unit of Risk for a security or a portfolio of securities and provide the tools for comparing the performance of diverse securities and portfolios. Sharpe Ratio is defined as $(R_i - R_f)/\sigma_i$ and Treynor Ratio is defined as

$$\frac{R_i - R_f}{\beta_i}$$

Where,

- R_i = Expected return on stock i
- R_f = Return on a risk less asset
- σ_i = Standard Deviation of the rates of return for the ith Security
- β_i = Expected change in the rate of return on stock i associated with one unit change in the market return

Higher the Risk Premium generated by a security or portfolio per unit of risk, the better and these ratios provide a useful tool for comparing securities and portfolios with diverse risk return profiles. While the Sharpe Ratio uses the standard deviation as the measure of risk, the Treynor Ratio uses the beta as the measure of risk.

7.40 Strategic Financial Management

The steps for finding out the stocks to be included in the optimal portfolio are given below:

- Find out the “excess return to beta” ratio for each stock under consideration.
- Rank them from the highest to the lowest.
- Proceed to calculate C_i for all the stocks/portfolios according to the ranked order using the following formula:

$$C_i = \frac{\sigma_m^2 \sum_{i=1}^N \frac{(R_i - R_f) \beta_i}{\sigma_{ei}^2}}{1 + \sigma_m^2 \sum_{i=1}^N \frac{\beta_i^2}{\sigma_{ei}^2}}$$

Where,

σ_m^2 = variance of the market index

σ_{ei}^2 = variance of a stock's movement that is not associated with the movement of market index i.e. stock's unsystematic risk.

- Compute the cut-off point which the highest value of C_i and is taken as C^* . The stock whose excess-return to risk ratio is above the cut-off ratio are selected and all whose ratios are below are rejected. The main reason for this selection is that since securities are ranked from highest excess return to Beta to lowest, and if particular security belongs to optional portfolio all higher ranked securities also belong to optimal portfolio.
- Once we came to know which securities are to be included in the optimum portfolio, we shall calculate the percent to be invested in each security by using the following formula:

$$X_i^0 = \frac{Z_i}{\sum_{j=1}^N Z_j}$$

where

$$Z_i = \frac{\beta_i}{\sigma_{ei}^2} \left(\frac{R_i - R_o}{\beta_i} - C^* \right)$$

The first portion determines the weight each stock and total comes to 1 to ensure that all funds are invested and second portion determines the relative investment in each security.

Illustration 9

Data for finding out the optimal portfolio are given below:

Security Number	Mean Return	Excess Return	Beta	Unsystematic Risk	Excess Return to Beta
	R_i	$R_i - R_f$	β	σ_{ei}^2	$\frac{R_i - R_f}{\beta_i}$
1	19	14	1.0	20	14
2	23	18	1.5	30	12
3	11	6	0.5	10	12
4	25	20	2.0	40	10
5	13	8	1.0	20	8
6	9	4	0.5	50	8
7	14	9	1.5	30	6

The riskless rate of interest is 5 per cent and the market variance is 10. Determine the cut-off point.

Solution

Security	$\frac{R_i - R_f}{\beta_i}$	$\frac{(R_i - R_f) \times \beta_i}{\sigma_{ei}^2}$	$\sum_{i=1}^N \frac{(R_i - R_f) \times \beta_i}{\sigma_{ei}^2}$	$\frac{\beta_i^2}{\sigma_{ei}^2}$	$\sum_{i=1}^N \frac{\beta_i^2}{\sigma_{ei}^2}$	C_i
1	14	0.7	0.7	0.05	0.05	4.67
2	12	0.9	1.6	0.075	0.125	7.11
3	12	0.3	1.9	0.025	0.15	7.60
4	10	1.0	2.9	0.1	0.25	8.29
5	8	0.4	3.3	0.05	0.3	8.25
6	8	0.04	3.34	0.005	0.305	8.25
7	6	0.45	3.79	0.075	0.38	7.90

'C_i' calculations are given below:

For Security 1

$$C_1 = \frac{10 \times 0.7}{1 + 10(.05)} = 4.67$$

Here 0.7 is got from column 4 and 0.05 from column 6. Since the preliminary calculations are over, it is easy to calculate the C_i.

$$C_2 = \frac{10 \times 1.6}{1 + 10(.125)} = 7.11$$

$$C_3 = \frac{10 \times 1.9}{1 + 10(0.15)} = 7.6$$

$$C_4 = \frac{10 \times 2.9}{1 + 10(0.25)} = 8.29$$

7.42 Strategic Financial Management

$$C_5 = \frac{10 \times 3.3}{1 + 10(0.3)} = 8.25$$

$$C_6 = \frac{10 \times 3.34}{1 + 10(0.305)} = 8.25$$

$$C_7 = \frac{10 \times 3.79}{1 + 10(0.38)} = 7.90$$

The highest C_i value is taken as the cut-off point i.e. C^* . The stocks ranked above C^* have high excess returns to beta than the cut-off C and all the stocks ranked below C^* have low excess returns to beta. Here, the cut-off point is 8.29. Hence, the first four securities i.e. 1 – 4 are selected and remaining 3 are rejected.

Now we shall compute how much to be invested in each security by calculating Z_i for these four securities as follows:

$$Z_i = \frac{B_i}{\sigma_i^2} \left(\frac{R_i - R_0}{1B_i} - C^* \right)$$

Thus,

$$Z_1 = \frac{1.00}{20} \left(\frac{14}{1.0} - 8.29 \right) = 0.05 (5.71) = 0.2855$$

$$Z_2 = \frac{1.5}{30} \left(\frac{18}{1.5} - 8.29 \right) = 0.05 (3.71) = 0.1855$$

$$Z_3 = \frac{0.5}{10} \left(\frac{6}{0.5} - 8.29 \right) = 0.05 (3.71) = 0.1855$$

$$Z_4 = \frac{2}{40} \left(\frac{20}{2} - 8.29 \right) = 0.05 (1.71) = 0.0855$$

The proportion of investment in each stock will be computed as follows:

$$X_i = \frac{Z_i}{\sum_{i=1}^n Z_j}$$

Thus $\sum_{i=1}^n Z_j = 0.2855 + 0.1855 + 0.1855 + 0.0855 = 0.742$

Accordingly, proportion of investments in

$$\text{Security 1} = \frac{0.2855}{0.742} = 0.3848 \text{ i.e. } 38.48\%$$

$$\text{Security 2} = \frac{0.1855}{0.742} = 0.25 \text{ i.e. } 25\%$$

$$\text{Security 3} = \frac{0.1855}{0.742} = 0.25 \text{ i.e. } 25\%$$

$$\text{Security 4} = \frac{0.0855}{0.742} = 0.1152 \text{ i.e. } 11.52\%$$

Thus investment as per following proportion will be the optimal portfolio.

Security 1	—————▶	38.48%
Security 2	—————▶	25%
Security 3	—————▶	25%
Security 4	—————▶	11.52%

9. Formulation of Portfolio Strategy

Two broad choices are required for the formulation of an appropriate portfolio strategy. They are active portfolio strategy and passive portfolio strategy.

9.1 Active Portfolio Strategy (APS): An APS is followed by most investment professionals and aggressive investors who strive to earn superior return after adjustment for risk. The vast majority of funds (or schemes) available in India follow an “active” investment approach, wherein fund managers of “active” funds spend a great deal of time on researching individual companies, gathering extensive data about financial performance, business strategies and management characteristics. In other words, “active” fund managers try to identify and invest in stocks of those companies that they think will produce better returns and beat the overall market (or Index).

There are four principles of an active strategy. These are:

(a) Market Timing: This involves departing from the normal i.e. strategy for long run asset mix to reflect assessment of the prospect of various assets in the near future. Market timing is based on an explicit or implicit forecast of general market movement. A variety of tools are employed for market timing analysis namely business cycle analysis, moving average analysis, advance-decline analysis, Econometric models. The forecast for the general market movement derived with the help of one or more of these tools are tempered by the subjective judgment of the investors. In most cases investor may go largely by its market sense. Those who reveal the fluctuation in the market may be tempted to play the game of market timing but few will succeed in this game. And an investment manager has to forecast the market correctly, 75% of the time just to break even after taking into account the cost of errors and cost of transactions. According to Fisher Black, the market is just as well as on an average when the investor is out of the market as it does when he is in. So he loses money relative to a single buy and sale strategy by being out of the market part of the time.

(b) Sector Rotation: Sector or group rotation may apply to both stock and bond component of the portfolio. It is used more compulsorily with respect to strategy. The components of the portfolio are used when it involves shifting. The weighting for various industry sectors is based on their asset outlook. If one thinks that steel and pharmaceutical would do well as compared

7.44 Strategic Financial Management

to other sectors in the forthcoming period he may overweigh the sector relative to their position in the market portfolio, with the result that his portfolio will be tilted more towards these sectors in comparison to the market portfolio.

With respect to bond portfolio sector rotation it implies a shift in the composition of the bond portfolio in terms of quality as reflected in credit rating, coupon rate, term of maturity etc. If one anticipates a rise in the interest rate one may shift for long term bonds to medium and short term. A long term bond is more sensitive to interest rate variation compared to a short term bond.

(c) Security Selection: Security selection involves a search for under price security. If one has to resort to active stock selection he may employ fundamental / technical analysis to identify stocks which seems to promise superior return and concentrate the stock components of portfolio on them. Such stock will be over weighted relative to their position in the market portfolio. Like wise stock which are perceived to be unattractive will be under weighted relative to their position in the market portfolio.

As far as bonds are concerned security selection calls for choosing bonds which offer the highest yields to maturity and at a given level of risk.

(d) Use of Specialised Investment Concept: To achieve superior return, one has to employ a specialised concept/philosophy particularly with respect to investment in stocks. The concepts which have been exploited successfully are growth stock, neglected or out of favour stocks, asset stocks, technology stocks and cyclical stocks.

The advantage of cultivating a specialized investment concept is that it helps to:

- (i) Focus one's effort on a certain kind of investment that reflects one's ability and talent.
- (ii) Avoid the distraction of perusing other alternatives.
- (iii) Master an approach or style through sustained practice and continual self criticism.

The greatest disadvantage of focusing exclusively on a specialized concept is that it may become obsolete. The changes in the market risk may cast a shadow over the validity of the basic premise underlying the investor philosophy.

9.2 Passive Portfolio Strategy: Active strategy was based on the premise that the capital market is characterized by efficiency which can be exploited by resorting to market timing or sector rotation or security selection or use of special concept or some combination of these vectors.

Passive strategy, on the other hand, rests on the tenet that the capital market is fairly efficient with respect to the available information. Hence they search for superior return. Basically, passive strategy involves adhering to two guidelines. They are:

- (a) Create a well diversified portfolio at a predetermined level of risk.
- (b) Hold the portfolio relatively unchanged over time unless it became adequately diversified or inconsistent with the investor risk return preference.

A fund which is *passively* managed are called index funds. An Index fund is a mutual fund scheme that invests in the securities of the target Index in the same proportion or weightage.

Though it is designed to provide returns that closely track the benchmark Index, an Index Fund carries all the risks normally associated with the type of asset the fund holds. So, when the overall stock market rises/falls, you can expect the price of shares in the index fund to rise/fall, too. In short, an index fund does not mitigate market risks. Indexing merely ensures that your returns will not stray far from the returns on the Index that the fund mimics. In other words, an index fund is a fund whose daily returns are the same as the daily returns obtained from an index. Thus, it is passively managed in the sense that an index fund manager invests in a portfolio which is exactly the same as the portfolio which makes up an index. For instance, the NSE-50 index (Nifty) is a market index which is made up of 50 companies. A Nifty index fund has all its money invested in the Nifty fifty companies, held in the same weights of the companies which are held in the index.

9.3 Selection of Securities: There are certain criteria which must be kept in mind while selecting securities. The selection criteria for both bonds and equity shares are given as following:

9.3.1 Selection of Bonds: Bonds are fixed income avenues. The following factors have to be evaluated in selecting fixed income avenues:

- (a) *Yield to maturity:* The yield to maturity for a fixed income avenues represent the rate of return earned by the investor, if he invests in the fixed income avenues and holds it till its maturity.
- (b) *Risk of Default:* To assess such risk on a bond, one has to look at the credit rating of the bond. If no credit rating is available relevant financial ratios of the firm have to be examined such as debt equity, interest coverage, earning power etc and the general prospect of the industry to which the firm belongs have to be assessed.
- (c) *Tax Shield:* In the past, several fixed income avenues offers tax shields but at present only a few of them do so.
- (d) *Liquidity:* If the fixed income avenues can be converted wholly or substantially into cash at a fairly short notice it possesses a liquidity of a high order.

9.3.2 Selection of Stock (Equity Share): Three approaches are applied for selection of equity shares- Technical analysis, Fundamental analysis and Random selection analysis.

- (a) Technical analysis looks at price behaviours and volume data to determine whether the share will move up or down or remain trend less.
- (b) Fundamental analysis focuses on fundamental factors like earning level, growth prospects and risk exposure to establish intrinsic value of a share. The recommendation to buy hold or sell is based on comparison of intrinsic value and prevailing market price.
- (c) Random selection analysis is based on the premise that the market is efficient and security is properly priced.

Levels of Market Efficiency And Approach To Security Selection

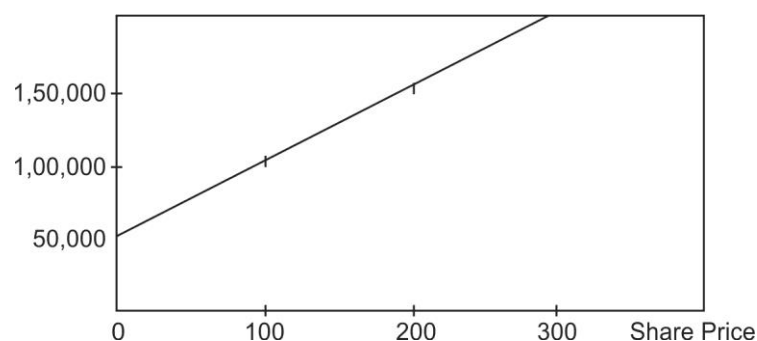
<i>Approach</i> <i>Levels of Efficiency</i>	<i>Technical Analysis</i>	<i>Fundamentals Analysis</i>	<i>Random Selection</i>
1) Inefficiency	Best	Poor	Poor
2) Weak form efficiency	Poor	Best	Poor
3) Semi-strong efficiency	Poor	Good	Fair
4) Strong Form efficiency	Poor	Fair	Best

10. Portfolio Rebalancing

It means the value of portfolio as well as its composition. The relative proportion of bond and stocks may change as stock and bonds fluctuate in response to such changes. Portfolio rebalancing is necessary. There are three policies of portfolio rebalancing- Buy and hold policy, Constant mix policy, and Constant proportion portfolio insurance policy (CPPI). These policies have different pay off under varying market conditions. Under all these policies portfolio consists of investment in stock and bonds.

(a) Buy and Hold Policy: Sometime this policy is also called 'do nothing policy' as under this strategy no balancing is required and therefore investor maintain an exposure to stocks and therefore linearly related to the value of stock in general.

Under this strategy investors set a limit (floor) below which he does not wish the value of portfolio should go. Therefore, he invests an amount equal to floor value in non-fluctuating assets (Bonds). Since the value of portfolio is linearly related to value of stocks the pay-off diagram is a straight line. This can be better understood with the help of an example. Suppose a portfolio consisting of Debt/ Bonds for ₹ 50,000 and ₹ 50,000 in equity shares currently priced at ₹ 100 per share. If price of the share moves from ₹ 100 to ₹ 200 the value of portfolio shall become ₹ 1,50,000. The pay-off diagram is shown in figure below i.e. a straight line:



This policy is suitable for the investor whose risk tolerance is positively related to portfolio and stock market return but drops to zero of below floor value.

Concluding, it can be said that following are main features of this policy:

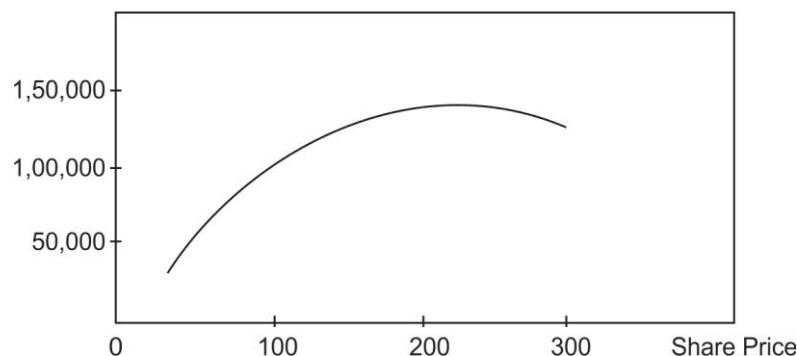
- (a) The value of portfolio is positively related and linearly dependent on the value of the stock.
- (b) The value of portfolio cannot fall below the floor value i.e. investment in Bonds.
- (c) This policy performs better if initial percentage is higher in stock and stock outperform the bond. Reverse will happen if stock under perform in comparison of bond or their prices goes down.

(b) Constant Mix Policy: Contrary to above policy this policy is a 'do something policy'. Under this policy investor maintains an exposure to stock at a constant percentage of total portfolio. This strategy involves periodic rebalancing to required (desired) proportion by purchasing and selling stocks as and when their prices goes down and up respectively. In other words this plan specifies that value of aggressive portfolio to the value of conservative portfolio will be held constant at a pre-determined ratio. However, it is important that this action is taken only there is change in the prices of share at a predetermined percentage.

For example if an investor has decided that his portfolio shall consist of 60% in equity shares and balance 40% in bonds on upward or downward of 10% in share prices he will strike a balance.

In such situation if the price of share goes down by 10% or more, he will sell the bonds and invest money in equities so that the proportion among the portfolio i.e. 60:40 remains the same. According if the prices of share goes up by 10% or more he will sell equity shares and shall in bonds so that the ratio remains the same i.e. 60:40. This strategy is suitable for the investor whose tolerance varies proportionally with the level of wealth and such investor holds equity at all levels.

The pay-off diagram of this policy shall be as follows:



Accordingly, it gives a concave pay off, tends to do well in flat but fluctuating market.

Continuing above example let us how investor shall rebalance his portfolio under different scenarios as follows:

7.48 Strategic Financial Management

(a) If price decreases

Share Price		Value of Shares	Value of Bonds	Total	Stock to Bond Switching	Bond to Stock Switching
100	Starting Level	50,000	50,000	1,00,000	-	-
80	Before Rebalancing	40,000	50,000	90,000	-	-
	After Rebalancing	45,000	45,000	90,000	-	5,000
60	Before Rebalancing	33,750	45,000	78,750	-	-
	After Rebalancing	39,360	39,390	78,750	-	5,610

(b) If price increases

Share Price		Value of Shares	Value of Bonds	Total	Stock to Bond Switching	Bond to Stock Switching
100	Starting Level	50,000	50,000	1,00,000	-	-
150	Before Rebalancing	75,000	50,000	1,25,000	-	-
	After Rebalancing	62,400	62,600	1,25,000	12,600	-
200	Before Rebalancing	83,200	62,600	1,45,800	-	-
	After Rebalancing	72,800	73,000	1,45,800	10,400	-

(c) Constant Proportion Insurance Policy (CPPI): Under this strategy investor sets a floor below which he does not wish his asset to fall called floor, which is invested in some non-fluctuating assets such as Treasury Bills, Bonds etc. The value of portfolio under this strategy shall not fall below this specified floor under normal market conditions. This strategy performs well especially in bull market as the value of shares purchased as cushion increases. In contrast in bearish market losses are avoided by sale of shares. It should however be noted that this strategy performs very poorly in the market hurt by sharp reversals. The following equation is used to determine equity allocation:

Target Investment in Shares = multiplier (Portfolio Value – Floor Value)

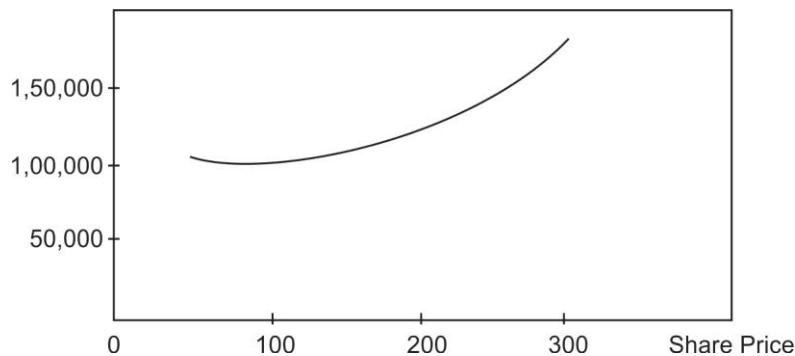
Multiplier is a fixed constant whose value shall be more than 1.

The pay-off under this strategy can be understood better with the help of an example. Suppose wealth of Mr. A is ₹ 10,00,000, a floor value of ₹ 7,50,000 and a multiplier of 2. Since the initial cushion (difference between Portfolio Value and Floor) is ₹ 2,50,000, the initial investment in the share shall be ₹ 5,00,000 (double of the initial cushion). Accordingly, initial portfolio mix shall be consisted of ₹ 5,00,000 in shares and balance ₹ 5,00,000 in Bonds.

Situation 1: Suppose stock market rises from 100 to 150. The value of shares of Mr. A's holding shall rise from ₹ 5,00,000 to ₹ 7,50,000 and value of portfolio shall jump to ₹ 12,50,000 and value of cushion to ₹ 7,50,000. Since the CPPI Policy requires the component of shares should go up to ₹ 10,00,000. This will necessitate the selling of bonds amounting ₹ 2,50,000 and re-investing proceeds in shares.

Situation 2: If stock market falls from 100 to 80, the value of shares of portfolio falls from ₹ 5,00,000 to ₹ 4,00,000 resulting in reduction of value of portfolio to ₹ 9,00,000 and cushion to ₹ 1,50,000. Since as per CPPI the share component should be ₹ 3,00,000 ($₹ 1,50,000 \times 2$), hence shares of ₹ 1,00,000 should be sold and invest in Bonds.

Thus from above it is clear that as per CPPI sell the shares as their prices fall and buy them as their prices rise. This policy is contrary to the Constant Mix Policy and hence pay-off of CPPI shall be convex as shown below:



(d) Comparative Evaluation

Basis	Buy & Hold Policy	Constant Mix Policy	Constant Proportion Portfolio Insurance
Pay-off Line	Straight	Concave	Convex
Protection in Down/Up Markets	Definite in Down market	Not much in Down market but relatively poor in Up market	Good in Down market and performs well in Up market
Performance in flat but fluctuating market	Performs between Constant and CPPI	Tend to do well in flat market.	Performs poorly.

11. Tax Efficient Strategies for Taxable Portfolios

Active portfolio managers especially need to consider taxes when deciding whether to sell or hold a stock whose value has increased. If a security is sold at a profit, capital gains are paid

7.50 Strategic Financial Management

and less is left in the portfolio to reinvest. A new security (the reinvestment security) needs to have a superior return sufficient to make up for these taxes. The size of the necessary return depends on the expected holding period and the cost basis (and amount of the capital gain) of the original security.

Some of the possible tax-efficient strategies for taxable portfolios are:

- Employ a buy-and-hold strategy since unrealized capital gains are not taxed.
- Loss harvesting, using tax losses to offset capital gains on other investments.
- Use options to help convert short-term capital gains into a long-term gain (with more favorable tax treatment).
- Tax-lot accounting for shares, specifying those with the highest cost basis for sale.
- For some investors, simply focus on growth stocks that will provide long-term gains rather than income from dividends.

12. Asset Allocation Strategies

Many portfolios containing equities also contain other asset categories, so the management factors are not limited to equities. There are four asset allocation strategies:

(a) Integrated Asset Allocation: Under this strategy, capital market conditions and investor objectives and constraints are examined and the allocation that best serves the investor's needs while incorporating the capital market forecast is determined.

(b) Strategic Asset Allocation: Under this strategy, optimal portfolio mixes based on returns, risk, and co-variances is generated using historical information and adjusted periodically to restore target allocation within the context of the investor's objectives and constraints.

(c) Tactical Asset Allocation: Under this strategy, investor's risk tolerance is assumed constant and the asset allocation is changed based on expectations about capital market conditions.

(d) Insured Asset Allocation: Under this strategy, risk exposure for changing portfolio values (wealth) is adjusted; more value means more ability to take risk.

13. Principles and Management of Hedge Funds

Hedge Fund is an aggressively managed portfolio of investments that uses advanced investment strategies such as leverage, long, short and derivative positions in both domestic and international markets with the goal of generating high returns (either in an absolute sense or over a specified market benchmark).

Legally, hedge funds are most often set up as private investment partnerships that are open to a limited number of investors and require a very large initial minimum investment. Investments in hedge funds are illiquid as they often require investors to keep their money in the fund for a minimum period of at least one year.

For the most part, hedge funds (unlike mutual funds) are unregulated because they cater to sophisticated investors. In the U.S., laws require that the majority of investors in the fund

be accredited. That is, they must earn a minimum amount of money annually and have a net worth of over \$1 million, along with a significant amount of investment knowledge. You can think of hedge funds as mutual funds for the super-rich. They are similar to mutual funds in that investments are pooled and professionally managed, but differ in that the fund has far more flexibility in its investment strategies.

The popular misconception regarding hedge funds is that all hedge funds are volatile- that they all use global macro strategies and place large directional bets on stocks, currencies, bonds, commodities, and gold, while using lots of leverage. In reality, less than 5% of hedge funds are global macro funds like Quantum, Tiger, and Strome. Most hedge funds use derivatives only for hedging or don't use derivatives at all, and many use no leverage.

It is important to note that hedging is actually the practice of attempting to reduce risk, but the goal of most hedge funds is to maximize return on investment. The name is mostly historical, as the first hedge funds tried to hedge against the downside risk of a bear market with their ability to short the market (mutual funds generally cannot enter into short positions as one of their primary goals). Nowadays, hedge funds use dozens of different strategies, so it isn't accurate to say that hedge funds just "hedge risk". In fact, because hedge fund managers make speculative investments, these funds can carry more risk than the overall market. A hedge fund is a fund that can take both long and short positions, use arbitrage, buy and sell undervalued securities, trade options or bonds, and invest in almost any opportunity in any market where it foresees impressive gains at reduced risk. Hedge fund strategies vary enormously - many hedge against downturns in the markets - especially important today with volatility and anticipation of corrections in overheated stock markets. The primary aim of most hedge funds is to reduce volatility and risk while attempting to preserve capital and deliver positive returns under all market conditions.

There are approximately 14 distinct investment strategies used by hedge funds, each offering different degrees of risk and return. A macro hedge fund, for example, invests in stock and bond markets and other investment opportunities, such as currencies, in hopes of profiting on significant shifts in such things as global interest rates and countries' economic policies. A macro hedge fund is more volatile but potentially faster growing than a distressed-securities hedge fund that buys the equity or debt of companies about to enter or exit financial distress. An equity hedge fund may be global or country specific, hedging against downturns in equity markets by shorting overvalued stocks or stock indexes. A relative value hedge fund takes advantage of price or spread inefficiencies. Knowing and understanding the characteristics of the many different hedge fund strategies is essential to capitalizing on their variety of investment opportunities.

It is important to understand the differences between the various hedge fund strategies because all hedge funds are not the same - investment returns, volatility, and risk vary enormously among the different hedge fund strategies. Some strategies which are not correlated to equity markets are able to deliver consistent returns with extremely low risk of loss, while others may be as or more volatile than mutual funds. A successful fund of funds recognizes these differences and blends various strategies and asset classes together to create more stable long-term investment returns than any of the individual funds.

7.52 Strategic Financial Management

- (a) Hedge fund strategies vary enormously – many, but not all, hedge against market downturns – especially important today with volatility and anticipation of corrections in overheated stock markets.
- (b) The primary aim of most hedge funds is to reduce volatility and risk while attempting to preserve capital and deliver positive (absolute) returns under all market conditions.
- (c) The popular misconception is that all hedge funds are volatile - that they all use global macro strategies and place large directional bets on stocks, currencies, bonds, commodities or gold, while using lots of leverage. In reality, less than 5% of hedge funds are global macro funds. Most hedge funds use derivatives only for hedging or don't use derivatives at all, and many use no leverage.

13.1 Main Features of Hedge funds: The key characteristics of hedge funds can be stated as follows:

- (a) Hedge funds utilize a variety of financial instruments to reduce risk, enhance returns and minimize the correlation with equity and bond markets. Many hedge funds are flexible in their investment options (can use short selling, leverage, derivatives such as puts, calls, options, futures, etc.).
- (b) Hedge funds vary enormously in terms of investment returns, volatility and risk. Many, but not all, hedge fund strategies tend to hedge against downturns in the markets being traded.
- (c) Many hedge funds have the ability to deliver non-market correlated returns.
- (d) Many hedge funds have as an objective consistency of returns and capital preservation rather than magnitude of returns.
- (e) Most hedge funds are managed by experienced investment professionals who are generally disciplined and diligent.
- (f) Pension funds, endowments, insurance companies, private banks and high net worth individuals and families invest in hedge funds to minimize overall portfolio volatility and enhance returns.
- (g) Most hedge fund managers are highly specialized and trade only within their area of expertise and competitive advantage.
- (h) Hedge funds benefit by heavily weighting hedge fund managers' remuneration towards performance incentives, thus attracting the best brains in the investment business. In addition, hedge fund managers usually have their own money invested in their fund.

13.2 Hedge Fund Industry Scenario of the World: The hedge funds industry around the world is estimated to be \$300-\$400 billion and is growing at about 20% per year with between 4,000 and 5,000 active hedge funds. It includes a variety of investment strategies, some of which use leverage and derivatives while others are more conservative and employ little or no leverage. Many hedge fund strategies seek to reduce market risk specifically by shorting equities or through the use of derivatives.

Most hedge funds are highly specialized, relying on the specific expertise of the manager or management team. Performance of many hedge fund strategies, particularly relative value

strategies, is not dependent on the direction of the bond or equity markets - unlike conventional equity or mutual funds (unit trusts), which are generally 100% exposed to market risk. Many hedge fund strategies, particularly arbitrage strategies, are limited as to how much capital they can successfully employ before returns diminish. As a result, many successful hedge fund managers limit the amount of capital they will accept. Hedge fund managers are generally highly professional, disciplined and diligent.

The returns of hedge funds over a sustained period of time have outperformed standard equity and bond indexes with less volatility and less risk of loss than equities. Beyond the averages, there are some truly outstanding performers. Investing in hedge funds tends to be favored by more sophisticated investors, including many Swiss and other private banks that have lived through, and understand the consequences of, major stock market corrections. An increasing number of endowments and pension funds allocate assets to hedge funds.

13.3 Hedging Strategies: Wide ranges of hedging strategies are available to hedge funds. For example:

- (i) *Selling Short:* Selling shares without owning them, hoping to buy them back at a future date at a lower price in the expectation that their price will drop.
- (ii) *Using Arbitrage:* Seeking to exploit pricing inefficiencies between related securities - for example, can be long convertible bonds and short the underlying issuer's equity.
- (iii) *Trading Options or Derivatives:* Contracts whose values are based on the performance of any underlying financial asset, index or other investment.
- (iv) *Investing in Anticipation of a Specific Event:* Merger transaction, hostile takeover, spin-off, exiting of bankruptcy proceedings, etc.
- (v) *Investing in Deeply Discounted Securities:* Of companies about to enter or exit financial distress or bankruptcy, often below liquidation value.
- (vi) Many of the strategies used by hedge funds benefit from being non-correlated to the direction of equity markets.

13.4 Benefits of Hedge Funds: There are many advantages of hedge funds. Some of the important advantages are:

- (a) Many hedge fund strategies have the ability to generate positive returns in both rising and falling equity and bond markets.
- (b) Inclusion of hedge funds in a balanced portfolio reduces overall portfolio risk and volatility and increases returns.
- (c) Huge variety of hedge fund investment styles – many uncorrelated with each other – provides investors with a wide choice of hedge fund strategies to meet their investment objectives. Academic research proves hedge funds have higher returns and lower overall risk than traditional investment funds.
- (d) Hedge funds provide an ideal long-term investment solution, eliminating the need to correctly time entry and exit from markets.
- (e) Adding hedge funds to an investment portfolio provides diversification not otherwise available in traditional investing.

13.5 Different Styles of Hedge Funds: The predictability of future results shows a strong correlation with the volatility of each strategy. Future performance of strategies with high volatility is far less predictable than future performance from strategies experiencing low or moderate volatility.

(a) Aggressive Growth: Invests in equities; expected to experience acceleration in growth of earnings per share; generally high P/E ratios, low or no dividends; often smaller and micro cap stocks which are expected to experience rapid growth. Includes sector specialist funds such as technology, banking, or biotechnology. Hedges by shorting equities where earnings disappointment is expected or by shorting stock indexes. Tends to be "long-biased." Expected volatility is high.

(b) Distressed Securities: Buys equity, debt, or trade claims at deep discounts of companies in or facing bankruptcy or reorganization. Profits from the market's lack of understanding of the true value of the deeply discounted securities and because the majority of institutional investors cannot own below investment grade securities. (This selling pressure creates the deep discount.) Results generally not dependent on the direction of the markets. Expected volatility ranges from Low – Moderate.

(c) Emerging Markets: Invests in equity or debt of emerging (less mature) markets that tend to have higher inflation and volatile growth. Short selling is not permitted in many emerging markets, and, therefore, effective hedging is often not available. Expected volatility is very high.

(d) Funds of Hedge Funds: Mix and match hedge funds and other pooled investment vehicles. This blending of different strategies and asset classes aims to provide a more stable long-term investment return than any of the individual funds. Returns, risk, and volatility can be controlled by the mix of underlying strategies and funds. Capital preservation is generally an important consideration. Volatility depends on the mix and ratio of strategies employed. Expected volatility range is Low - Moderate – High.

(e) Income: Invests with primary focus on yield or current income rather than solely on capital gains. May utilize leverage to buy bonds and sometimes fixed income derivatives in order to profit from principal appreciation and interest income. Expected volatility is low.

(f) Macro: Aims to profit from changes in global economies, typically brought about by shifts in government policy that impact interest rates, in turn affecting currency, stock, and bond markets. Participates in all major markets - equities, bonds, currencies and commodities - though not always at the same time. Uses leverage and derivatives to accentuate the impact of market moves. Utilizes hedging, but the leveraged directional investments tend to make the largest impact on performance. Expected volatility is very high.

(g) Market Neutral: Arbitrage: Attempts to hedge out most market risk by taking offsetting positions, often in different securities of the same issuer. For example, can be long convertible bonds and short the underlying issuers' equity. May also use futures to hedge out interest rate risk. Focuses on obtaining returns with low or no correlation to both the equity and bond markets. These relative value strategies include fixed income arbitrage, mortgage backed securities, capital structure arbitrage, and closed-end fund arbitrage. Expected volatility is low.

(h) **Market Neutral: Securities Hedging:** Invests equally in long and short equity portfolios generally in the same sectors of the market. Market risk is greatly reduced, but effective stock analysis and stock picking is essential to obtaining meaningful results. Leverage may be used to enhance returns. Usually low or no correlation to the market. Sometimes uses market index futures to hedge out systematic (market) risk. Relative benchmark index usually T-bills. Expected volatility is low.

(i) **Market Timing:** Allocates assets among different asset classes depending on the manager's view of the economic or market outlook. Portfolio emphasis may swing widely between asset classes. Unpredictability of market movements and the difficulty of timing entry and exit from markets add to the volatility of this strategy. Expected volatility is high.

(j) **Opportunistic:** Investment theme changes from strategy to strategy as opportunities arise to profit from events such as IPOs, sudden price changes often caused by an interim earnings disappointment, hostile bids, and other event-driven opportunities. May utilize several of these investing styles at a given time and is not restricted to any particular investment approach or asset class. Expected volatility is variable.

(k) **Multi Strategy:** Investment approach is diversified by employing various strategies simultaneously to realize short- and long-term gains. Other strategies may include systems trading such as trend following and various diversified technical strategies. This style of investing allows the manager to overweight or underweight different strategies to best capitalize on current investment opportunities. Expected volatility is variable.

(l) **Short Selling:** Sells securities short in anticipation of being able to re-purchase them at a future date at a lower price due to the manager's assessment of the overvaluation of the securities, or the market, or in anticipation of earnings disappointments often due to accounting irregularities, new competition, change of management, etc. Often used as a hedge to offset long-only portfolios and by those who feel the market is approaching a bearish cycle. Risk is high. Expected volatility is very high.

(m) **Special Situations:** Invests in event-driven situations such as mergers, hostile takeovers, reorganizations, or leveraged buyouts. May involve simultaneous purchase of stock in companies being acquired, and the sale of stock in its acquirer, hoping to profit from the spread between the current market price and the ultimate purchase price of the company. May also utilize derivatives to leverage returns and to hedge out interest rate and/or market risk. Results generally not dependent on direction of market. Expected volatility is moderate.

(n) **Value:** Invests in securities perceived to be selling at deep discounts to their intrinsic or potential worth. Such securities may be out of favor or under followed by analysts. Long-term holding, patience, and strong discipline are often required until the ultimate value is recognized by the market. Expected volatility is Low – Moderate.

13.6 Difference between Hedge Funds and Mutual Funds: Hedge funds are like mutual funds in two respects: (i) they are pooled investment vehicles (i.e. several investors entrust their money to a manager) and (ii) they invest in publicly traded securities. But there are important differences between a hedge fund and a mutual fund. These stem from and are

best understood in light of the hedge fund's charter: investors give hedge funds the freedom to pursue absolute return strategies.

Mutual Funds Seek Relative Returns: Most mutual funds invest in a predefined style, such as "small cap value", or into a particular sector, such as the Internet sector. To measure performance, the mutual fund's returns are compared to a style-specific index or benchmark. For example, if you buy into a "small cap value" fund, the managers of that fund may try to outperform the Nifty Small Cap Index. Less active managers might construct the portfolio by following the index and then applying stock-picking skills to increase (over-weigh) favoured stocks and decrease (under-weigh) less appealing stocks.

A mutual fund's goal is to beat the index or "beat the bogey", even if only modestly. If the index is down 10% while the mutual fund is down only 7%, the fund's performance would be called a success. On the passive-active spectrum, on which pure index investing is the passive extreme, mutual funds lie somewhere in the middle as they semi-actively aim to generate returns that are favourable compared to a benchmark.

Hedge Funds Actively Seek Absolute Returns: Hedge funds lie at the active end of the investing spectrum as they seek positive absolute returns, regardless of the performance of an index or sector benchmark. Unlike mutual funds, which are "long-only" (make only buy-sell decisions), a hedge fund engages in more aggressive strategies and positions, such as short selling, trading in derivative instruments like options and using leverage (borrowing) to enhance the risk/reward profile of their bets.

This activeness of hedge funds explains their popularity in bear markets. In a bull market, hedge funds may not perform as well as mutual funds, but in a bear market - taken as a group or asset class - they should do better than mutual funds because they hold short positions and hedges. The absolute return goals of hedge funds vary, but a goal might be stated as something like "6% to 9% annualized return regardless of the market conditions".

Investors, however, need to understand that the hedge-fund promise of pursuing absolute returns means hedge funds are "liberated" with respect to registration, investment positions, liquidity and fee structure. First, hedge funds in general are not registered with the authorities like in USA with SEC. They have been able to avoid registration by limiting the number of investors and requiring that their investors be accredited, which means they meet an income or net worth standard. Furthermore, hedge funds are prohibited from soliciting or advertising to a general audience, a prohibition that lends to their mystique.

In hedge funds, liquidity is a key concern for investors. Liquidity provisions vary, but invested funds may be difficult to withdraw "at will". For example, many funds have a lock-out period, which is an initial period of time during which investors cannot remove their money.

Lastly, hedge funds are more expensive even though a portion of the fees are performance-based. Typically, they charge an annual fee equal to 1% of assets managed (sometimes up to 2%), plus they receive a share - usually 20% - of the investment gains. The managers of many funds, however, invest their own money along with the other investors of the fund and, as such, may be said to "eat their own cooking".

13.7 Broad Categories of Hedge Funds: Most hedge funds are entrepreneurial organizations that employ proprietary or well-guarded strategies. The three broad hedge fund categories are based on the types of strategies they use:

(a) Arbitrage Strategies (Relative Value): Arbitrage is the exploitation of observable price inefficiency and, as such, pure arbitrage is considered risk less. Consider a very simple example. Say ABV stock currently trades at ₹ 910 and a single stock futures contract due in six months is priced at ₹ 914. The futures contract is a promise to buy or sell the stock at a predetermined price. So by purchasing the stock and simultaneously selling the futures contract, you can, without taking on any risk, lock in an ₹ 4 gain before transaction and borrowing costs. In practice, arbitrage is more complicated, but three trends in investing practices have opened up the possibility of all sorts of arbitrage strategies: the use of (1) derivative instruments, (2) trading software, and (3) various trading exchanges (for example, electronic communication networks and foreign exchanges make it possible to take advantage of "exchange arbitrage", the arbitraging of prices among different exchanges).

Only a few hedge funds are pure arbitrageurs, but when they are, historical studies often prove they are a good source of low-risk reliably-moderate returns. But, because observable price inefficiencies tend to be quite small, pure arbitrage requires large, usually leveraged investments and high turnover. Further, arbitrage is perishable and self-defeating: if a strategy is too successful, it gets duplicated and gradually disappears.

Most so-called arbitrage strategies are better labelled "relative value". These strategies do try to capitalize on price differences, but they are not risk free. For example, convertible arbitrage entails buying a corporate convertible bond, which can be converted into common shares, while simultaneously selling short the common stock of the same company that issued the bond. This strategy tries to exploit the relative prices of the convertible bond and the stock: the arbitrageur of this strategy would think the bond is a little cheap and the stock is a little expensive. The idea is to make money from the bond's yield if the stock goes up but also make money from the short sale if the stock goes down. However, as the convertible bond and the stock can move independently, the arbitrageur can lose on both the bond and the stock, which means the position carries risk.

(b) Event-Driven Strategies: Event-driven strategies take advantage of transaction announcements and other one-time events. One example is merger arbitrage, which is used in the event of an acquisition announcement and involves buying the stock of the target company and hedging the purchase by selling short the stock of the acquiring company. Usually at announcement, the purchase price that the acquiring company will pay to buy its target exceeds the current trading price of the target company. The merger arbitrageur bets the acquisition will happen and cause the target company's price to converge (rise) to the purchase price that the acquiring company pays. This also is not pure arbitrage. If the market happens to frown on the deal, the acquisition may unravel and send the stock of the acquirer up (in relief) and the target company's stock down (wiping out the temporary bump) which would cause a loss for the position.

There are various types of event-driven strategies. One other example is "distressed securities", which involves investing in companies that are re-organizing or have been unfairly

beaten down. Another interesting type of event-driven fund is the activist fund, which is predatory in nature. This type takes sizeable positions in small, flawed companies and then uses its ownership to force management changes or a restructuring of the balance sheet.

(c) Directional or Tactical Strategies: The largest group of hedge funds uses directional or tactical strategies. Macro funds are global, making "top-down" bets on currencies, interest rates, commodities or foreign economies. Because they are for "big picture" investors, macro funds often do not analyze individual companies.

Some other examples of directional or tactical strategies are:

- (i) Long/short strategies combine purchases (long positions) with short sales. For example, a long/short manager might purchase a portfolio of core stocks that occupy the S&P 500 and hedge by selling (shorting) S&P 500 Index futures. If the S&P 500 goes down, the short position will offset the losses in the core portfolio, limiting overall losses.
- (ii) Market neutral strategies are a specific type of long/short whose goal is to negate the impact and risk of general market movements, trying to isolate the pure returns of individual stocks. This type of strategy is a good example of how hedge funds can aim for positive, absolute returns even in a bear market. For example, a market neutral manager might purchase Birla company's and simultaneously short Tata company's, betting that the former will outperform the latter. The market could go down and both stocks could go down along with the market, but as long as Birla's outperforms Tata's, the short sale on Tata company's will produce a net profit for the position.
- (iii) Dedicated short strategies specialize in the short sale of over-valued securities. Because losses on short-only positions are theoretically unlimited (because the stock can rise indefinitely), these strategies are particularly risky. Some of these dedicated short funds are among the first to foresee corporate collapses - the managers of these funds can be particularly skilled at scrutinizing company fundamentals and financial statements in search of red flags.

13.8 Reasons for Investing in Hedge Funds: There are two basic reasons for investing in a hedge fund: to seek higher net returns (net of management and performance fees) and/or to seek diversification.

(a) Potential for Higher Returns, Especially in a Bear Market: Higher returns are hardly guaranteed. As discussed earlier, most hedge funds invest in the same securities available to mutual funds and individual investors. You can therefore only reasonably expect higher returns if you select a superior manager or pick a timely strategy. Many experts argue that selecting a talented manager is the only thing that really matters. This helps to explain why hedge fund strategies are not scalable, meaning bigger is not better. With mutual funds, an investment process can be replicated and taught to new managers, but many hedge funds are built around individual "stars", and genius is difficult to clone. For this reason, some of the better funds are likely to be small.

A timely strategy is also critical. The often cited statistics in international arena from CSFB/Tremont in regard to hedge fund performance during the 1990s are revealing. From January 1994 to September 2000 - a raging bull market by any definition - the passive S&P

500 index outperformed every major hedge fund strategy by a whopping 6% in annualized return. But particular strategies performed very differently. For example, dedicated short strategies suffered badly, but market neutral strategies outperformed the S&P 500 index in risk-adjusted terms (i.e. underperformed in annualized return but incurred less than one-fourth the risk). If your market outlook is bullish, you will need a specific reason to expect a hedge fund to beat the index. Conversely, if your outlook is bearish, hedge funds should be an attractive asset class compared to buy-and-hold or long-only mutual funds.

(b) Diversification Benefits: Many institutions invest in hedge funds for the diversification benefits. If you have a portfolio of investments, adding uncorrelated (and positive-returning) assets will reduce total portfolio risk. Hedge funds - because they employ derivatives, short sales or non-equity investments - tend to be uncorrelated with broad stock market indices. But again, correlation varies by strategy. Historical correlation data (e.g. over the 1990s) remains somewhat consistent and here is a reasonable hierarchy, as available from international scenario:



13.9 Demerits of Hedge Funds - Fat Tails are the Problem: Hedge fund investors are exposed to multiple risks, and each strategy has its own unique risks. For example, long/short funds are exposed to the short-squeeze.

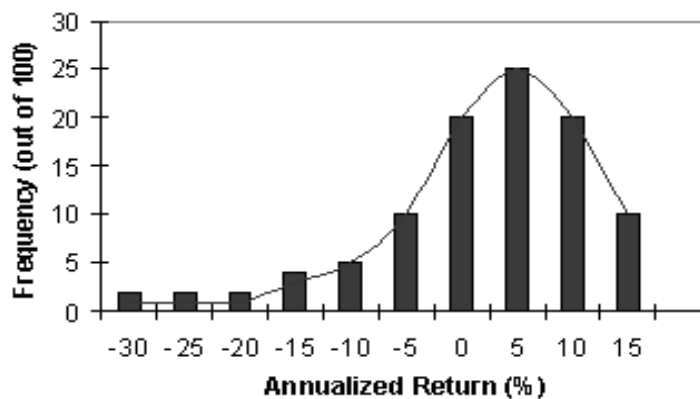
The traditional measure of risk is volatility, that is, the annualized standard deviation of returns. Surprisingly, most academic studies demonstrate that hedge funds, on average, are less volatile than the market. For example, over the bull market period we referred to earlier, volatility of the S&P 500 was about 14% while volatility of the aggregated hedge funds was only about 10%. That is, about two-thirds of the time, we might have expected returns to be within 10% of the average return. In risk-adjusted terms, as measured by the Sharpe ratio (unit of excess return per unit of risk), some strategies outperformed the S&P 500 index over the bull market period mentioned earlier.

The problem is that hedge fund returns do not follow the symmetrical return paths implied by traditional volatility. Instead, hedge fund returns tend to be skewed. Specifically, they tend to be negatively skewed, which means they bear the dreaded "fat tails", which are mostly

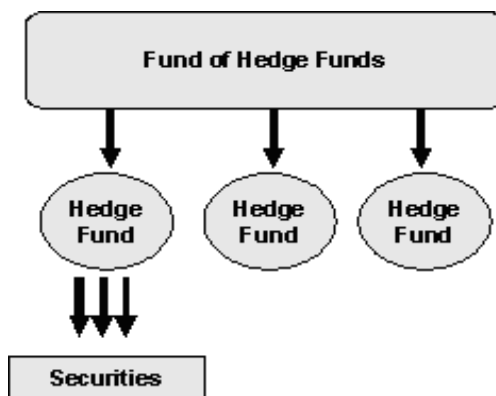
7.60 Strategic Financial Management

characterized by positive returns but a few cases of extreme losses. For this reason, measures of downside risk can be more useful than volatility or Sharpe ratio. Downside risk measures, such as value at risk (VaR), focus only on the left side of the return distribution curve where losses occur. They answer questions such as, "What are the odds that I lose 15% of the principal in one year?"

A Fat Tail Mean Small Odds of a Large Loss



13.10 Funds of Hedge Funds: Because investing in a single hedge fund requires time-consuming due diligence and concentrates risk, funds of hedge funds have become popular. These are pooled funds that allocate their capital among several hedge funds, usually in the neighborhood of 15 to 25 different hedge funds. Unlike the underlying hedge funds, these vehicles are often registered with the regulatory authorities like SEC in US and promoted to individual investors. Sometimes called a "retail" fund of funds, the net worth and income tests may be lower than usual.



The advantages of funds of hedge funds include automatic diversification, monitoring efficiency and selection expertise. Because these funds are invested in a minimum of around eight funds, the failure or underperformance of one hedge fund will not ruin the whole. As the funds of funds are supposed to monitor and conduct due diligence on their holdings, their investors should in theory be exposed only to reputable hedge funds. Finally, these funds of

hedge funds are often good at sourcing talented or undiscovered managers who may be "under the radar" of the broader investment community. In fact, the business model of the fund of funds hinges on identifying talented managers and pruning the portfolio of underperforming managers.

The biggest disadvantage is cost, because these funds create a double-fee structure. Typically, you pay a management fee (and maybe even a performance fee) to the fund manager in addition to fees normally paid to the underlying hedge funds. Arrangements vary, but you might pay a 1% management fee to both the fund of funds and the underlying hedge funds. In regards to performance fees, the underlying hedge funds may charge 20% of their profits, and it is not unusual for the fund of funds to charge an additional 10%. Under this typical arrangement, you would pay 2% annually plus 30% of the gains. This makes cost a serious issue, even though the 2% management fee by itself is only about 50 basis points higher than the average small cap mutual fund (i.e. about 1.5%).

Another important and underestimated risk is the potential for over-diversification. A fund of hedge funds needs to coordinate its holdings or it will not add value: if it is not careful, it may inadvertently collect a group of hedge funds that duplicates its various holdings or - even worse - ends up constituting a representative sample of the entire market. Too many single hedge fund holdings (with the aim of diversification) are likely to erode the benefits of active management, while incurring the double-fee structure in the meantime. Various studies have been conducted, but the "sweet spot" seems to be around eight to 15 hedge funds.

14. International Portfolio Management

The objective of portfolio investment management is to consider an optimal portfolio where the risk-return trade off is optimal. The return may be maximum at a certain level of risk or the risk may be minimum at a certain level of return. It is therefore necessary to determine whether optimization of international portfolio can be achieved by striking a balance between risk and return.

14.1 Expected Returns from a Security: For international investment, the estimation of expected returns takes into consideration the changes in exchange rate too so that the return from a security abroad in terms of home-country currency takes the following form:

$$1 + R_{HC} = [1 + (S_1 - S_0 + I) / S_0] \times 1 + e$$

Where,

S_0 = Home country currency value of security during proceeding time period t_0

S_1 = Home country currency value of security during succeeding time period t_1

I = Income from interest and dividend

e = Change in exchange rate

Illustration 10

An Indian investor invests in a bond in America. If the price of the bond in the beginning of the period is \$ 100 and it is \$ 105 at the end of the period. The coupon interest during the period is \$ 7. The US

7.62 Strategic Financial Management

dollar appreciates during this period by 3%. Find the return on investment in terms of home country currency.

Solution

$$\begin{aligned}R_{HC} &= [1 + (105 - 100 + 7)/100] (1 + 0.03) - 1 \\&= (1.12) (1.03) - 1 \\&= 1.1536 - 1 = .1536 \\&= 15.36\%\end{aligned}$$

14.2 Portfolio Return: Portfolio return is the weighted average of the expected return from different securities comprising the portfolio. The portfolio for a two security portfolio will be:

$$R_P = R_A W_A + R_B W_B$$

Where,

R_P = Portfolio Return

R_A and R_B = Portfolio Returns for securities A and B

W_A and W_B = Weighted average of the securities comprising the portfolio.

14.3 Reduction of Risk through Diversification: The investor can reduce the portfolio risk through diversification. Diversification is simultaneous investment in other securities within or outside the home country. Risk may be reduced by diversification if the covariance/correlation between the existing portfolio and the new portfolio is negative i.e. returns in one basket are increasing while in the other they are falling. On the other hand, if it is positive it will signify that returns in one set are increasing while in the other also they are increasing leading to the level of risk being raised through diversification. Thus diversification becomes a futile exercise. With covariance being ≥ 0 , the returns from two sets of investment are not correlated or are positively correlated.

Covariance between two sets of returns A_1 , and A_2 is given by:

$$\text{Cov}(A_1, A_2) = P_1(A_1 - \bar{A}) (A_2 - \bar{A}) + P_2 (A_1 - \bar{A}) (A_2 - \bar{A})$$

$$\text{Correlation Coefficient } \rho_{12} = \frac{\text{Cov}(A_1, A_2)}{\sigma_1 \sigma_2}$$

Covariance is sensitive to different sets of measurement and takes any value while Correlation Coefficient removes the sensitivity and lies between -1 and + 1

The Portfolio Risk of both the existing and new portfolio in terms of standard deviation is obtained from:

$$\sigma_p = \left[w_1^2 \text{Var } A_1 + w_2^2 \text{Var } A_2 + 2(w_1)(w_2)\text{Cov}(A_1, A_2) \right]^{\frac{1}{2}}$$

Where,

w_1, w_2 represent the weights of the different sets of portfolio in the total investment.

Illustration 11

An Indian investor invests in American and British securities in the proportion of 75% and 25%. The expected return is 15% from the former and 12% from the latter. The risk manifesting in variance is 15% in US securities and 18% in UK securities. Correlation is 0.6. Determine the Portfolio Return and Portfolio risk.

Solution

Portfolio Return

$$0.75 \times 0.15 + 0.25 \times 0.12 = 0.1425 = 14.25\%$$

Portfolio Risk

$$\begin{aligned} & (0.75)^2 (0.15)^2 + (0.25)^2 (0.18)^2 + 2(0.75)(0.25)(0.15)(0.18)(0.6) \\ & = \sqrt{0.020756} \\ & = 0.1441 = 14.41\% \end{aligned}$$

14.4 Benefits of International Portfolio Management: International Diversification of portfolio of assets helps to obtain higher risk adjusted returns i.e. reduce risk and raise return through international investment. Some of the benefits are listed as under:

(a) Reduce Risk: International investment aids to diversify risk. The different sectors in an individual economy in some way or the other are interrelated and as a whole subject to the same impact of the entire domestic policy. The returns on investment in a domestic economy depend on the prospects of domestic activity together with the uncertainty attached thereto. The gains from diversification within a country are therefore very much limited.

Though macro economic factors of different countries vary widely and do not follow the same phases of business cycles, different countries have securities of different industries in their market portfolio leading to correlation of expected returns from investment in different countries being lower than in a single country. Thus foreign investment provides diversification benefits which a domestic investment does not.

(b) Raise Return through better Risk – Return Trade off: International Investment aids to raise the return with a given risk and/or aids to lower the risk with a given rate of return. This is possible due to profitable investment opportunities being available in an enlarged situation and at the same time inter country dissimilarities reduce the quantum of risk. With a gradual increase in foreign portfolio returns from investment also increases till the ratio of foreign portfolio reaches 60% of the total portfolio.

15. Estimating the Project Discount Rate

The CAPM can also be used to calculate WACC used as the discount rate to compute NPV of the firm. Normally there is an underlying assumption that the project has the same business and financial risk as that of the parent company. However, WACC of the firm can be applied only when the project is a carbon copy of the firm's assets. However it may be possible that, the project may have a different operating risk profile and more or less leveraged than the parent has. In such a case it will be wrong to apply the firm's WACC as the discount rate.

7.64 Strategic Financial Management

CAPM can be used to arrive at the project discount rate by taking the following steps:

1. Estimate the project beta.
2. Putting the value of Beta computed above into the Capital Asset Pricing Model (CAPM) to arrive at the cost of equity.
3. Estimate the cost of debt.
4. Calculate the WACC for the project.

Pure Play Technique: To compute the Beta of project the technique known as 'Pure Play' can be used. As it is difficult to compute the beta for the project in the marketplace, a proxy beta derived from a publicly-traded firm whose operations are as similar as possible to the project in question can be used as the measure of the project's systematic risk. This technique attempts to identify firms with publicly-traded securities, which are engaged solely in the same line of business as the division or project. These comparable firms are called 'pureplay' firm and should have the following characteristics.

1. The firm should have only one business line and no miscellaneous revenues.
2. The pureplay should be in the same industry or business line as the division in question.
3. The revenues of the pureplay should be approximately the same as those of the division under consideration.
4. When more than one firm could be identified as potential pureplay, the firm with the median beta could be chosen as the pureplay. Otherwise mean of beta of these firms can also be used.

Once the proxy betas are obtained, next step involves the estimation of the unlevered betas for each of these firms. The basic purpose of this exercise is to remove the effect of capital structure on beta as unlevered beta reflects only the operating risk.

The relationship between levered and unlevered beta is as follows:

$$\beta_L = \beta_U [1 + (1 - T) D / E]$$

or

$$\beta_U = \frac{\beta_L}{[1 + (1 - T) D / E]}$$

The next step shall involve the re-levering the project beta reflecting the project's financing mix using above formula,

$$\beta_L = \beta_U [1 + (1 - T) D / E]$$

This technique can be understood with the help of following illustration.

Illustration 12

The XYZ Ltd. in the manufacturing business is planning to set up an software development company. The project will have a D/E ratio of 0.27. The company has identified following four pureplay firms in the line of software business.

Pureplay firm	β_L	D / E
ABC	1.1	0.3
DEF	0.9	0.25
GHI	0.95	0.35
JKL	1.0	0.3

Assuming tax rate applicable to XYZ Ltd. as 35 per cent, R_f as 12%, K_d as 14% and R_M as 18%, you are required to compute the WACC to be used to compute NPV of the project.

Solution

First of all we shall unlever the beta of the pureplay firms as follows:

$$\beta_U = \frac{\beta_L}{[1 + (1 - T) D / E]}$$

Firm	Unlevered Beta
ABC	$\frac{1.1}{1 + (0.65) (0.3)} = 0.921$
DEF	$\frac{0.9}{1 + (0.65) (0.25)} = 0.774$
GHI	$\frac{0.95}{1 + (0.65) (0.35)} = 0.774$
JKL	$\frac{1.0}{1 + (0.65) (0.3)} = 0.837$

$$\text{Average } \beta_U = \frac{0.921+0.774+0.774+0.837}{4} = 0.827$$

This can be taken as proxy for unlevered beta of the project.

Next, we shall lever the beta for the project as follows:

$$\begin{aligned} \beta_L &= \beta_U [1 + (1 - T) D / E] \\ &= 0.827 [1 + (0.65) (0.27)] = 0.97 \end{aligned}$$

Since $R_f = 12\%$ and $R_M = 18\%$ per cent

Cost of equity for the project will be:

$$\begin{aligned} &= R_f + \beta_L [E(R_M) - R_f] \\ &= 12\% + 0.97 [18\% - 12\%] = 17.82\% \end{aligned}$$

The project's WACC (K_o) will be:

$$K_o = \frac{D}{V} K_d(1 - T) + \frac{E}{V} K_e$$

7.66 Strategic Financial Management

$$K_o = \frac{0.27}{1.27} \times 0.14(1 - 0.35) + \frac{1.00}{1.27} \times 0.1782 = 0.1597$$

$$K_o = 15.97\%$$

The project's WACC (K_o) i.e. 15.97% can be used to calculate to discount the project.

16. Random Walk Theory

While discussing the Dow Jones theory, we have seen that the theory is based on the assumption that the behaviour of stock market itself contains trends which give clues to the future behaviour of stock market prices. Thus supporters of the theory argue that market prices can be predicted if their patterns can be properly understood. *Such analysis of stock market patterns is called technical analysis.* Apart from this theory there are many approaches to technical analysis. Most of them, however, involve a good deal of subjective judgment.

Many investment managers and stock market analysts believe that stock market prices can never be predicted because they are not a result of any underlying factors but are mere statistical ups and downs. This hypothesis is known as Random Walk hypothesis which states that the behaviour of stock market prices is unpredictable and that there is no relationship between the present prices of the shares and their future prices. Proponents of this hypothesis argue that stock market prices are independent. A British statistician, M. G. Kendall, found that changes in security prices behave nearly as if they are generated by a suitably designed roulette wheel for which each outcome is statistically independent of the past history. In other words, the fact that there are peaks and troughs in stock exchange prices is a mere statistical happening – successive peaks and troughs are unconnected. In the layman's language it may be said that prices on the stock exchange behave exactly the way a drunk would behave while walking in a blind lane, i.e., up and down, with an unsteady way going in any direction he likes, bending on the side once and on the other side the second time.

The supporters of this theory put out a simple argument. It follows that:

- (a) Prices of shares in stock market can never be predicted.
- (b) The reason is that the price trends are not the result of any underlying factors, but that they represent a statistical expression of past data.
- (c) There may be periodical ups or downs in share prices, but no connection can be established between two successive peaks (high price of stocks) and troughs (low price of stocks).

17. Efficient Market Theory (Efficient Market Hypothesis)

Efficient Market Theory was developed by University of Chicago professor Eugen Fama in the 1960s. As per this theory, at any given time, all available price sensitive information is fully reflected in securities' prices. Thus this theory implies that no investor can consistently outperform the market as every stock is appropriately priced based on available information.

Stating otherwise theory states that no one can "beat the market" hence making it impossible for investors to either purchase undervalued stocks or sell stocks for inflated prices as stocks are always traded at their fair value on stock exchanges. Hence it is impossible to outperform

the overall market through expert stock selection or market timing and that the only way an investor can possibly obtain higher returns is by purchasing riskier investments.

17.1 Search for Theory: When empirical evidence in favour of Random walk hypothesis seemed overwhelming, researchers wanted to know about the Economic processes that produced a Random walk. They concluded that randomness of stock price was a result of efficient market that led to the following view points:

- Information is freely and instantaneously available to all market participants.
- Keen competition among the market participants more or less ensures that market will reflect intrinsic values. This means that they will fully impound all available information.
- Price change only response to new information that is unrelated to previous information and therefore unpredictable.

17.2 Misconception about Efficient Market Theory: Efficient Market Theory implies that market prices factor in all available information and as such it is not possible for any investor to earn consistent long term returns from market operations.

Although price tends to fluctuate they cannot reflect fair value. This is because the future is uncertain. The market springs surprises continually and as prices reflect the surprises they fluctuate.

Inability of institutional portfolio managers to achieve superior investment performance implies that they lack competence in an efficient market. It is not possible to achieve superior investment performance since market efficiency exists due to portfolio mangers doing this job well in a competitive setting.

The random movement of stock prices suggests that stock market is irrational. Randomness and irrationality are two different things, if investors are rational and competitive, price changes are bound to be random.

17.3 Level of Market Efficiency: That price reflects all available information, the highest order of market efficiency. According to FAMA, there exist three levels of market efficiency: -

- (i) *Weak form efficiency* – Price reflect all information found in the record of past prices and volumes.
- (ii) *Semi – Strong efficiency* – Price reflect not only all information found in the record of past prices and volumes but also all other publicly available information.
- (iii) *Strong form efficiency* – Price reflect all available information public as well as private.

17.4 Empirical Evidence on Weak form Efficient Market Theory: According to the Weak form Efficient Market Theory current price of a stock reflect all information found in the record of past prices and volumes. This means that there is no relationship between the past and future price movements.

Three types of tests have been employed to empirically verify the weak form of Efficient Market Theory- Serial Correlation Test, Run Test and Filter Rule Test.

(a) *Serial Correlation Test*: To test for randomness in stock price changes, one has to look at serial correlation. For this purpose, price change in one period has to be correlated with price change in some other period. Price changes are considered to be serially independent. Serial correlation studies employing different stocks, different time lags and different time period have been conducted to detect serial correlation but no significant serial correlation could be discovered. These studies were carried on short term trends viz. daily, weekly, fortnightly and monthly and not in long term trends in stock prices as in such cases. Stock prices tend to move upwards.

(b) *Run Test*: Given a series of stock price changes each price change is designated + if it represents an increase and – if it represents a decrease. The resulting series may be -, +, -, -, -, +, +.

A run occurs when there is no difference between the sign of two changes. When the sign of change differs, the run ends and new run begins.

$\frac{+}{1} \frac{+}{2} / \frac{---}{3} / \frac{+}{4} / \frac{-}{5} / \frac{+}{6} / \frac{---}{1} / \frac{+}{2} / \frac{-}{3} / \frac{+}{4} / \frac{-}{5} / \frac{-}{6}$

To test a series of price change for independence, the number of runs in that series is compared with a number of runs in a purely random series of the size and in the process determines whether it is statistically different. By and large, the result of these studies strongly supports the Random Walk Model.

(c) *Filter Rules Test*: If the price of stock increases by at least N% buy and hold it until its price decreases by at least N% from a subsequent high. When the price decreases at least N% or more, sell it. If the behaviour of stock price changes is random, filter rules should not apply in such a buy and hold strategy. By and large, studies suggest that filter rules do not outperform a single buy and hold strategy particular after considering commission on transaction.

17.5 Empirical Evidence on Semi-strong Efficient Market Theory: Semi-strong form efficient market theory holds that stock prices adjust rapidly to all publicly available information. By using publicly available information, investors will not be able to earn above normal rates of return after considering the risk factor. To test semi-strong form efficient market theory, a number of studies was conducted which lead to the following queries: Whether it was possible to earn on the above normal rate of return after adjustment for risk, using only publicly available information and how rapidly prices adjust to public announcement with regard to earnings, dividends, mergers, acquisitions, stock-splits?

Several studies support the Semi-strong form Efficient Market Theory. Fama, Fisher, Jensen and Roll in their adjustment of stock prices to new information examined the effect of stock split on return of 940 stock splits in New York Stock Exchange during the period 1957-1959. They found that prior to the split, stock earns higher returns than predicted by any market model.

Boll and Brown in an empirical evaluation of accounting income numbers studied the effect of annual earnings announcements. They divided the firms into two groups. First group consisted of firms whose earnings increased in relation to the average corporate earnings while second

group consists of firms whose earnings decreased in relation to the average corporate earnings. They found that before the announcement of earnings, stock in the first group earned positive abnormal returns while stock in the second group earned negative abnormal returns after the announcement of earnings. Stock in both the groups earned normal returns.

There have been studies which have been empirically documented showing the following inefficiencies and anomalies:

- Stock price adjust gradually not rapidly to announcements of unanticipated changes in quarterly earnings.
- Small firms' portfolio seemed to outperform large firms' portfolio.
- Low price earning multiple stock tend to outperform large price earning multiple stock.
- Monday's return is lower than return for the other days of the week.

17.6 Empirical Evidence on Strong form Efficient Market Theory: According to the Efficient Market Theory, all available information, public or private, is reflected in the stock prices. This represents an extreme hypothesis.

To test this theory, the researcher analysed returns earned by certain groups viz. corporate insiders, specialists on stock exchanges, mutual fund managers who have access to internal information (not publicly available), or possess greater resource or ability to intensively analyse information in the public domain. They suggested that corporate insiders (having access to internal information) and stock exchange specialists (having monopolistic exposure) earn superior rate of return after adjustment of risk.

Mutual Fund managers do not on an average earn a superior rate of return. No scientific evidence has been formulated to indicate that investment performance of professionally managed portfolios as a group has been any better than that of randomly selected portfolios. This was the finding of Burton Malkiel in his Random Walk Down Wall Street, New York.

17.7 Challenges to the Efficient Market Theory: Information inadequacy – Information is neither freely available nor rapidly transmitted to all participants in the stock market. There is a calculated attempt by many companies to circulate misinformation.

(a) Limited information processing capabilities – Human information processing capabilities are sharply limited. According to Herbert Simon every human organism lives in an environment which generates millions of new bits of information every second but the bottle necks of the perceptual apparatus does not admit more than thousand bits per seconds and possibly much less.

David Dreman maintained that under conditions of anxiety and uncertainty, with a vast interacting information grid, the market can become a giant.

(b) Irrational Behaviour – It is generally believed that investors' rationality will ensure a close correspondence between market prices and intrinsic values. But in practice this is not true. J. M. Keynes argued that all sorts of consideration enter into the market valuation which is in no way relevant to the prospective yield. This was confirmed by L. C. Gupta who found that the market evaluation processes work haphazardly almost like a blind man firing a gun.

7.70 Strategic Financial Management

The market seems to function largely on hit or miss tactics rather than on the basis of informed beliefs about the long term prospects of individual enterprises.

(c) Monopolistic Influence – A market is regarded as highly competitive. No single buyer or seller is supposed to have undue influence over prices. In practice, powerful institutions and big operators wield great influence over the market. The monopolistic power enjoyed by them diminishes the competitiveness of the market.

Financial Services in India

Learning Objectives

After going through the chapter student shall be able to understand

- **Investment Banking**
 - (1) Main Players
 - (2) Main Areas
 - Corporate Finance
 - Sales
 - Trading
 - Research
 - Syndicate
 - (3) Commercial Banking vs. Investment Banking
 - (4) Details of some functions of an Investment Bank
 - M&A
 - Private Placements
 - Financial Restructurings
- **Credit Rating**
 - (1) Credit Rating Agencies in India
 - (2) Credit Rating Process
 - (3) Uses of Credit Rating
 - (4) Limitations of Credit Rating
 - (5) CAMEL Model in Credit Rating
 - (6) Credit Rating Agencies and the US sub-prime crisis
- **Consumer Finance**
 - (1) Purpose behind Consumer Finance
 - (2) Structure of Loans
 - (3) Basis of Credit Evaluation

8.2 Strategic Financial Management

- (4) Some Concepts
- (5) Regulation of Consumer Finance
- **Factoring**
 - (1) Types/ Forms of Factoring
 - (2) Functions of a Factor
 - (3) Forfaiting
 - (4) Difference between Forfaiting and Export Factoring
- **Housing Finance**
 - (1) Regulatory Framework
 - (2) Loan Structure and Interest Rates
- **Asset Restructuring/Management Company**
- **Depository Services**
 - (1) Physical vis-à-vis Dematerialised Share Trading
 - (2) Depositories in India
 - (3) Pros and Cons of Depository Services
 - (4) Functioning of Depository Services
- **Debit Cards**
 - (1) Difference between a Debit Card and a Credit Card
 - (2) Benefits of Debit Cards
- **Online Share Trading**

1. Investment Banking

An investment bank is basically a financial intermediary between the issuer and the investor of securities. Its primary task is to sell securities on behalf of a company and underwrites the issue of new equity shares to raise the necessary capital for the company.

In order to expand their businesses, companies need money. The company does this by selling their securities to investors. Investment bankers help the corporates in this respect. So, we can say that investment bankers are basically financial intermediaries who help their clients in raising capital either by underwriting their shares or bonds or by acting as an agent in the issuance of securities.

Further, it has to be noted that Investment banking isn't a specific function. It is a term used for a range of activities including underwriting, selling and trading securities; providing financial advisory services, such as mergers and acquisition advice; divestitures, private equity syndication, IPO advisory and managing assets.

1.1 The main players in Investment Banking: The biggest investment banks in global scenario include Goldman Sachs, Bank of America Merrill Lynch, Morgan Stanley, Salomon Smith Barney, Donaldson, Lufkin & Jenrette, Credit Suisse, Deutsche Bank, Citi, Barclays Capital, and J.P. Morgan among others.

1.2 Main areas of Investment Banking: Generally, the breakdown of an investment bank includes the following areas:

1.2.1 Corporate Finance: The corporate finance, generally perform two different functions:

- (i) Mergers and acquisitions advisory and
- (ii) Underwriting.

(i) Mergers and acquisitions advisory: Under this aspect of corporate finance, investment banking help in negotiating and structuring a merger deal between two companies. For instance, if a company wants to buy another company, it may take the help of an investment banker who will assist in finalizing the purchase price by coordinating with the bidders, performing due diligence, structuring the deal, negotiating with the merger target and generally ensuring a smooth transaction.

Moreover, mergers and acquisition advisory includes buy side and sell side advisory. However, sell side advisory holds the key because Investment Banker helps in placing the stocks and bonds in the public platform and sell these to investors. This selling aspect helps the companies to generate funds and consequently assists in expanding the corporate finance division of investment banking.

(ii) Underwriting: Under the underwriting function, underwriters help their client companies in raising the required funds for the company. Whenever, a corporate wants to raise capital, it takes the help of underwriters who purchase the unsubscribed portion not taken by the investors. Underwriting can be done either through negotiations between underwriter and the issuing company (called negotiated underwriting) or by competitive bidding. A negotiated underwriting is a negotiated agreed arrangement between the issuing firm and its investment banker. Most large corporations work with investment bankers with whom they have long-term relationship. In competitive bidding, the firm awards offering to investment banker that bid the highest price.

1.2.2 Sales: Sales is an important part of any investment bank. The main task of the sales force of an Investment bank is to enable high net worth individuals and institutions to take orders from them. They make money through commissions received from their clients.

They make buy and sell recommendations. For example, if the share price of ABC Ltd. is on the higher side, the sales guy of the investment bank will recommend buying the shares of that company.

1.2.3 Trading: Trading plays an important part for the investment bankers. Clients order is communicated to the trading people by the sales people. Traders help their client in buying and selling of shares, bonds, currencies etc. It also helps them in executing a trade.

8.4 Strategic Financial Management

Traders tackle all type of transaction, big or small and provide liquidity to the market. They generally make money by purchasing securities at lower price and selling them at a higher price.

Sales force of an Investment bank and traders also delve into propriety trading. Propriety trading is a form of trading in which the traders trades in stocks, bonds, derivatives in its own account using their own money. They do not touch client's account. The main advantage of this form of trading is that the traders can take the entire profit from the investment made. Otherwise, in other forms of trading they have to depend upon commission from their clients. The chances of making excess profits in this form of trading are much higher since the traders have the necessary expertise which an average investor doesn't have.

In case of IPOs and follow-on offers, an investment bank's sales and trading department keeps the communication channel open with the corporate finance department of the company. Generally, it is the responsibility of the sales and trading department of the investment banks to build books for a particular stock. After that, on the date of offering, they fixed the price of the shares and start selling the new shares to their customers.

1.2.4 Research: Research analysts analyses the stock and bonds of various stocks and recommend whether to buy, hold and sell those securities. The job of research analyst is to review the company and wrote a report on the prospectus of a company and gives a buy and sells rating. Some research analyst focuses on equity while some give its attention to fixed income securities such as bonds.

Actually, research activity by itself does not generate a lot of income. The recommendation of research workers influences the buying and selling of securities of a company. Because of this, the sales and trading people earns more fees. So, reputable research analyst are a very important part of an investment banking team as they help them in increasing their business and earn a hefty income.

1.2.5 Syndicate: It provides a vital link between sales persons and corporate finance people. Syndicates also work as a group in case of large or risky issues. A syndicate is a temporary association of investment bankers brought together for the purpose of selling new securities.

An important job of the syndicate is to act as an underwriter. There are two types of underwriting syndicates, divided and undivided. In a divided syndicate, every member is obliged to sell a portion of his assigned offerings. While in case of undivided syndicate, every member is obliged to sell the unsold portion of his fixed participation in securities. It doesn't matter that how many securities have actually been sold by the group.

1.3 Commercial Banking vs. Investment Banking: In spite of sharing many aspects, commercial banking and investment banking contains some fundamental differences. After a quick overview of commercial banking, we will build up to a full discussion of what investment banking entails.

1.3.1 Commercial Banks: The job of commercial banks is pretty simple. They take deposits from the customers and then lend that deposited amount to consumers. If one wants to borrow money to buy a house, car, or for any of his personal purposes, he will approach a

commercial bank. Also, the companies that borrow from commercial banks range from a small shopkeeper to a large multinational company.

If anyone wants to take loans from banks, they contact them and enter into a legal contract. Generally, a negotiation takes place in which the banks pursue their customers individually to determine the terms of the loans, including the time to maturity and the interest rates to be charged.

1.3.2 Investment Banks: The functioning of investment bank is different from a commercial bank. An investment bank does not lend from its cash reserve of deposits accepted from its customers as does a commercial bank. In fact, an investment bank acts as an intermediary and undertakes the matching of buyers and sellers of stocks and bonds.

However, the main purpose of companies to utilize the services of commercial banks and investment banks are the same. Whenever, the companies need funds, they contact the commercial banks for loan or an investment bank to sell their stocks or bonds. However, the investment banks have to comparatively work harder and spent sufficient time to find investors so that it's client company can get the required capital.

Investment banks typically sell public securities as opposed to private loan agreements initiated by commercial banks. Technically, for example, securities such as stock of TCS or Mahindra and Mahindra Financial Services AAA bonds, represent a high degree of safety and are traded either on a public exchange or through an approved dealer. The dealer is the investment bank.

The investment bank makes money by charging the client a small percentage of the transaction upon its completion. This is generally called "underwriting discount." However, a commercial bank making a loan actually receives interest on the money lent by it.

Thus the fundamental differences between an investment bank and a commercial bank can be outlined as follows:

Investment Banks	Commercial Banks
1. Investment Banks help their clients in raising capital by acting as an intermediary between the buyers and the sellers of securities	1. Commercial Banks accept deposits from customers and lend money to individuals and corporates
2. Investment Banks do not take deposits from customers	2. Commercial banks can take deposits from customers.
3. The Investment Banks do not own the securities and only act as an intermediary for smooth transaction of buying and selling securities.	3. Commercial Banks have the ownership of loans granted to their customers.
4. Investment Banks earn underwriting commission	4. Commercial banks earn interest on loans granted to their customers.

1.4 Details of Some of the Functions of Investment Banks

1.4.1 Issue of IPO: Companies in need of funds resort to Initial public offering (IPO). This is the phase when securities are issued to the public for the first time. After the initial public offering, securities are listed on the stock exchange and sale and purchase of those listed securities can take place. The task of investment bankers in this regard is to underwrite the public issue by charging some commission.

Further, commercial banks have also developed expertise in underwriting public bond deals. So, commercial banks not only lend money by utilizing depositor's money but also they underwrite bonds through their corporate finance department. So, the commercial banks have directly competed with investment banks for this business of bond underwriting. But, in reality, only a handful of big commercial banks are able to compete in this business with the investment banks that generally have a larger share of the pie.

From the perspective of an investment banker, the IPO process consists of these three major phases: hiring the managers, due diligence, and marketing.

1.4.2 Hiring the Managers: Before going for a public issue, the first task that the company does is to hire a merchant banker for the issue which is also called a manager to the issue. The selection process depends upon the investment banker's general goodwill, expertise as well as the quality of its research coverage in the company's specific industry. The selection also depends on whether the issuer would like to see its securities held more by individuals or by institutional investors. Almost all IPO candidates select two or more investment banks to manage the IPO process.

When there is more than one investment bank, one among them is selected as the lead or book-running manager. The lead manager almost always appears on the left cover of the prospectus, and it plays a major role throughout the transaction. The task of the manager is to make all arrangements with the issuer, make the schedule of the issue and fulfills all the requirements of the due diligence process. He is also responsible for the pricing and distribution of the stock.

1.4.3 Due Diligence and Drafting: Once managers are selected, the second phase of the process begins. For investment bankers on the deal, this phase involves understanding the company's business as well as possible scenarios (called due diligence), and then filing the legal documents as required by the SEBI.

The merchant banker would be closely associated in preparing the new applicant's prospectus and other related listing documents. The Merchant Banker shall conduct a due diligence on the applicant and provide due diligence certificate as per Form A of Schedule VI of the ICDR including additional confirmations as provided in Form H of Schedule VI along with the offer document to the exchange. The other certifications as mentioned in ICDR, Schedule VI will be provided, if applicable. [Source: www.nseindia.com]

1.4.4 Follow-on offering of stock: Sometimes an already listed company issue shares to the public again. This is called a Further Public Offer or follow-on offering. The main reason for a company to go through this offer is that – it is growing rapidly and it needs funds for that.

1.4.5 Issue of Debt: Sometimes, the company instead of choosing equity for their funding requirements chooses public debt.

The reasons for issuing bonds rather than stock are explained as follows:

- a) When the stock price of the company is down, a bond issue is a better alternative.
- b) The firm does not want to dilute its existing shareholding by issuing more equity.

These are both valid reasons for issuing bonds rather than equity.

Further, in case the economy is not doing well investors generally avoid the share issue and in such cases issuance of bonds may be resorted to satisfy the company's appetite for funds.

In case of a bond issue, the focus of the prospectus is on highlighting the importance of the company's stability and steady cash flow. On the other hand, a share issue prospectus will highlight the company's growth and expansion opportunities.

In case of a debt issue, the importance of a bond's credit rating cannot be undermined. It is necessary to obtain a good credit rating from a reputed credit rating agency like CRISIL, ICRA, CARE etc. So, better credit rating gives an impression that the bond is safer. In order to encourage investors to receive lower rate of interest, the credit rating of debt issue should be high.

1.5 M&A: M&A advisors come directly under the corporate finance departments of investment banks. As in the case of public offerings, merger and acquisition transactions do not directly involve salespeople, traders or research analysts. Particularly, M&A advisory comes under the domain of M&A specialists and fits into one of either two: seller representation or buyer representation (also called target representation and acquirer representation).

Representing the target	Representing the acquirer
<p>Sell-side representation is used when a company asks an investment bank to help it to sell a division, plant or subsidiary operation.</p> <p>In this respect, the first step is to write a selling memorandum and then contact the future buyers of the client.</p>	<p>Under this approach, the investment bank contacts the parties who wish to purchase. The investment banker also attempts to prepare an offer which can be feasible for all parties and helps to crack the deal.</p>

1.6 Private Placements: A private placement involves selling of debt or equity to few private parties. A private placement is different from a public offer because in case of a private placement, shares are offered to a few people instead of offering it to the public in general. Sometimes, the investment bankers advice their client to go for a private placement first and then apply for the initial public offer. The reason is that the bankers want to accumulate sufficient funds to justify the IPO.

The investment banker's work involved in a private placement is quite similar to sell-side M&A representation. The bankers attempt to find a buyer by writing the selling memorandum and then contacting potential strategic or financial buyers of the client.

8.8 Strategic Financial Management

Actually, the task of the investment banker is to convince the private investors to invest in the company and get the deal done. They charge fees for this service which is almost equal as is offered in the case of an IPO.

1.7 Financial Restructurings: When a company is not able to meet its obligations, the chances are that it may go bankrupt. In this situation, the company may either shut down its operations or it can restructure and remain in business.

Financial restructuring involves renegotiating payment terms on debt obligations. It also includes issuing new debt and restructuring payables to vendors. Investment bankers in this respect provide guidance to the companies by recommending sale of assets, issuing convertible stocks and bonds, or it even advices for the sale of the whole company.

The investment bankers who are in the restructuring business generally deal with distressed companies i.e. the companies who are either going for bankruptcy or in the middle of a bankruptcy process. In this regard, the investment bankers are hired to provide a best deal for the company in the form of forgiveness of a large part of the debt. The companies are also advised to restructure its debt in the most prudent manner possible and get out of the bankruptcy process. Moreover, the bankers in the restructuring arena are also legally adept. For example "*The Insolvency and Bankruptcy Code*" has a huge impact on the bankruptcy process.

As a company involved in a bankruptcy process faces enough cash problems, the investment banks often charge minimal monthly retainers. They hope that the company will revive and they then make a substantial profit. They also make good income in case new securities are issued to pay back the old debt.

Because a firm in bankruptcy already has substantial cash flow problems, investment banks often charge minimal monthly retainers, hoping to cash in on the spread from issuing new securities. Like other public offerings, this can be a highly lucrative and steady business.

2. Credit Rating

Credit Rating means an assessment made from credit-risk evaluation, translated into a current opinion as on a specific date on the quality of a specific debt security issued or on obligation undertaken by an enterprise in terms of the ability and willingness of the obligator to meet principal and interest payments on the rated debt instrument in a timely manner.

Thus Credit Rating is:

- (1) An expression of opinion of a rating agency.
- (2) The opinion is in regard to a debt instrument.
- (3) The opinion is as on a specific date.
- (4) The opinion is dependent on risk evaluation.
- (5) The opinion depends on the probability of interest and principal obligations being met timely.

Such opinions are relevant to investors due to the increase in the number of issues and in the presence of newer financial products viz. asset backed securities and credit derivatives.

Credit Rating does not in any way linked with:

- (1) Performance Evaluation of the rated entity unless called for.
- (2) Investment Recommendation by the rating agency to invest or not in the instrument to be rated.
- (3) Legal Compliance by the issuer-entity through audit.
- (4) Opinion on the holding company, subsidiaries or associates of the issuer entity.

It should be noted that rating is a continuous process and as new information come, an earlier rating can be revised.

While the rating is usually instrument specific, certain credit rating agencies like CARE, undertakes credit assessment of borrowers for use by banks and financial institutions.

2.1 Credit Rating Agencies in India: Around 1990, Credit Rating Agencies started to be set up in India,



Among them the most important ones are:

- 1) **Credit Rating Information Services of India Ltd. (CRISIL)** – Launched in the pre-reforms era, CRISIL has grown in size and strength over the years to become one of the top five globally rated agencies. It has a tie up with Standard and Poor's (S & P) of USA holding 10% stake in CRISIL. It has also set up CRIS – RISC a subsidiary for providing information and related services over the internet and runs an online news and information service.

8.10 Strategic Financial Management

- 2) **Investment Information and Credit Rating Agency (ICRA)** – It began its operations in 1991. Its major shareholders are leading financial institutions and banks. Moody's Investor Services through their Indian subsidiary, Moody's Investment Company India (P) Ltd. is the single largest shareholder.
- 3) **Credit Analysis and Research Ltd. (CARE)** – It was established in 1993. UTI, IDBI and Canara Bank are the major promoters. CARE occupies a pivotal position as a rating entity.
- 4) **Fitch Ratings India (P) Ltd.** – The Fitch Group, an internationally recognized statistical rating agency has established its base in India through Fitch Rating India (P) Ltd. as a 100% subsidiary of the parent organization. Its credit rating apply to a variety of corporates / issues and is not limited to governments, structured financial arrangements and debt instruments.
- 5) **SMERA** - SMERA is a division of Acuité Ratings & Research Limited dedicated to providing SME ratings & grading services to MSMEs. Acuité began its operations in year 2005 as SME Rating Agency of India Limited, a joint initiative of Small Industries Development Bank of India (SIDBI), Dun & Bradstreet Information Services India Private Limited (D&B) and leading public and private sector banks in India. Acuité is registered with the Securities and Exchange Board of India (SEBI) as a Credit Rating Agency and is accredited by Reserve Bank of India (RBI) as an External Credit Assessment Institution (ECAI), under BASEL-II norms for undertaking Bank Loan Ratings. [Source: www.smeraratings.in]
- 6) **Brickwork Ratings** – Brickwork Ratings (BWR), a SEBI registered Credit Rating Agency, has also been accredited by RBI and empanelled by NSIC, offers Bank Loan, NCD, Commercial Paper, MSME ratings and grading services, NABARD has empanelled Brickwork for MFI and NGO grading. BWR is accredited by IREDA and the Ministry of New and Renewable Energy (MNRE), Government of India, to grade companies seeking credit facilities from IREDA, Renewable Energy Service providing Companies (RESCO) and System Integrators (SIs). [www.brickworkratings.com]

All the six agencies are recognized by SEBI.

2.2 Credit Rating Process: The default-risk assessment and quality rating assigned to an issue are primarily determined by three factors:

- i) The issuer's ability to pay,
- ii) The strength of the security owner's claim on the issue, and
- iii) The economic significance of the industry and market place of the issuer.

The steps involved are:

- 1) **Request from issuer and analysis** – A company approaches a rating agency for rating a specific security. A team of analysts interact with the company's management and gathers necessary information. Areas covered are: historical performance, competitive position, business risk profile, business strategies, financial policies and short/long term

outlook of performance. Also, factors such as industry in which the issuer operates, its competitors and markets are taken into consideration.

- 2) **Rating Committee** – On the basis of information obtained and assessment made the team of analysts present a report to the Rating Committee. The issuer is not allowed to participate in this process as it is an internal evaluation of the rating agency. The nature of credit evaluation depends on the type of information provided by the issuer.
- 3) **Communication to management and appeal** – The Rating decision is communicated to the issuer and then supporting the rating is shared with the issuer. If the issuer disagrees, an opportunity of being heard is given to him. Issuers appealing against a rating decision are asked to submit relevant material information. The Rating Committee reviews the decision although such a review may not alter the rating. The issuer may reject a rating and the rating score need not be disclosed to the public.
- 4) **Pronouncement of the rating** – If the rating decision is accepted by the issuer, the rating agency makes a public announcement of it.
- 5) **Monitoring of the assigned rating** – The rating agencies monitor the on-going performance of the issuer and the economic environment in which it operates. All ratings are placed under constant watch. In cases where no change in rating is required, the rating agencies carry out an annual review with the issuer for updating of the information provided.
- 6) **Rating Watch** – Based on the constant scrutiny carried out by the agency it may place a rated instrument on Rating Watch. The rating may change for the better or for the worse. Rating Watch is followed by a full scale review for confirming or changing the original rating. If a corporate which has issued a 5 year 8% debenture merges with another corporate or acquires another corporate, it may lead to the listing of the specified.
- 7) **Rating Coverage** – Ratings are not limited to specific instruments. They also include public utilities; financial institutions; transport; infrastructure and energy projects; Special Purpose Vehicles; domestic subsidiaries of foreign entities. Structured ratings are given to MNCs based on guarantees or Letters of Comfort and Standby Letters of Credit issued by the banks. The rating agencies have also launched Corporate Governance Ratings with emphasis on quality of disclosure standards and the extent to which regulatory obligations have been complied with.
- 8) **Rating Scores** – A comparative summary of Rating Score used by four rating agencies in India is given below.

Sample of Rating Scores

Debentures	CRISIL	ICRA	CARE	Brickwork
Highest Safety	AAA*	AAA*	AAA*	BWR AAA
High Safety	AA*	AA*	AA*	BWR AA
Adequate Safety	A*	A*	A*	BWR A
Moderate Safety	BBB*	BBB*	BBB*	BWR BBB

8.12 Strategic Financial Management

Inadequate Safety	BB*	BB*	BB*	BWR BB
High Risk	B*	B*	B*	BWR B
Substantial Risk	C*	C*	C*	BWR C
Default	D*	D*	D*	BWR D
<u>Fixed Deposits</u>				
Highest Safety	FAAA	MAAA	A1	BWR FAAA
High Safety	FAA	MAA	A2	BWR FAA
Adequate Safety	FA	MA	A3	BWR FA

2.3 Uses of Credit Rating

For users –

- (i) Aids in investment decisions.
- (ii) Helps in fulfilling regulatory obligations.
- (iii) Provides analysts in Mutual Funds to use credit ratings as one of the valuable inputs to their independent evaluation system.

For issuers –

- (i) Requirement of meeting regulatory obligations as per SEBI guidelines.
- (ii) Recognition given by prospective investors of providing value to the ratings which helps them to raise debt / equity capital.

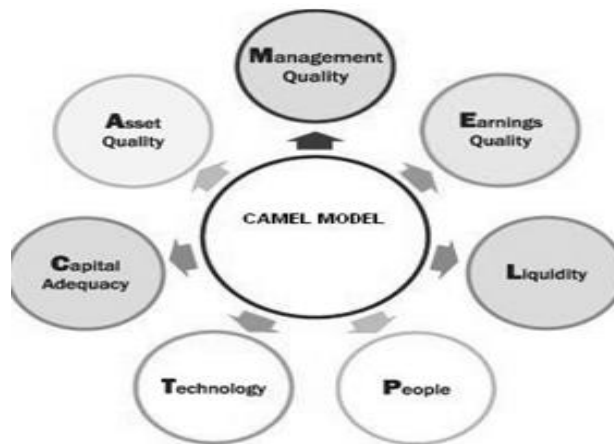
The rating process gives a viable market driven system which helps individuals to invest in financial instruments which are productive assets.

2.4 Limitations of Credit Rating

- 1) **Rating Changes** – Ratings given to instruments can change over a period of time. They have to be kept under rating watch. Downgrading of an instrument may not be timely enough to keep investors educated over such matters.
- 2) **Industry Specific rather than Company Specific** – Downgrades are linked to industry rather than company performance. Agencies give importance to macro aspects and not to micro ones; over-react to existing conditions which come from optimistic / pessimistic views arising out of up / down turns.
- 3) **Cost Benefit Analysis** – Rating being mandatory, it becomes a must for entities rather than carrying out Cost Benefit Analysis. Rating should be left optional and the corporate should be free to decide that in the event of self rating, nothing has been left out.
- 4) **Conflict of Interest** – The rating agency collects fees from the entity it rates leading to a conflict of interest. Rating market being competitive there is a distant possibility of such conflict entering into the rating system.
- 5) **Corporate Governance Issues** – Special attention is paid to

- (a) Rating agencies getting more of its revenues from a single service or group.
- (b) Rating agencies enjoying a dominant market position engaging in aggressive competitive practices by refusing to rate a collateralized / securitized instrument or compelling an issuer to pay for services rendered.
- (c) Greater transparency in the rating process viz. in the disclosure of assumptions leading to a specific public rating.

2.5 Camel Model in Credit Rating: CAMEL Stands for Capital, Assets, Management, Earnings and Liquidity. The CAMEL model adopted by the Rating Agencies deserves special attention; it focuses on the following aspects:



- (a) **Capital** – Composition of Retained Earnings and External Funds raised; Fixed dividend component for preference shares and fluctuating dividend component for equity shares and adequacy of long term funds adjusted to gearing levels; ability of issuer to raise further borrowings.
- (b) **Assets** – Revenue generating capacity of existing / proposed assets, fair values, technological / physical obsolescence, linkage of asset values to turnover, consistency, appropriation of methods of depreciation and adequacy of charge to revenues. Size, ageing and recoverability of monetary assets viz receivables and its linkage with turnover.
- (c) **Management** – Extent of involvement of management personnel, team-work, authority, timeliness, effectiveness and appropriateness of decision making along with directing management to achieve corporate goals.
- (d) **Earnings** – Absolute levels, trends, stability, adaptability to cyclical fluctuations ability of the entity to service existing and additional debts proposed.
- (e) **Liquidity** – Effectiveness of working capital management, corporate policies for stock and creditors, management and the ability of the corporate to meet their commitment in the short run.

8.14 Strategic Financial Management

These five aspects form the five core bases for estimating credit worthiness of an issuer which leads to the rating of an instrument. Rating agencies determine the pre-dominance of positive / negative aspects under each of these five categories and these are factored in for making the overall rating decision

2.6 Credit Rating Agencies and the US sub-prime crisis: Credit rating agencies played a very important role at various stages in the subprime crisis. They have been highly criticized for understating the risk involved with new, complex securities that fueled the United States housing bubble, such as mortgage-backed securities (MBS) and collateralized debt obligations (CDO).

An estimated \$3.2 trillion in loans were made to homeowners with bad credit and undocumented incomes (e.g., subprime or Alt-A mortgages) between 2002 and 2007. These mortgages could be bundled into MBS and CDO securities that received high ratings and therefore could be sold to global investors. Higher ratings were believed justified by various credit enhancements including over-collateralization (i.e., pledging collateral in excess of debt issued), credit default insurance, and equity investors willing to bear the first losses. The critics acclaim that the rating agencies were the party that performed the alchemy that converted the securities from F-rated to A-rated. The banks could not have done what they did without the complicity of the rating agencies." Without the AAA ratings, demand for these securities would have been considerably less. Bank write downs and losses on these investments totalled \$523 billion as of September 2008.

The ratings of these securities were a lucrative business for the rating agencies, accounting for just under half of Moody's total ratings revenue in 2007. Through 2007, ratings companies enjoyed record revenue, profits and share prices. The rating companies earned as much as three times more for grading these complex products than corporate bonds, their traditional business. Rating agencies also competed with each other to rate particular MBS and CDO securities issued by investment banks, which critics argued contributed to lower rating standards.

3. Consumer finance

With globalization of the economy, there was a spurt of employment opportunities resulting in the increase of salaried persons. There was a cascading effect of a steady increase in demand and supply of durable consumer valuables thereby paving the way for consumer credit.

Consumer credit provides short term/medium term loans to finance purchase of goods or services for personal use. There are four important sources of consumer finance viz manufacturers / sellers/dealers, finance companies, banks, credit card companies. In the past, banks provided finance to manufacturing organizations. The consumers borrowed money from the sellers/dealers directly. Finance companies too entered this arena while credit card entitles with the support from banks started operating with substantial success. Both nationalized and private sector banks have started marketing aggressively for a large slice of the market share in this consumer finance segment. Employers also provide loan facilities to salary earners as a part of welfare scheme for their employees. In big concerns, employees organise themselves

into co-operative credit societies and funds raised by its members through periodical contributions are used as loan assistance at low rate of interest.

3.1 Purpose behind Consumer Finance: Banks provide consumer finance in the form of personal loans for expenditure on education or to meet shortfalls in family budgets aimed at providing liquidity and cash support. This also applies to cash drawl facility extended by credit card companies. Manufacturers/dealers in consumer durables, finance companies along with credit card companies also provide consumer assistance towards the purchase of goods and services.

3.2 Structure of Loans: In order to attract consumers, lenders provide various loan products containing different features. However, there are three important aspects which are common to all consumer loans.

(1) Loan Amount (2) Interest Charges for the borrowed period (3) Loan Amount together with interest to be repaid by the borrower in a given period by installments.

In a hire purchase transaction e.g. car loans the legal ownership is retained with the financier whereas in an installment credit e.g. Refrigerators, TVs, the ownership vests with the buyer subject to unpaid vendor's lien on such goods. The repayment period varies between 36 and 60 months. The motto followed by the finance companies is to entice the consumer with "Buy now and Pay later" instead of "Save now and Buy later".

3.3 Basis of Credit Evaluation: While carrying out credit evaluation of a consumer, the finance company gives emphasis on the three C's of lending viz Capacity, Capital and Character. Capacity and Capital focuses on the ability of the borrower to repay. Character, on the other hand, stresses on the willingness of the borrower to repay by following a prescribed schedule. The finance companies have to look into the underlying factors such as:

- (a) Present/Future earnings potential of the individual and the amount of surplus available for repayment
- (b) Past track record, social status and reputation of the individual
- (c) Existing level of debts, initial contribution/safety margins a credit seeker can provide by means of tangible security so as to protect the interest of the lenders in the form of third party guarantees.

It is to be noted that consumer loans are costlier than business loans.

3.4 Some Concepts

Flat Rate

Under such a scheme finance companies structure their hire purchase loans on a flat rate whereby a quoted flat interest rate is applied to the principal amount for the entire period of the contract and the aggregate of principal and interest thus computed has to be repaid in equated installments in that period. The effective rate IRR computed on the basis of flat rate will be higher than the reducing balance method. Repayments are structured either as payments in advance or payments in arrears.

8.16 Strategic Financial Management

Payment in Arrears

Effective Interest Rate differs depending on the timing of cash payments. Effective Rate under a loan system where installments are payable at the end of each month would be lower than what it would be if the installments are payable at the beginning of each month.

3.5 Regulation of Consumer Finance: Consumer Finance provided to the automobile sector by Non Bank Finance Companies (NBFCs) are governed by RBI's regulations where registration and maintenance of minimum Net Operating Funds and Capital Adequacy on an ongoing basis are mandatory. For banks engaged in consumer finance, the Banking Regulation Act and RBI Act are required to be adhered to.

Illustration 1

Mr Alok wants to buy a car. The invoice price is ₹ 240,000/-. Mr Alok can pay ₹ 28,375 as down payment. A finance company offers him a hire-purchase deal of repayment in 30 months, the flat rate being 6.497%.

Solution

Computation of Monthly Installments

Cash Cost	₹ 2,40,000
Down payment	₹ 28,375
Finance amount (Cash cost – down payment)	₹ 2,11,625
Flat rate	6.497%
Amount of finance charges (6.497% p.a. x 2.5 years = 16.243%, applied on finance amount)	₹ 34,375
Total amount repayable	₹ 2,46,000
Duration	30 months
EMI	₹ 8,200

Computation of Effective Rate

Effective rate is the IRR of cash flows

Initial outlay	₹ 2,11,625
Amount of annuity	₹ 8,200
Annuity factor for 30 months	25.808

By a reference to annuity tables, we can find that this is 1% per month or closely approximates to 1% for a 30 months period 12% per annum

Effective rate being charged by finance company is therefore 12% p.a., although the apparent rate is only 6.497%

Illustration 2

Lenders and Company has come up with a special offer for its customers, for purchase of TVs, Refrigerators, Electronic Equipment and other home appliances. A visit to their show room and discussions with sales persons reveal the following:

- *The offer is available for a minimum purchase of items for list price of ₹ 18,000*

- The purchase price can be paid in 12 equal monthly installments. The first payment is to be made on the date of purchase and the remaining 11 installments are payable each of the following months, on the same calendar date of purchase
- If the buyers opt to pay in cash, they can get a steep discount of ₹ 1173 for each lot of purchases worth ₹ 18,000/-
 - a. Is there an interest element involved in Zero interest offer?
 - b. If yes, what is the rate?
 - c. Which offer would you prefer?

Solution

Since Lenders and Co are ready to sell the item, with a discount of ₹ 1,173 for each lot of ₹ 18,000, the cash price for the goods is equal to ₹ 16, 827. The implicit rate in the offer is the rate at which present value of all the installments equals the cash price of ₹ 16,827

Cash price	₹ 16,827
Outflow if installment payments are accepted	₹ 18,000
First installment being paid on day Zero	₹ 1,500
Balance in 11 installments	<u>₹ 16,500</u>

IRR at which present value of 12 installments equals ₹ 16827 is 1.25%

0	1,500	1.000	1,500
1-11	1,500	10.218	<u>15,327</u>
			<u>16,827</u>

IRR = 1.25 p.m x 12 = 15 % p.a

- a. Yes, there is an interest element involved.
- b. Interest element involved in the offer is 15% p.a.
- c. If the customer can borrow from an alternative source at 15%, he should borrow and buy. Otherwise, he should accept the installment credit

4. Factoring

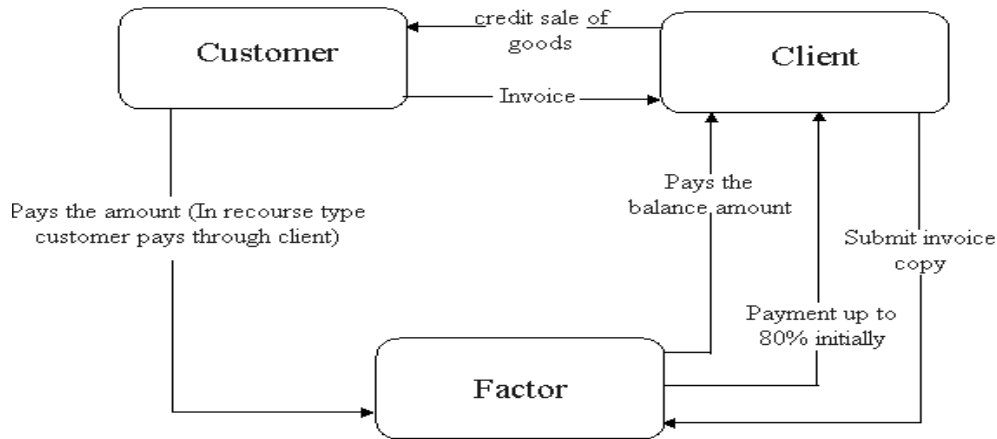
This concept has not been fully developed in our country and most of their work is done by companies themselves. All units particularly small or medium size units have to make considerable efforts to realize the sale proceeds without much success creating functional difficulties for such units.

Many a units under small-scale sector have become sick only because of delay/non-realisation of their dues from large units. Introduction of factoring services will, therefore, prove very beneficial for such units as it will free the units from hassles of collecting receivables to enable them to concentrate on product development and marketing.

4.1 Definition and Mechanism:

Factoring process has been succinctly explained in the following diagram:

8.18 Strategic Financial Management



The study group appointed by the International Institute for the Unification of Private Law (UNIDROIT), Rome, during 1988, recommended, in general terms, the definition of factoring as under:

“Factoring means an arrangement between a factor and his client which includes at least two of the following services to be provided by the factor:

- Finance
- Maintenance of debt
- Collection of debts
- Protection against credit risk”.

However, the above definition applies only to factoring in relation to supply of goods and services: (i) across national boundaries; (ii) to trade or professional debtors; (iii) when notice of assignment has been given to the debtors. Domestic factoring is not yet a well defined concept and it has been left to the discretion of legal framework as well as trade usage and convention of the individual country.

In India factoring is undertaken by different bank subsidiaries like SBI Factors and Commercial Services Ltd. Promoted by SBI and Canara Bank Factors Ltd. promoted jointly by Canara Bank, Andhra Bank and SIDBI.

4.2 Types/forms of Factoring: Depending upon the features built into the factoring arrangement to cater to the varying needs of trade/citizens, there can be different kinds of factoring:

Recourse and Non-recourse Factoring

Under a recourse factoring arrangement, the factor has recourse to the client (firm) if the debt purchased/receivable factored turns out to be irrecoverable. In other words, the factor does not assume credit risks associated with the receivables. The factor does not have the right to recourse in the case of non-recourse factoring. The loss arising out of irrecoverable receivables is borne by him, as a compensation for which he charges a higher commission.

Advance and Maturity factoring

The factor pays a pre specified portion, ranging between three-fourths to nine tenths, of the factored receivables in advance, the balance being paid upon collection/on the guaranteed payment date. A drawing limit, as a pre-payment, is made available by the factor to the client as soon as the factored debts are approved/the invoices are accounted for. The client has to pay interest (discount) on the advance/repayment between the date of such payment and the date of actual collection from the customers/or the guaranteed payment date, determined on the basis of the prevailing short-term rate, the financial standing of the client and the volume of the turnover.

In Maturity factoring, the client sells his invoice to the factor and the factor pays the client for such invoices either on the date of maturity or any date after the date of maturity. In this type of factoring, the factor does not pay the client any advance money. For instance, the money payable on an invoice on 31st October, 2018 shall be paid either on 31st October, 2018 or any other date after maturity decided between the client and the factor.

Full factoring

This is the most comprehensive form of factoring combining the features of all the factoring services specially those of non-recourse and advance factoring. It is also known as old line factoring.

Disclosed and undisclosed Factoring

In disclosed factoring, the name of the factor is disclosed in the invoice by the supplier-manufacturer of the goods asking the buyer to make payment to the factor; the name of the factor is not disclosed in the invoice in undisclosed factoring although the factor maintains the sales ledger of the supplier-manufacturer. The entire realization of the business transaction is done in the name of the supplier company but all control remains with the factor.

Domestic and export/Cross Border Factoring

If the three parties involved, namely, customer (buyer), client,(seller-supplier) and factor (financial intermediary) are domiciled in the same country then it is known as domestic factoring. There are usually four parties involved to a cross border factoring transaction. They are:

1. Exporter (client)
2. Importer (customer)
3. Export factor
4. Import Factor

It is also known as two-factor system.

4.3 Functions of a factor: The main functions of a factor could be classified into five categories:

- **Maintenance/administration of sales ledger:** The factor maintains the clients' sales

8.20 Strategic Financial Management

ledgers. On transacting a sales deal, an invoice is sent to the customer and a copy of the same is sent to the factor. The factor also gives periodic reports to the client.

- **Collection facility:** The factor undertakes to collect the receivables on behalf of the client relieving him of the problems involved in collection, and enables him to concentrate on other important functional areas of the business. It also enables the client to reduce the cost of collection by way of savings in manpower, time and efforts.
- **Financing Trade Debts :** The unique feature of factoring is that a factor purchases the book debts of its clients at a price and the debts are assigned in favour of factor who is usually willing to grant advances to the extent of 80% of the assigned debts.
- **Credit Control and Credit Protection :** Assumptions of credit risk is one of the most important functions of the factor. This service is provided where debts are factored without recourse. The factor in consultation with the client fixes credit limits for approved customers.
- **Advisory Services :** By virtue of their specialized knowledge and experience in finance and credit dealings and access to extensive credit information; factors can provide the following information services to the clients:
 1. Customer's perception of the clients products, changing in marketing strategies, emerging trends etc.
 2. Audit of the procedures followed for invoicing, delivery and dealing with sales returns.
 3. Introduction to the credit department of a bank/subsidiaries of banks engaged in leasing, hire-purchase, merchant banking.

Illustration 3

A Ltd. Has annual credit sales of ₹ 219 lakh and its average collection period is 50 days. The past experience indicates that bad debt losses are around 2% of credit sales. The factoring is expected to save ₹ 2 lakh in administration costs and also to eliminate all bad debt losses. The factor has agreed to advance 80% of the receivables at 15% p.a. Compute the net factoring cost if factoring commission is 2%.

Solution

Average receivable = (₹ 219lakh/365) X 50 = ₹ 30 lakh

Factoring Commission = 2% on ₹ 30 lakh = ₹ 0.6 lakh

Amount available for advance = 80% of ₹ 30 lakh – Factoring commission (₹ 0.6 lakh) = ₹ 23.4 lakh.

The factor will actually remit the advance net of interest for 50 days.

The annual rate of interest is 15% and so rate of interest for 50 days = $(15/365) \times 50 = 2.05\%$

Interest for 50 days on ₹ 23.4 lakh = 2.05% on ₹ 23.4 lakh = ₹ 0.48 lakh

The advance remitted to client = ₹ 23.4 lakh – ₹ 0.48 lakh = ₹ 22.92 lakh

Factoring cost for 50 days = Factoring commission + Interest

= ₹ 0.6 lakh + ₹ 0.48 lakh = ₹ 1.08 lakh

Factoring cost for year = (₹ 1.08 lakh) x (365/50) = ₹ 7.884 lakh

Net Factoring Cost

Particulars		₹ lakh
Factoring cost per year		7.884
Less: Costs saved per year		
Bad Debt = 2% on ₹ 219 lakh	4.38	
Administration cost saved	2.00	6.380
Net Factoring cost per year		1.504
Advance		22.920
Net Factoring cost per year (%) = (1.504/22.92) X 100		6.56%

4.4 Forfaiting: Forfaiting is a form of financing of receivables pertaining to international trade. It denotes the purchase of trade bills/promissory notes by a bank/financial institution without recourse to the seller. The purchase is in the form of discounting the documents covering the entire risk of nonpayment in collection. All risk and collection problems are fully the responsibility of the purchaser (forfeiter) who pays cash to the seller after discounting the bills/notes.

4.5 Difference between Forfaiting vs Export Factoring

- (a) A forfaiter discounts the entire value of the note/bill. In a factoring arrangement the extent of financing available is 75-80%.
- (b) The forfaiter's decision to provide financing depends upon the financing standing of the availing bank. On the other hand in a factoring deal the export factor bases his credit decision on the credit standards of the exporter.
- (c) Forfaiting is a pure financial agreement while factoring includes ledger administration as well as collection.
- (d) Factoring is a short-term financial deal. Forfaiting spreads over 3-5 years.

Illustration 4

A Ltd. has a total sales of ₹ 3.2 crores and its average collection period is 90 days. The past experience indicates that bad-debt losses are 1.5% on Sales. The expenditure incurred by the firm in administering its receivable collection efforts are ₹ 5,00,000. A factor is prepared to buy the firm's receivables by charging 2% Commission. The factor will pay advance on receivables to the firm at an interest rate of 18% p.a. after withholding 10% as reserve.

Calculate the effective cost of factoring to the Firm.

8.22 Strategic Financial Management

Solution

	₹
Average level of Receivables = $3,20,00,000 \times 90/360$	80,00,000
Factoring commission = $80,00,000 \times 2/100$	1,60,000
Factoring reserve = $80,00,000 \times 10/100$	8,00,000
Amount available for advance = ₹ $80,00,000 - (1,60,000 + 8,00,000)$	70,40,000
Factor will deduct his interest @ 18%:-	
Interest = $\frac{₹ 70,40,000 \times 18 \times 90}{100 \times 360}$	= ₹ 3,16,800

∴ Advance to be paid = ₹ 70,40,000 – ₹ 3,16,800 = ₹ 67,23,200

Annual Cost of Factoring to the Firm:	₹
Factoring commission (₹ $1,60,000 \times 360/90$)	6,40,000
Interest charges (₹ $3,16,800 \times 360/90$)	<u>12,67,200</u>
Total	<u>19,07,200</u>
Firm's Savings on taking Factoring Service:	₹
Cost of credit administration saved	5,00,000
Cost of Bad Debts (₹ $3,20,00,000 \times 1.5/100$) avoided	<u>4,80,000</u>
Total	<u>9,80,000</u>
Net cost to the Firm (₹ $19,07,200 - ₹ 9,80,000$)	<u>9,27,200</u>
Effective rate of interest to the firm = $\frac{₹ 9,27,200 \times 100}{67,23,200}$	13.79%

Note: The number of days in a year has been assumed to be 360 days.

5. Housing Finance

The volume and growth rate across time periods in housing loans are viewed as one of the important barometers of measuring growth in an economy. Increased activity in housing sector viz. renovation, modernization leads to demand for iron and steel, cement which have a positive effect on various sectors as well.

The demand for Housing Finance comes from:

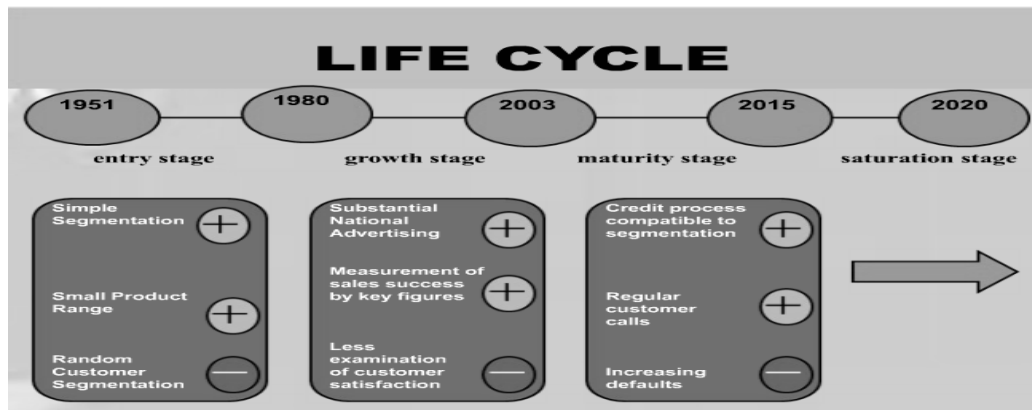
- 1) Salary earners and self employed professionals with their basic need of a roof over their head.
- 2) Non residents having an eye on capital appreciation of the asset or with an eye to their possible resettlement in India for NRIs.

The supply of loans comes from:

- (a) LIC, National Housing Bank in the government sector.

- (b) Private Sector housing companies viz. HDFC, Commercial Banks etc.
- (c) Non Banking Finance Companies, Nidhis and Chit funds, Co-operative and Credit Societies, employers extending staff loans for housing, beside private money lenders.

The following diagram illustrates the growth trajectory for the housing finance industry in India



5.1 Regulatory Framework: Commercial Banks fund their loans from public deposits. In a falling interest rate regime, investors lock their funds for short duration in the hope of a hike in rates in future. In contrast, housing loans are for longer periods resulting in maturity mismatch which in turn leads to interest rate risks. Commercial banks have to monitor both these areas regularly to make sure that risks associated with floating rate deposits (shorter maturities) and fixed rate housing loans are minimized.

The RBI has laid down guidelines for commercial banks undertaking gap analysis both for interest rate and maturity mismatches.

5.2 Loan Structure and Interest Rates

- 1) Tenor – Loan structure is 8 years on an average. A longer repayment period of 10, 15 or 20 years is also available to deserving cases.
- 2) EMI – Considering convenience of recovery, equated monthly repayment is stipulated by lenders.
- 3) Interest Rate – Interest rate applicable for the loan varies with the tenor. The longer the period, the higher is the interest rate.
- 4) Fixed vs. Floating – Under fixed interest rates, the rates remain the same for the entire tenor of the loan. Under floating interest rates, interest rates are periodically revised in line with a reference rate.
- 5) Security – The tangible asset that emerges by use of finance or an alternative asset of adequate value is taken as security. Besides borrower’s direct liability supporting guarantees from individuals or entities with net worth compatible with loan amount are also stipulated.

8.24 Strategic Financial Management

- 6) Low Rates – Interest rates are relatively low because lenders believe that given borrower's affinity and sentimental value attachment to houses, the risk of default is not high.

Illustration 5

Fixed Interest rates quoted on housing loans by a nationalized bank for three different maturity periods are as follows.

Interest Rate	Tenure of Loan
10%	3 years
11%	5 years
12%	10 years

Compute EMI for a loan of ₹ 72,500 for each of the maturities.

Solution

Interest rate	10% (3 years) Option I	11% (5 years) Option II	12% (10 years) Option III
Annual Interest (I)	10%	11%	12%
Loan Period	3 years	5 years	10 years
Interest Rate adjusted on one month basis (I/12)	0.833	0.916	1.000
Loan Amount	₹ 72,500	₹ 72,500	₹ 72,500
Monthly payments	Annuities	Annuities	Annuities
PVAF for 36/60/120 months	30.99	45.99	69.70
Annuity = Loan Amount / PVAF	₹ 2339.46	₹ 1576.43	₹ 1040.17

Illustration 6

Mr. Stanley Joseph has secured from a housing bank, a six year housing loan of ₹ 12,00,000. The loan was structured as follows:

Loan Amount	---	₹ 12,00,000
Repayment	---	Six equated annual installments, payable in arrears.
Reference Base	---	Prime Lending Rate
Reference Rate	---	9% on the date of loan
Interest on Loan	---	1 percentage point over reference rate of 9%
Annual Installment	---	₹ 2,75,530

Two years after the loan was granted, the prime rate moves down to 8% and the effective rate on the loan automatically stood revised to 9%. What action can the bank take?

Solution

Revision in equated Instalments

- 1) Determination of Unpaid principal
- 2) Re-Computation of EMI for revised period at revised rate

Determination of Remaining Principal

Year	Opg. Bal (₹)	Interest @10% (₹)	Total (₹)	Repaid (₹)	Clg. Bal (₹)
1	12,00,000	1,20,000	13,20,000,	2,75,530	10,44,470
2	10,44,470	1,04,447	11,48,917	2,75,530	8,73,387

Determination of Revised Equated Monthly Installments

New Amount	₹ 8,73,387	
New Period	4 years	
New Rate (8% + 1%)	9%	
PVAF	3.240	
Installment	₹ 8,73,387 / 3.240	= ₹ 2,69,564

Bank shall revise installment from ₹ 2,75,530 to ₹ 2,69,564.

Illustration 7

You have a housing loan with one of India's top housing finance companies. The amount outstanding is ₹ 1,89,540. You have now paid an installment. Your next installment falls due a year later. There are five more installments to go, each being ₹ 50,000. Another housing finance company has offered to take over this loan on a seven year repayment basis. You will be required to pay ₹ 36,408 p.a. with the first installment falling a year later. The processing fee is 3% of amount taken over. For swapping you will have to pay ₹ 12,000 to the first company. Should you swap the loan?

Solution

Present Interest Rate

For a loan of ₹ 1,89,540 annuity being ₹ 50,000 , PVAF = 3.791 (₹ 1,89,540 / ₹ 50,000). From PVAF table for 5 years, this corresponds to 10%.

New Interest Rate

For a similar loan, annuity being ₹ 36,408, PVAF = 5.206 (₹ 1,89,540 / ₹ 36,408). From PVAF table for 7 years, this corresponds to 8%.

Interest Rate is prima facie beneficial.

Additional Charges

- | | |
|--|----------|
| (i) Swap Charges | ₹ 12,000 |
| (ii) Processing fee 3% on loan amount (3/100 × ₹ 1,89,540) | ₹ 5,686 |

8.26 Strategic Financial Management

Considering these two factors, IRR = 10.947%

Interest rate on existing loan is 10% while proposed loan is 10.947%. Proposed loan is more expensive. Do not swap.

6. Asset Restructuring/Management Company

Asset Management Companies are those companies which manage the Mutual Funds in accordance with an approved mutual fund scheme. Mutual funds raise money by selling investment units of the fund to the public; money received from the sale of investment units is invested in securities or other assets or used to seek a return by any other means. A mutual fund is an investment vehicle suitable for retail investors who have a limited amount of money, lack of experience, knowledge, skill, or time.

Mutual funds are trusts which pool resources from large number of investors through issue of units for investments in the capital market instruments like shares, debentures and bonds and money market instruments like commercial papers, certificate of deposits and treasury bonds. The income earned through these investments and the capital appreciation realized are shared by the unit holders in proportion to the number of units owned by them.

The management company shall manage the fund strictly in accordance with the policy and objectives of the fund as specified in the mutual fund proposal and prospectus. The fund shall invest in types of securities or assets, having diversification and investment limits as specified by law.

Any person authorized by the management company can make investment decisions according to the investment policy indicated in the mutual fund scheme. A person assigned by the management company can sell investment units of the mutual fund to the public. The person must be approved and meet the qualifications as specified by the authorities, and shall perform his or her duties as prescribed in sales practices, such as recommending a fund that is suitable for the customer's investment objectives.

Asset Reconstruction means to manage and recover Non Performing Assets (NPA's) purchased from the banks. The job is to bail out banks from the pile of bad loans in which it is sitting. So, here comes the Asset Reconstruction Companies (ARC's). Their job is to clear the bad assets (NPA's) from the books of companies. For example, it can handle some of the cases of home loan defaults and pursue the defaulters to pay the sum due. If they do not respond then ARC's may start foreclosing and selling the properties to extract cash from the defaulted loan amount. They specialize in such activity and can handle them more efficiently because they have the required manpower, experience and support network to do so. Now, whether ARC's always make profits. Not always. They purchase bad loans from the banks and then they take steps to recover that money. If they are able to recover the money, they make a profit, otherwise they lose money.

How ARC's purchase assets?

The Asset Reconstruction Companies purchase assets in the following manner and the whole process is closely monitored by the banking regulator:

(i) **Raising Funds** - Asset Reconstruction Companies are allowed to raise funds from Qualified Institutional Buyers only in order to make payment to buy discounted debts from banks. They raise fund through the issue of security receipts to QIB's. The security receipt gives the QIB a right, title or interest in the financial asset that is brought by the ARC. ARC's also issues debt instruments or even sells equity to raise funds. Further, they have to take a special precaution that retail investors are excluded from it. The reason is that ARC's are highly risky and only QIB's are able to withstand such risk in case of a loss.

(ii) **Partnership Method** – Many times, ARC's do not directly buy debts from the banks. They remain on the banks books. And, the bank hires the ARC to do the debt recovery process. Whatever revenue generated is divided between banks and ARC in a predetermined manner.

7. Depository Services

The term 'Depository' means a place where something is deposited for safe keeping; a bank in which funds or securities are deposited by others under the terms of specific depository agreement. Depository means one who receives a deposit of money, securities, instruments or other property, a person to whom something is entrusted, a trustee, a person or group entrusted with the preservation or safe keeping of something.

The depository is an organization where the securities of a shareholder are held in the form of electronic accounts, in the same way as a bank holds money. The depository holds electronic custody of securities and also arranges for transfer of ownership of securities on the settlement dates. This system is known as 'scripless trading system'. Any body eligible to provide depository services must register with SEBI.

A depository is an organization which holds the securities of the investors in the form of electronic book entries in the same way a bank holds money. A depository transfers securities without physically handling securities, the way a bank transfers funds without actually handling money.

7.1 Depository System: Depository system is concerned with conversion of securities from physical to electronic form, settlement of trades in electronic segment, electronic transfer of ownership of shares and electronic custody of securities. All securities in the depositories are identical in all respects and are thus fungible. The ownership and transfer of securities take place by means of book entries, avoiding the risks associated with paper.

Services provided by a Depository are as follows:

- Dematerialisation (usually known as demat) is converting physical certificates to electronic form
- Rematerialisation, known as remat, is reverse of demat, i.e. getting physical certificates from the electronic securities
- Transfer of securities, change of beneficial ownership
- Settlement of trades done on exchange connected to the Depository

7.2 Physical vis-à-vis Dematerialised Share Trading

Physical	Dematerialised
(1) Actual Delivery of Share is to be exchanged	(1) No Actual Delivery of shares is needed
(2) Open Delivery can be kept	(2) Not possible to keep delivery open
(3) Processing time is long	(3) Processing time is less
(4) Stamp Charges @ 0.5% are levied for transfer	(4) No Stamp Charges are required for transfer
(5) For sales transaction, no charges other than brokerage are levied	(5) Sales transactions are also charged
(6) For buy transaction, delivery is to be sent to company for Registration.	(6) No need to send the document to the company for Registration.

7.3 Depositories in India

1. *National Securities Depository Limited (NSDL)* – NSDL was registered by the SEBI on June 7, 1996 as India's first depository to facilitate trading and settlement of securities in the dematerialized form. The NSDL is promoted by IDBI, UTI and NSE to provide electronic depository facilities for securities traded in the equity and debt markets in the country. NSDL has been setup to cater to the demanding needs of the Indian capital markets. In the first phase of operations NSDL will dematerialize scrips and replace them with electronic entries

2. *Central Depository Service (India) limited (CDSL)* – CDSL commenced its operations during February 1999. CDSL was promoted by Stock Exchange, Mumbai in association with Bank of Baroda, Bank of India, State Bank of India and HDFC Bank.

7.4 Pros and Cons of Depository Services-The major benefits accruing to investors and other market players are as follows:

1. Securities are held in a safe and convenient manner
2. Transfer of securities is effected immediately
3. Stamp duty for transfer is eliminated and transaction costs are reduced
4. Paper work is minimized
5. Bad deliveries, fake securities and delays in transfers are eliminated.
6. Routine changes viz. change in address of one person owning securities issued by different companies can be taken care of simultaneously for all securities with little delay.
7. Benefit accruing from issue of bonus shares, consolidation, split or merger is credited without much difficulty.
8. Payment of dividends and interest is expedited by the use of electronic clearing system.
9. Securities held in electronic form can be locked in and frozen from either a sale or purchase for any definite period.

10. Securities held in electronic form can also be pledged for any credit facility. Both the lender (pledge) and the investor- borrower (pledgor) are required to have a depository account. Once the pledgee confirms the request of the investor the depository takes action and the pledge is in place. By a reverse process, the pledge can be released once the pledge confirms receipt of funds.

There is however risks as well which are briefly discussed as below:

(i) System failure – Input control, process control and output control being parts of computerized environment apply equally to the dematerialization process. Unforeseen failures, intentional or otherwise, on the part of the individuals entrusted with protecting data integrity, could lead to chaos.

(ii) Additional record keeping – In built provisions for rematerialization exist to take care of the needs of individuals who wish to hold securities in physical form. Companies will invariably need to maintain records on a continuous basis for securities held in physical form. Periodical reconciliation between demat segment and physical segment is very much necessary.

(iii) Cost of Depository Participant (DP) – For transacting business, investors have to deal not only with brokers but also with depository participant which acts as an additional tier in the series of intermediaries. A one time fee is levied by the depository participant which small investors consider to be an avoidable cost.

(iv) Human Fraud – Dematerialization is not a remedy for all ills. Unlawful transfers by individuals against whom insolvency proceedings are pending or transfers by attorney holders with specific or limited powers are possible.

7.5 Functioning of Depository Services: To speed up the transfer mechanism of securities from sale, purchase, transmission, SEBI introduced Depository Services also known as Dematerialization of listed securities. It is the process by which certificates held by investors in physical form are converted to an equivalent number of securities in electronic form. The securities are credited to the investor's account maintained through an intermediary called Depository Participant (DP). Shares/Securities once dematerialized lose their independent identities. Separate numbers are allotted for such dematerialized securities. Once a security has been dematerialized it can be at the option of the investor converted back to physical form. This is known as Rematerialization. Organization holding securities of investors in electronic form and which renders services related to transactions in securities is called a Depository. A depository holds securities in an account, transfers securities from one account holder to another without the investors having to handle these in their physical form. The depository is a safe keeper of securities for and on behalf of the investors.

8. Debit Cards

Debit cards are also known as cheque cards. A debit card is a plastic card that provides the cardholder electronic access to his or her bank account(s) at a financial institution. Debit cards look like credit cards or ATM (automated teller machine) cards, but operate like cash or a personal cheque. Debit cards are different from credit cards. While a credit card is to “pay

8.30 Strategic Financial Management

later,” a debit card is to “pay now.” When one uses a debit card his money is quickly deducted from his cheque or savings account.

Debit cards are accepted at many locations, including grocery stores, retail stores, gasoline stations, and restaurants. One can use his card anywhere; merchants display his card’s brand name or logo. They offer an alternative to carrying a cheque book or cash.

8.1 Difference between A Debit Card and A Credit Card: It’s the difference between “debit” and “credit.” Debit means “subtract.” When one uses a debit card, one is subtracting his money from his own bank account. Debit cards allow him spend only what is in his bank account. It is a quick transaction between the merchant and his personal bank account.

Credit is money made available by a bank or other financial institution, like a loan. The amount the issuer allows one to use is determined by his credit history, income, debts, and ability to pay. One may use the credit with the understanding that he will repay the amount, plus interest if he does not pay in full each month. He will receive a monthly statement detailing his charges and payment requirements.

The basic difference between the two is the fact that a credit card takes the form of a personal loan from the issuing bank to the consumer, while a debit card is more like a cheque, money is directly deducted from a person’s bank account to pay for transaction.

8.2 Benefits of Debit Cards

- (1) Obtaining a debit card is often easier than obtaining a credit card.
- (2) Using a debit card instead of writing cheques saves one from showing identification or giving his/ her personal information at the time of the transaction.
- (3) Using a debit card frees him/ her from carrying cash or a cheque book.
- (4) Using a debit card means he/ she no longer has to stock up on traveller’s cheques or cash when he travels
- (5) Debit cards may be more readily accepted by merchants than cheques, in other states or countries wherever the card brand is accepted.
- (6) The debit card is a quick, “pay now” product, giving one no grace period.
- (7) Using a debit card may mean one has less protection than with a credit card purchase for items which are never delivered, are defective, or misrepresented. But, as with credit cards, one may dispute unauthorized charges or other mistakes within 60 days. One should contact the card issuer if a problem cannot be resolved with the merchant.
- (8) Returning goods or canceling services purchased with a debit card is treated as if the purchase were made with cash or a cheque.

Benefits of credit cards over debit cards

- (1) With a flexible spending limit, a cardholder can take advantage of the easy loan facility of a credit card, and can use it to purchase items or spend money that he expects in the near future, not just money that he presently has in his account.

- (2) Most of the major features of a debit card such as withdrawal of cash from ATMs are available on credit cards as well.
- (3) A credit card has a wider acceptance and recognition, especially in online transactions.
- (4) A credit card has greater security measures and checks than a debit card.
- (5) Credit cards allow for cash back and bonus points schemes that a debit card is not eligible for.
- (6) A credit card can be used as a convenient way to check and record your spending.
- (7) Since there is a fixed credit limit, a cardholder cannot overstretch his purchases.

9. Online Share Trading

Traditionally stock trading was done through stock brokers personally or through telephones. As number of people trading in stock market increased enormously in last few years, some issues like location constrains, busy phone lines, miss communication etc. started growing in stock broker offices. Then Information technology helped stock brokers to solve those problems by Online Stock Trading method ("Online stock brokers,").

Online stock trading is an internet based stock trading facility where Investor can trade shares through a website without any manual intervention from the broker. It also provides investors with rich, interactive information in real time including market updates, investment research and robust analysis.

Still some people like offline stock trading where the customer calls the broker to enquire about the stock prices. Then the broker asks some personal details to verify his identity. After that customer can order the amount and the price at which he wants to buy a particular stock. The broker places the order on behalf of the customer. Similarly, the customer can also sell the shares in offline mode. And the customer can monitor all these transactions by logging into his account. The main advantage in offline trading is time-saving.

The Securities & Exchange Board of India (SEBI) approved the report on Internet Trading brought out by the SEBI Committee on Internet Based Trading and Services. Internet trading can take place through order routing systems, which will route client orders to exchange trading systems for execution. Thus a client sitting in any part of the country would now be able to trade using the Internet as a medium through brokers' Internet trading systems.

SEBI-registered brokers can introduce Internet based trading after obtaining permission from respective Stock Exchanges.

Internet Trading at NSE:

NSE became the first exchange to grant approval to its members for providing Internet based trading services. In line with SEBI directives, NSE has issued circulars detailing the requirements and procedures to be complied with by members desirous of providing Internet based trading and services.

Application for permission:

Members desirous of applying to the Exchange for permission for providing Internet-based trading services are required to do so in a requisite format. An application shall be treated as

8.32 Strategic Financial Management

complete only after a comprehensive and satisfactory demonstration of the software is given to the Exchange.

Members are also required to submit undertakings in addition to the application form. In respect of members who have already submitted an undertaking for CTCL / Internet based trading in the Capital Market segment, such members shall not be required to submit a separate undertaking for CTCL / Internet based trading in the Futures & Options segment.

Minimum qualification for personnel:

The employees working on Internet based trading are required to have a minimum educational qualification of a degree and have certification in the NCFM – Derivatives Module of the Exchange. Members are required to confirm the same and submit copies of the NCFM certificates at the time of submission of the application for Internet based trading.

Member-client agreement:

Members shall execute an agreement with such clients who wish to avail the Internet trading facilities offered by the member, spelling out all obligations and rights, minimum service standards to be maintained by the member etc. as per model agreement which shall be prepared by the Exchange for this purpose.

Procedures for granting permission for Internet based trading:

The Exchange shall grant permission to members for Internet based trading on a case-by-case basis. Members are fully responsible to procure/develop the software including procurement of computer hardware. The Exchange shall help members to establish the computer to computer link; however the members are fully responsible to implement the solution at their end. Members are solely responsible for all the contracts they enter into with any vendor. The Exchange shall not be liable for any loss, damage or other costs arising in any way out of the failure of the system.

On submission of complete application form, undertaking and charges, the Exchange shall provide the technical specifications (message formats/protocols etc) i.e. APIs for the interface with the Exchange's trading system. A user id on the Exchange's test environment shall be provided to members for the purpose of testing their software.

On completion of development of the software, the member is required to test the software on the NSE trading test environment during a pre-specified time so as to enable the Exchange to monitor the same. The test cases for the final testing shall be provided by the Exchange.

On satisfactory completion of testing on the Exchange test environment, the member is required to give comprehensive demonstration of their website providing the Internet based trading service and the Internet trading software to the Exchange. On finding the website / software to be satisfactory and meeting SEBI / Exchange minimum requirements, the Exchange shall grant permission to the member to commence Internet based trading.

Subsequent to being granted permission, all members are permitted to use only a single user id per VSAT for the purpose of Internet trading on the live environment. Additionally, members shall not be permitted to use the Corporate Manager and Branch Manager user ids' for this purpose.

Testing facility provided by NSE for testing Internet trading software:

The Exchange provides a facility to members for testing their Internet-trading software on the Exchange's testing environment.

Members can avail of the testing environment of the Exchange only till the Exchange grants permission to the member. Subsequent to the members being granted permission by the Exchange to commence trading on live environment using their Internet trading software, the test user id(s) given to them on the testing environment shall be disabled.

Members wishing to avail of the test facility subsequent to being granted permission to commence trading on live environment shall be permitted to do so, on a case-to-case basis subject to the following:

1. Members are required to apply for the test facility giving broadly the reason for the requiring the test facility, duration for which test facility is required, nature of the changes to the software, new functionalities proposed etc.
2. The member is required to give a comprehensive demonstration of the modified software on completion of testing.

The Exchange shall allot not more than 2 user ids per member on the Exchange test environment. The user ids shall be disabled at the end of the testing period requested by the member.

Internet has made it possible for the people to deal in stocks, execute banking related activities, buy-sell products and so on. A large number of people have started trading online and it has become very popular in a short period of time.

It is against a mere 4% in the year 2004, online trades now accounts for more than 12% of its daily turnover on the National Stock Exchange (NSE). The quality of infrastructure has been developed significantly in the recent past connected by high speed networks, buyers and sellers are gathering in virtual market – places and revolutionizing the way business is conducted.

Advantages of Online Trading

- (i) **Time:** Customers can trade online in a real time basis as buying and selling of shares happen with a press of button.
- (ii) **Flexibility:** Customers can modify the placed orders according to the market movements.
- (iii) **Standardized Procedure:** Customer can easily expect the time when cash or shares to be credited to his account.
- (iv) **One stop shop:** Bank statements and transaction statements can be viewed at the click of a button.
- (v) **Informed Research:** Customers can directly see the stock analysis provided by the broker.

8.34 Strategic Financial Management

Disadvantages

- (i) **Limited Knowledge:** Sometimes customers don't have knowledge regarding how to use the online trading portal. And also lack the financial awareness about stock market.
- (ii) **Internet Connectivity:** Online trading requires high speed internet connectivity. But many rural and urban areas don't have this facility today.
- (iii) **Time required:** Customers have to spend lots of time seating in front of terminal to monitor stock prices. It's not suitable for busy professionals.

9

Mutual Funds

Learning Objectives

After going through the chapter student shall be able to understand

- **Basics of Mutual Funds- including its concepts and benefits etc.**
- **Classification of Mutual Funds**
 - (1) Functional Classification
 - (2) Portfolio Classification
 - (3) Ownership Classification
- **Types of Schemes**
 - (1) Balanced Funds
 - (2) Equity Diversified Funds
 - (3) Equity Linked Tax Savings Scheme
 - (4) Sector Funds
 - (5) Thematic Funds
 - (6) Arbitrage Funds
 - (7) Hedge Fund
 - (8) Cash Fund
 - (9) Exchange Traded Funds
- **Key players in Mutual Funds**
 - (1) Sponsor
 - (2) Asset Management Company
 - (3) Trustee
 - (4) Unit Holder
 - (5) Mutual Fund
- **Advantages of Mutual Fund**
- **Drawbacks of Mutual Fund**
- **Evaluating performance of Mutual Funds**
 - (1) Net Asset Value (NAV)

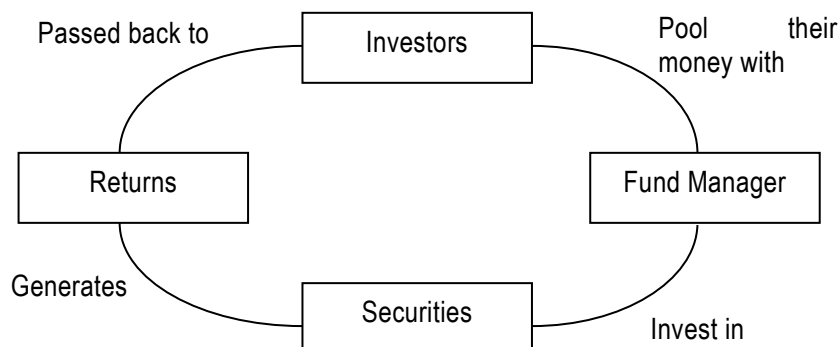
9.2 Strategic Financial Management

- (2) Costs incurred by Mutual Fund
- (3) Computation of Returns
- (4) Holding Period Return (HPR)
- (5) Entry and Exit load in Mutual Fund
- (6) Trail Commission
- **The criteria for evaluating the performance**
 - (1) Sharpe Ratio
 - (2) Treynor Ratio
 - (3) Jensen's Alpha
- **Factors influencing the selection of Mutual Funds**
- **Signals highlighting the exit of the investor from the Mutual Fund Scheme**
- **Money Market Mutual Funds (MMMFS)**
- **Exchange Traded Funds**

1. Introduction

Mutual Fund is a trust that pools together the resources of investors to make a foray into investments in the capital market thereby making the investor to be a part owner of the assets of the mutual fund. The fund is managed by a professional money manager who invests the money collected from different investors in various stocks, bonds or other securities according to specific investment objectives as established by the fund. If the value of the mutual fund investments goes up, the return on them increases and vice versa. The net income earned on the funds, along with capital appreciation of the investment, is shared amongst the unit holders in proportion to the units owned by them. Mutual Fund is therefore an indirect vehicle for the investor investing in capital markets. In return for administering the fund and managing its investment portfolio, the fund manager charges fees based on the value of the fund's assets.

How does a mutual fund work?



1.1 Mutual Benefits: Investing in mutual funds is an expert's job in the present market scenario. A systematic investment in this instrument is bound to give rich dividends in the long-term.

1.2 What is a Mutual Fund: A mutual fund is a trust that pools the savings of a number of investors who share a common financial goal. A mutual fund is the most suitable investment for the cautious investor as it offers an opportunity to invest in a diversified professionally managed basket of securities at a relatively low cost. So, we can say that Mutual Funds are trusts which pool resources from large number of investors through issue of units for investments in capital market instruments such as shares, debentures and bonds and money-market instruments such as commercial papers, certificate of deposits and treasury bonds.

1.3 Who can invest in Mutual Funds: Anybody with an investible surplus of as little as a few thousand rupees can invest in mutual funds by buying units of a particular mutual fund scheme that has a defined investment objective and strategy.

1.4 How Mutual Funds work for you: The money collected from the investors is invested by a fund manager in different types of securities.

These could range from shares and debentures to money market instruments depending upon the scheme's stated objectives.

The income earned through these investments and capital appreciation realized by the scheme are shared by its unit holders in proportion to the units owned by them.

(please refer the above diagram)

1.5 Should we invest in Stocks or Mutual Funds?

As soon as you have set your goals and decided to invest in equity, the question arises is - should you invest in stocks or mutual funds? Well, you need to decide what kind of an investor you are.

First, consider if you have the kind of disposable income to invest in 15-20 stocks. That is how many stocks you will have to invest in if you want to create a well-diversified portfolio. Remember the familiar adage: Do not put all your eggs in one basket? If ₹ 5,000 were all you have to spare, it would be impractical to invest it across many stocks.

Many beginners tend to focus on stocks that have a market price of less than ₹ 100 or ₹ 50; that should never be a criterion for choosing a stock. Also, brokerage could eat into your returns if you purchase small quantities of a stock.

On the other hand, you would be able to gain access to a wide basket of stocks for ₹ 5,000 if you buy into a fund. Investing in funds would also be an easy way to build your equity portfolio over time.

Let's say you can afford to put away only ₹ 1,000 a month in the market. You can simply invest in a fund every month through a systematic investment plan (SIP) as a matter of financial discipline. You can save yourself the trouble of scouting for a stock every month.

That brings us to the next point. Do you have the time to pick stocks? You need to invest a considerable amount of time reading newspapers, magazines, annual reports, quarterly updates, industry reports and talking to people who are familiar with industry practices. Else,

9.4 Strategic Financial Management

you certainly won't catch a trend or pick a stock ahead of the market. How many great investors have you heard of who have not made investing their full-time job?

Plus, you may have the time, but not the inclination. You have to be an active investor, which means continuously monitor the stocks you pick and make changes – buy more, cut exposures – depending upon the turn of events. These actions have costs as well. As you churn your portfolio, you bear expenses such as capital gains tax. Funds do not pay capital gains tax when they sell a stock.

All this assumes you know what you are doing and have the skill to pick the right stocks. You are likely to be better at investing in an industry you understand. Only, too bad if that industry appears to be out of favour in the market.

If you love the thrill and the ups and downs of the stock market offers; if you find yourself turning into business channels and scouring business papers hoping that you can pick the next Infosys; if you have an instinct for spotting stocks and, importantly, the discipline to act on it; if you have the emotional maturity to cut your losses when you are ahead, then you can trust yourself to invest in stocks.

Otherwise, hand over your money to the professional. Mutual funds could be the best avenue for the risk-averse Investors.

2. Classification of Mutual Funds

There are three different types of classification of mutual funds. (1) Functional, (2) Portfolio, and (3) Ownership. Each classification is mutually exclusive.

2.1 Functional Classification: Funds are divided into:

- (1) Open ended funds
- (2) Close ended funds and

In an open-ended scheme, the investor can make entry and exit at any time. Also, the capital of the fund is unlimited and the redemption period is indefinite. On the contrary, in a close ended scheme, the investor can buy into the scheme during Initial Public offering or from the stock market after the units have been listed. The scheme has a limited life at the end of which the corpus is liquidated. The investor can make his exit from the scheme by selling in the stock market, or at the expiry of the scheme or during repurchase period at his option. Interval schemes are a cross between an open ended and a close ended structure. These schemes are open for both purchase and redemption during pre-specified intervals (viz. monthly, quarterly, annually etc.) at prevailing NAV based prices. Interval funds are very similar to close-ended funds, but differ on the following points:

- They are not required to be listed on the stock exchanges, as they have an in-built redemption window.
- They can make fresh issue of units during the specified interval period, at the prevailing NAV based prices.
- Maturity period is not defined.

2.2 Portfolio Classification: Funds are classified into Equity Funds, Debt Funds and Special Funds.

Equity funds invest primarily in stocks. A share of stock represents a unit of ownership in a company. If a company is successful, shareholders can profit in two ways:

- the stock may increase in value, or
- the company can pass its profits to shareholders in the form of dividends.

If a company fails, a shareholder can lose the entire value of his or her shares; however, a shareholder is not liable for the debts of the company.

Equity Funds are of the following types viz.

- (a) **Growth Funds:** They seek to provide long term capital appreciation to the investor and are best to long term investors.
- (b) **Aggressive Funds:** They look for super normal returns for which investment is made in start-ups, IPOs and speculative shares. They are best to investors willing to take risks.
- (c) **Income Funds:** They seek to maximize present income of investors by investing in safe stocks paying high cash dividends and in high yield money market instruments. They are best to investors seeking current income.
- (d) **Balanced Funds:** They are a mix of growth and income funds. They buy shares for growth and bonds for income and best for investors seeking to strike golden mean.

Debt Funds are of two types viz.

- (a) **Bond Funds:** They invest in fixed income securities e.g. government bonds, corporate debentures, convertible debentures, money market. Investors seeking tax free income go in for government bonds while those looking for safe, steady income buy government bonds or high grade corporate bonds. Although there have been past exceptions, bond funds tend to be less volatile than stock funds and often produce regular income. For these reasons, investors often use bond funds to diversify, provide a steady stream of income, or invest for intermediate-term goals. Like stock funds, bond funds have risks and can make or lose money.
- (b) **Gilt Funds:** They are mainly invested in Government securities.

Special Funds are of four types viz.

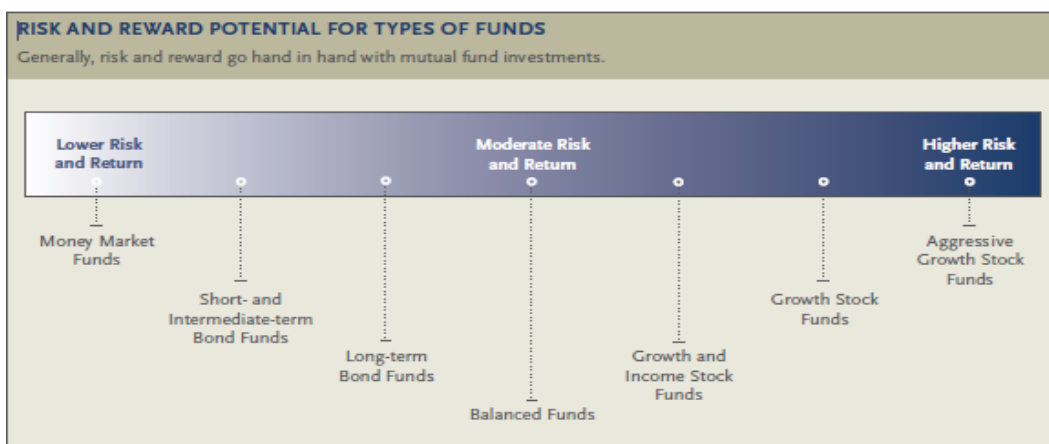
- (a) **Index Funds:** Every stock market has a stock index which measures the upward and downward sentiment of the stock market. Index Funds are low cost funds and influence the stock market. The investor will receive whatever the market delivers.
- (b) **International Funds:** A mutual fund located in India to raise money in India for investing globally.
- (c) **Offshore Funds:** A mutual fund located in India to raise money globally for investing in India.
- (d) **Sector Funds:** They invest their entire fund in a particular industry e.g. utility fund for utility industry like power, gas, public works.
- (e) **Money Market Funds:** These are predominantly debt-oriented schemes, whose main

9.6 Strategic Financial Management

objective is preservation of capital, easy liquidity and moderate income. To achieve this objective, liquid funds invest predominantly in safer short-term instruments like Commercial Papers, Certificate of Deposits, Treasury Bills, G-Secs etc.

These schemes are used mainly by institutions and individuals to park their surplus funds for short periods of time. These funds are more or less insulated from changes in the interest rate in the economy and capture the current yields prevailing in the market.

- (f) **Fund of Funds:** Fund of Funds (FoF) as the name suggests are schemes which invest in other mutual fund schemes. The concept is popular in markets where there are number of mutual fund offerings and choosing a suitable scheme according to one's objective is tough. Just as a mutual fund scheme invests in a portfolio of securities such as equity, debt etc, the underlying investments for a FoF is the units of other mutual fund schemes, either from the same fund family or from other fund houses.
- (g) **Capital Protection Oriented Fund:** The term 'capital protection oriented scheme' means a mutual fund scheme which is designated as such and which endeavours to protect the capital invested therein through suitable orientation of its portfolio structure. The orientation towards protection of capital originates from the portfolio structure of the scheme and not from any bank guarantee, insurance cover etc. SEBI stipulations require these types of schemes to be close-ended in nature, listed on the stock exchange and the intended portfolio structure would have to be mandatory rated by a credit rating agency. A typical portfolio structure could be to set aside major portion of the assets for capital safety and could be invested in highly rated debt instruments. The remaining portion would be invested in equity or equity related instruments to provide capital appreciation. Capital Protection Oriented schemes are a recent entrant in the Indian capital markets and should not be confused with 'capital guaranteed' schemes.
- (h) **Gold Funds:** The objective of these funds is to track the performance of Gold. The units represent the value of gold or gold related instruments held in the scheme. Gold Funds which are generally in the form of an Exchange Traded Fund (ETF) are listed on the stock exchange and offers investors an opportunity to participate in the bullion market without having to take physical delivery of gold.



2.3 Ownership Classification: Funds are classified into Public Sector Mutual Funds, Private Sector Mutual Funds and Foreign Mutual Funds. Public Sector Mutual Funds are sponsored by a company of the public sector. Private Sector Mutual Fund are sponsored by a company of the private sector. Foreign Mutual Funds are sponsored by companies for raising funds in India, operate from India and invest in India.

3. Types of Schemes

3.1 Balanced Funds: Balanced funds make strategic allocation to both debt as well as equities. It mainly works on the premise that while the debt portfolio of the scheme provides stability, the equity one provides growth. It can be an ideal option for those who do not like total exposure to equity, but only substantial exposure. Such funds provide moderate returns to the investors as the investors are neither taking too high risk nor too low a risk.

3.2 Equity Diversified Funds: A Diversified funds is a fund that contains a wide array of stocks. The fund manager of a diversified fund ensures a high level of diversification in its holdings, thereby reducing the amount of risk in the fund.

a. Flexicap/ Multicap Fund: These are by definition, diversified funds. The only difference is that unlike a normal diversified fund, the offer document of a multi-cap/flexi-cap fund generally spells out the limits for minimum and maximum exposure to each of the market caps.

b Contra fund: A contra fund invests in those out-of-favour companies that have unrecognised value. It is ideally suited for investors who want to invest in a fund that has the potential to perform in all types of market environments as it blends together both growth and value opportunities. Investors who invest in contra funds have an aggressive risk appetite.

c. Index fund: An index fund seeks to track the performance of a benchmark market index like the BSE Sensex or S&P CNX Nifty. Simply put, the fund maintains the portfolio of all the securities in the same proportion as stated in the benchmark index and earns the same return as earned by the market.

d. Dividend Yield fund: A dividend yield fund invests in shares of companies having high dividend yields. Dividend yield is defined as dividend per share divided by the share's market price. Most of these funds invest in stocks of companies having a dividend yield higher than the dividend yield of a particular index, i.e., Sensex or Nifty. The prices of dividend yielding stocks are generally less volatile than growth stocks. Besides, they also offer the potential to appreciate.

Among diversified equity funds, dividend yield funds are considered to be a medium-risk proposition. However, it is important to note that dividend yield funds have not always proved resilient in short-term corrective phases. Dividend yield schemes are of two types:

- *Dividend Payout Option:* Dividends are paid out to the unit holders under this option. However, the NAV of the units falls to the extent of the dividend paid out and applicable statutory levies.
- *Dividend Re-investment Option:* The dividend that accrues on units under this option is re-invested back into the scheme at ex-dividend NAV. Hence investors receive additional units on their investments in lieu of dividends.

3.3 Equity Linked Tax Savings Scheme: ELSS is one of the options for investors to save taxes under Section 80 C of the Income Tax Act. They also offer the perfect way to participate in the growth of the capital market, having a lock-in-period of three years. Besides, ELSS has the potential to give better returns than any traditional tax savings instrument.

Moreover, by investing in an ELSS through a Systematic Investment Plan (SIP), one can not only avoid the problem of investing a lump sum towards the end of the year but also take advantage of “averaging”.

3.4 Sector Funds: These funds are highly focused on a particular industry. The basic objective is to enable investors to take advantage of industry cycles. Since sector funds ride on market cycles, they have the potential to offer good returns if the timing is perfect. However, they are bereft of downside risk protection as available in diversified funds.

Sector funds should constitute only a limited portion of one’s portfolio, as they are much riskier than a diversified fund. Besides, only those who have an existing portfolio should consider investing in these funds.

For example, Real Estate Mutual Funds (REMFs) invest in real estate properties and earn income in the form of rentals, capital appreciation from developed properties. Also, some part of the fund corpus is invested in equity shares or debentures of companies engaged in real estate assets or developing real estate development projects. REMFs are required to be close-ended in nature and listed on a stock exchange.

3.5 Thematic Funds: Thematic funds are those mutual funds that invest in various sectors related to a particular theme. For example, if the mutual fund concentrates in infrastructure theme, then it will invest in the equity shares of construction companies, cement companies, steel companies and other companies that are related to the infrastructure sector.

A Thematic fund focuses on trends that are likely to result in the ‘out-performance’ by certain sectors or companies. In other words, the key factors are those that can make a difference to business profitability and market values.

However, the downside is that the market may take a longer time to recognize views of the fund house with regards to a particular theme, which forms the basis of launching a fund.

3.6 Arbitrage Funds: Arbitrage funds are those mutual funds which purchases stock in the cash market (i.e. purchase at spot price or current price of a stock) and simultaneously sell in the futures market. However, the margin between stock prices and futures prices are low. Therefore, arbitrage mutual funds undertake large number of trades to make substantial profit on the difference between cash and futures price.

Typically, these funds promise safety of deposits, but with better returns, tax benefits and greater liquidity.

The open-ended equity scheme aims to generate low volatility returns by investing in a mix of cash equities, equity derivatives and debt markets. The fund seeks to provide better returns than typical debt instruments and lower volatility in comparison to equity.

This fund is aimed at an investor who seeks the return of small savings instruments, safety of bank deposits, tax benefits of RBI relief bonds and liquidity of a mutual fund.

Arbitrage fund finally seeks to capitalize on the price differentials between the spot and the futures market.

3.7 Hedge Fund: Hedge Funds are those funds that collect money from various investors such as banks, insurance firms, high net worth individuals, pension funds etc. They then invest the amount collected in various asset classes such as derivatives, equities, bonds, currencies and convertible securities.

A hedge fund is a lightly regulated investment fund that escapes most regulations by being a sort of a private investment vehicle being offered to selected clients.

The big difference between a hedge fund and a mutual fund is that the former does not reveal any thing about its operations publicly and charges a performance fee. Typically, if it outperforms a benchmark, it takes a cut out of the profits. Of course, this is a one way street, any losses are borne by the investors themselves. Hedge funds are aggressively managed portfolio of investments which use advanced investment strategies such as leveraged, long, short and derivative positions in both domestic and international markets with the goal of generating high returns (either in an absolute sense or over a specified market benchmark). It is important to note that hedging is actually the practice of attempting to reduce risk, but the goal of most hedge funds is to maximize return on investment.

3.8 Cash Fund: Cash Fund is an open-ended liquid scheme that aims to generate returns with lower volatility and higher liquidity through a portfolio of debt and money market instrument.

3.9 Exchange Traded Funds: An Exchange Traded Fund (ETF) is a hybrid product that combines the features of an index fund. These funds are listed on the stock exchanges and their prices are linked to the underlying index. The authorized participants act as market makers for ETFs.

ETFs can be bought and sold like any other stock on an exchange. In other words, ETFs can be bought or sold any time during the market hours at prices that are expected to be closer to the NAV at the end of the day. Therefore, one can invest at real time prices as against the end of the day prices as is the case with open-ended schemes.

There is no paper work involved for investing in an ETF. These can be bought like any other stock by just placing an order with a broker. ETFs may be attractive as investments because of their low costs, tax efficiency, and stock-like features. An ETF combines the valuation feature of a mutual fund or unit investment trust, which can be bought or sold at the end of each trading day for its net asset value, with the tradability feature of a closed-end fund, which trades throughout the trading day at prices that may be more or less than its net asset value. Following types of ETF products are available in the market:

- *Index ETFs* - Most ETFs are index funds that hold securities and attempt to replicate the performance of a stock market index.

9.10 Strategic Financial Management

- *Commodity ETFs* - Commodity ETFs invest in commodities, such as precious metals and futures.
- *Bond ETFs* - Exchange-traded funds that invest in bonds are known as bond ETFs. They thrive during economic recessions because investors pull their money out of the stock market and into bonds (for example, government treasury bonds or those issues by companies regarded as financially stable). Because of this cause and effect relationship, the performance of bond ETFs may be indicative of broader economic conditions.
- *Currency ETFs* - The funds are total return products where the investor gets access to the forex spot change, local institutional interest rates and a collateral yield.

4. Key Players in Mutual Funds

Mutual Fund is formed by a trust body. The business is set up by the sponsor, the money invested by the asset management company and the operations monitored by the trustee. There are five principal constituents and three market intermediaries in the formation and functioning of mutual fund. There are five constituents of Mutual Fund which are as follows:

4.1 Sponsor: A company established under the Companies Act forms a mutual fund.

4.2 Asset Management Company: It is an entity registered under the Companies Act to manage the money invested in the mutual fund and to operate the schemes of the mutual fund as per mutual fund regulations. It carries the responsibility of investing and managing the investors' money. Professional money managers are appointed by the asset management company to take care that the investor's corpus are invested in profitable securities based on the risk appetite of the investors and according to the mutual fund scheme. The AMC typically has three departments viz. (a) Fund Management (b) Sales & marketing (c) Operations & Accounting.

4.3 Trustee: The trust is headed by Board of Trustees. The trustee holds the property of the mutual fund in trust for the benefit of unit holders and looks into the legal requirements of operating and functioning of the mutual fund. The trustee may also form a limited company under the Companies Act in some situations. The trustees have the duty to monitor the actions of the AMC to ensure compliance with the SEBI regulations and to see that the decisions of the AMC are not against the interests of the unit holders.

4.4 Unit Holder: A person/entity holding an undivided share in the assets of a mutual fund scheme.

4.5 Mutual Fund: A mutual fund established under the Indian Trust Act to raise money through the sale of units to the public for investing in the capital market. The funds thus collected are passed on to the Asset Management Company for investment. The mutual fund has to be registered with SEBI.

The three market intermediaries are:

(a) Custodian; (b) Transfer Agents; (c) Depository.

- (a) **Custodian:** A custodian is a person who has been granted a Certificate of Registration to conduct the business of custodial services under the SEBI (Custodian of Securities) Regulations 1996. Custodial services include safeguarding clients' securities along with incidental services provided. Maintenance of accounts of clients' securities together with the collection of benefits / rights accruing to a client falls within the purview of custodial service. Mutual funds require custodians so that AMC can concentrate on areas such as investment and management of money.
- (b) **Transfer Agents:** A transfer agent is a person who has been granted a Certificate of Registration to conduct the business of transfer agent under SEBI (Registrars to an Issue and Share Transfer Agents) Regulations Act 1993. Transfer agents' services include issue and redemption of mutual fund units, preparation of transfer documents and maintenance of updated investment records. They also record transfer of units between investors where depository does not function.
- (c) **Depository:** Under the Depositories 1996, a depository is body corporate who carries out the transfer of units to the unit holder in dematerialised form and maintains records thereof.

5. Advantages of Mutual Fund

- (a) **Professional Management:** The funds are managed by skilled and professionally experienced managers with the backup of a Research team.
- (b) **Diversification:** Mutual Funds offer diversification in portfolio which reduces the risk.
- (c) **Convenient Administration:** There are no administrative risks of share transfer, as many of the Mutual Funds offer services in a demat form which save investor's time and delay.
- (d) **Higher Returns:** Over a medium to long-term investment, investors always get higher returns in Mutual Funds as compared to other avenues of investment. This is already seen from excellent returns, Mutual Funds have provided in the last few years. However, investors are cautioned that such high returns riding on the IT boom should not be taken as regular returns and therefore one should look at the average returns provided by the Mutual Funds particularly in the equity schemes during the last couple of years.
- (e) **Low Cost of Management:** No Mutual Fund can increase the cost beyond prescribed limits of 2.5% maximum and any extra cost of management is to be borne by the AMC.
- (f) **Liquidity:** In all the open ended funds, liquidity is provided by direct sales / repurchase by the Mutual Fund and in case of close ended funds, the liquidity is provided by listing the units on the Stock Exchange.
- (g) **Transparency:** The SEBI Regulations now compel all the Mutual Funds to disclose their portfolios on a half-yearly basis. However, many Mutual Funds disclose this on a quarterly or monthly basis to their investors. The NAVs are calculated on a daily basis in case of open ended funds and are now published through AMFI in the newspapers.
- (h) **Other Benefits:** Mutual Funds provide regular withdrawal and systematic investment

9.12 Strategic Financial Management

plans according to the need of the investors. The investors can also switch from one scheme to another without any load.

- (i) **Highly Regulated:** Mutual Funds all over the world are highly regulated and in India all Mutual Funds are registered with SEBI and are strictly regulated as per the Mutual Fund Regulations which provide excellent investor protection.
- (j) **Economies of scale:** The way mutual funds are structured gives it a natural advantage. The “pooled” money from a number of investors ensures that mutual funds enjoy economies of scale; it is cheaper compared to investing directly in the capital markets which involves higher charges. This also allows retail investors access to high entry level markets like real estate, and also there is a greater control over costs.
- (k) **Flexibility:** There are a lot of features in a regular mutual fund scheme, which imparts flexibility to the scheme. An investor can opt for Systematic Investment Plan (SIP), Systematic Withdrawal Plan etc. to plan his cash flow requirements as per his convenience. The wide range of schemes being launched in India by different mutual funds also provides an added flexibility to the investor to plan his portfolio accordingly.

6. Drawbacks of Mutual Fund

- (a) **No guarantee of Return** – There are three issues involved:
 - (i) All Mutual Funds cannot be winners. There may be some who may under perform the benchmark index i.e. it may not even perform well as a novice who invests in the stocks constituting the index.
 - (ii) A mutual fund may perform better than the stock market but this does not necessarily lead to a gain for the investor. The market may have risen and the mutual fund scheme increased in value but the investor would have got the same increase had he invested in risk free investments than in mutual fund.
 - (iii) Investors may forgive if the return is not adequate. But they will not do so if the principal is eroded. Mutual Fund investment may depreciate in value.
- (b) **Diversification** – A mutual fund helps to create a diversified portfolio. Though diversification minimises risk, it does not ensure maximizing returns. The returns that mutual funds offer are less than what an investor can achieve. For example, if a single security held by a mutual fund doubles in value, the mutual fund itself would not double in value because that security is only one small part of the fund's holdings. By holding a large number of different investments, mutual funds tend to do neither exceptionally well nor exceptionally poorly.
- (c) **Selection of Proper Fund** – It may be easier to select the right share rather than the right fund. For stocks, one can base his selection on the parameters of economic, industry and company analysis. In case of mutual funds, past performance is the only criterion to fall back upon. But past cannot predict the future.
- (d) **Cost Factor** – Mutual Funds carry a price tag. Fund Managers are the highest paid executives. While investing, one has to pay for trail commission and when leaving he has

to pay for exit load. Such costs reduce the return from mutual fund. The fee paid to the Asset Management Company is in no way related to performance.

- (e) **Unethical Practices** – Mutual Funds may not play a fair game. Each scheme may sell some of the holdings to its sister concerns for substantive notional gains and posting NAVs in a formalized manner.
- (f) **Taxes** – When making decisions about your money, fund managers do not consider your personal tax situations. For example when a fund manager sells a security, a capital gain tax is triggered, which affects how profitable the individual is from sale. It might have been more profitable for the individual to defer the capital gain liability.
- (g) **Transfer Difficulties** – Complications arise with mutual funds when a managed portfolio is switched to a different financial firm. Sometimes the mutual fund positions have to be closed out before a transfer can happen. This can be a major problem for investors. Liquidating a mutual fund portfolio may increase risk, increase fees and commissions, and create capital gains taxes.

7. Evaluating the Performance of Mutual Funds

(1) **Net Asset Value (NAV):** It is the amount which a unit holder would receive if the mutual fund were wound up. An investor in mutual fund is a part owner of all its assets and liabilities. Returns to the investor are determined by the interplay of two elements Net Asset Value and Costs of Mutual Fund. Net Asset Value is the mutual fund’s calling card. It is the basis for assessing the return that an investor has earned. There are three aspects which need to be highlighted:

- (i) It is the net value of all assets less liabilities. NAV represents the market value of total assets of the Fund less total liabilities attributable to those assets.
- (ii) NAV changes daily. The value of assets and liabilities changes daily. NAV today will not be NAV tomorrow or day later.
- (iii) NAV is computed as a value per unit of holding.

Asset Values: Valuation Rule

Nature of Asset	Valuation Rule
Liquid Assets e.g. cash held	As per books.
All listed and traded securities (other than those held as not for sale)	Closing Market Price
Debentures and Bonds	Closing traded price or yield
Illiquid shares or debentures	Last available price or book value whichever is lower. Estimated Market Price approach to be adopted if suitable benchmark is available.
Fixed Income Securities	Current Yield.

9.14 Strategic Financial Management

Netting the Asset Values

The asset values obtained from above have to be adjusted as follows :

Additions	Deductions for Liabilities
Dividends and Interest accrued	Expenses accrued
Other receivables considered good	Liabilities towards unpaid assets
Other assets (owned assets)	Other short term or long term liabilities

Computation of NAV

Net Asset Value (NAV) is value of net assets of the funds. The investor's subscription is treated as the unit capital in the balance sheet of the fund and the investments on their behalf are treated as assets. The funds net assets are defined as the assets less liabilities.

$$\text{NAV} = \frac{\text{Net asset of the scheme}}{\text{Number of units outstanding}}$$

where net assets of the scheme is defined as below -

Net Assets of the Scheme = Market value of investments + Receivables + Other accrued income + other assets - Accrued Expenses - Other Payables - Other Liabilities

Illustration 1

Based on the following data, determine the NAV of a Regular Income Scheme

	₹ (in lakhs)
Listed Shares at cost (ex-dividend)	20.00
Cash in hand	1.23
Bonds and Debentures at cost	4.30
Of these, Bonds not listed and quoted	1.00
Other fixed interest securities at cost	4.50
Dividend accrued	0.80
Amounts payable on shares	6.32
Expenditure accrued	0.75
Number of Units (₹ 10 F.V. each)	2,40,000

All the listed shares were purchased at a time when index was 1200. On NAV date, the index is ruling at 2120. Listed bonds and debentures carry a market value of ₹ 5 (lakhs) on NAV date. Current realizable value of fixed income securities of F.V. of ₹ 100 is ₹ 106.50.

Solution

Particulars of assets at cost (or liabilities)	Adjustment	Value (₹ In lakhs)
Equity shares	Index $(\frac{2120}{1200}) \times 20$	35.33
Cash in hand	Book Value	1.23
Bonds and Debentures not listed	Book Value	1.00
Bonds and Debentures listed	Market Value	5.00
Dividends accrued		0.80
Fixed Income Securities	MV $(\frac{106.50}{100} \times 4.50)$	4.7925
Sub Total Assets (A)		48.1525
Less : Liabilities		6.32
Due on shares		
Expenses Payable	Accrual Basis	0.75
Sub Total Liabilities (B)		7.07
Net Asset Value (A) – (B)		41.0825
Units under the scheme	Number	2,40,000
Net Asset Value	Per Unit	₹ 17.12

(2) Costs incurred by Mutual Fund: Costs when high reduce the returns of an investor. High Costs are the cause of below par performance of some mutual funds. Costs carry two components:

- (1) Initial Expenses attributable to establishing a scheme under a Fund and
- (2) Ongoing recurring expenses (Management Expense Ratio) which is made up of (a) Cost of employing technically sound investment analysts (b) Administrative Costs (c) Advertisement Costs involving promotion and maintenance of Scheme funds. The Management Expense Ratio is measured as a % of average value of assets during the relevant period.

Expense Ratio = Expense / Average value of Portfolio

If Expenses are expressed per unit, then Expense Ratio = Expenses incurred per unit / Average Net Value of Assets

The Expense Ratio relates to the extent of assets used to run the Mutual Fund. It is inclusive of travel cost, management consultancy and advisory fees. It however excludes brokerage expenses for trading as purchase is recorded with brokerage while sales are recorded without brokerage.

9.16 Strategic Financial Management

(3) Computations of Returns: Investors derive three types of income from owning mutual fund units

1. Cash Dividend
2. Capital Gains Disbursements
3. Changes in the fund's NAV per unit (Unrealised Capital Gains)

For an investor who holds a mutual fund for one year, the one-year holding period return is given by

$$\text{Return} = \text{Dividend} + \text{Realised Capital Gains} + \text{Unrealised Capital Gains} / \text{Base Net Asset Value} \\ = D_1 + CG_1 + (\text{NAV}_1 - \text{NAV}_0) / \text{NAV}_0 \times 100$$

Where $D_1 \rightarrow$ Dividend, $CG_1 \rightarrow$ Realised Capital Gains, $\text{NAV}_1 - \text{NAV}_0 \rightarrow$ Unrealised Capital Gains, $\text{NAV}_0 \rightarrow$ Base Net Asset Value.

Illustration 2

A mutual fund, that had a net asset value of ₹ 10 at the beginning of the month, made income and capital gain distribution of ₹ 0.05 and ₹ 0.04 per unit respectively during the month and then ended the month with a net asset value of ₹ 10.03. Compute the monthly return.

Solution

Given $D_1 = 0.05$, $CG_1 = 0.04$, Unrealised Capital Gains = $\text{NAV}_1 - \text{NAV}_0 = ₹ 10.03 - ₹ 10.00 = ₹ 0.03$.

Monthly Return = $(0.05 + 0.04 + 0.03) / 10 \times 100 = 1.2\%$.

Illustration 3

A mutual fund's opening NAV is ₹ 20 and its closing NAV is ₹ 24. If the expense per unit is ₹ 0.50, what is the expense ratio?

Solution

$$\text{Expense Ratio} = (\text{Expense incurred per unit} / \text{Average NAV}) \\ = 0.50 / (20+24) / 2 = 2.27$$

Illustration 4

A mutual fund raised ₹ 150 lakhs on April 1, by issue of 15 lakh units at ₹ 10 per unit. The fund invested in several capital market instruments to build a portfolio of ₹ 140 lakhs. Initial expense amounted to ₹ 8 lakhs. During the month of April, the fund sold certain securities costing ₹ 44.75 lakhs for ₹ 47 lakhs and purchased certain other securities for ₹ 41.6 lakhs. The fund management expenses for the month amounted to ₹ 6 lakhs of which ₹ 50,000 was in arrears. The dividend earned was ₹ 1.5 lakhs. 80% of the realized earnings were distributed. The market value of the portfolio on 30th April was ₹ 147.85 lakhs.

An investor subscribed to 1 unit on April 1 and disposed it off at closing NAV on 30th April. Determine his annual rate of earning.

Solution

	Amount in ₹ lakhs	Amount in ₹ lakhs	Amount in ₹ lakhs
Opening Bank (150-140-8)	2.00		
Add: Proceeds from sale of securities	47.00		
Add: Dividend received	<u>1.50</u>	50.50	
Deduct:			
Cost of securities purchased	41.60		
Fund management expenses paid (6.0 - 0.5)	5.50		
Capital gains distributed = 80% of (47.00 - 44.75)	1.80		
Dividend distributed = 80% of 1.5	1.20	<u>50.10</u>	
Closing Bank			0.40
Closing market value of portfolio			<u>147.85</u>
			148.25
Less: Arrears of expenses			<u>0.50</u>
Closing Net Assets			147.75
Number of units (Lakhs)			15.00
Closing NAV per unit			9.85

Rate of Earning

	Amount
Income received (1.8+1.2)/15	0.20
Less: Loss on disposal (10-9.85)	0.15
Net earning	0.05
Initial investment	10.00
Rate of earning (monthly)	0.5%
Rate of earning (Annual)	6%

(4) Holding Period Return (HPR): A simple but effective measure of performance is to describe mutual fund return in terms of the following three major sources:

- (a) Dividend Earned
- (b) Capital Gain Distribution/ Earned
- (a) Change in price or NAV.

In case investment is held for a period less than one year, then pay offs can be easily converted into returns by using Holding Period Return (HPR) formula, which is as follows:

$$\text{HPR} = \frac{(\text{NAV}_1 - \text{NAV}_0) + \text{Capital Gain Distribution/ Earned} + \text{Dividend/Regular Income Received}}{\text{NAV}_0}$$

9.18 Strategic Financial Management

Illustration 5

A mutual fund that had a net asset value of ₹ 20 at the beginning of month - made income and capital gain distribution of Re. 0.0375 and Re. 0.03 per share respectively during the month, and then ended the month with a net asset value of ₹ 20.06. Calculate monthly return

Solution

Calculation of monthly return on the mutual funds:

$$r = \left[\frac{(\text{NAV}_t - \text{NAV}_{t-1}) + I_t + G_t}{\text{NAV}_{t-1}} \right]$$

Where,

r = Return on the mutual fund

NAV_t = Net assets value at time period t

NAV_{t-1} = Net assets value at time period $t - 1$

I_t = Income at time period t

G_t = Capital gain distribution at time period t

$$\begin{aligned} &= \left[\frac{(\text{₹ } 20.06 - \text{₹ } 20.00) + (\text{₹ } 0.0375 + \text{₹ } 0.03)}{20} \right] \\ &= \frac{0.06 + 0.0675}{20} \\ &= \frac{0.1275}{20} = 0.006375 \end{aligned}$$

or $r = 0.6375\%$ p.m.

or say = 7.65% p.a.

However, in most of the cases it has been found that the dividend and capital gains are reinvested, in such cases question arises how to obtain a measure of return when investor receives his/her (dividend and capital gains) payouts in form of additional shares or units rather than cash. In such cases, the formula for the calculating the HPR discussed above shall be slightly modified with only difference that to keep a track of number of units acquired through reinvestment. We can use the following formula for calculating the HPR in such cases:

$$\frac{(\text{No. of units at end of Period} \times \text{Ending Price}) - (\text{No. of units at beginning of Period} \times \text{Initial Price})}{\text{No. of units at beginning of Period} \times \text{Initial Price}}$$

Illustration 6

Mr. X, an investor purchased 200 units of ABC Mutual Fund at rate of ₹ 8.50 p.u., one year ago. Over the year Mr. X received ₹ 0.90 as dividend and had received a capital gains distribution of ₹ 0.75 per unit.

You are required to find out:

- (a) Mr. X's holding period return assuming that this no load fund has a NAV of ₹ 9.10 as on today.
 (b) Mr. X's holding period return, assuming all the dividends and capital gains distributions are reinvested into additional units as at average price of ₹ 8.75 per unit.

Solution

- (a) Return for the year (all changes on a per unit basis):

Change in Price (₹ 9.10 - ₹ 8.50)	₹ 0.60
Dividends received	₹ 0.90
Capital gains distributions	₹ 0.75
Total return	₹ 2.25

$$\text{Holding period return} = \frac{\text{₹ 2.25}}{\text{₹ 8.50}} = 26.47\%$$

- (b) When all dividends and capital gains distributions are reinvested into additional units of the fund (₹ 8.75/unit):

Dividends and capital gains per unit:	₹ 0.90 + ₹ 0.75	= ₹ 1.65
Total amount received from 200 units:	₹ 1.65 X 200	= ₹ 330.00
Additional units added:	₹ 330/₹ 8.75	= 37.7 units
Value of 237.7 units held at end of year:	237.7 units X ₹ 9.10	= ₹ 2,163
Price paid for 200 units at beginning of year	200 units X ₹ 8.50	= ₹ 1,700

Thus, the Holding Period Return would be:

$$= \frac{(\text{No. of units at end of Period} \times \text{Ending Price}) - (\text{No. of units at beginning of Period} \times \text{Initial Price})}{\text{No. of units at beginning of Period} \times \text{Initial Price}}$$

$$\text{H.P.R.} = \frac{\text{₹ 2,163} - \text{₹ 1,700}}{\text{₹ 1,700}} = \frac{\text{₹ 463}}{\text{₹ 1,700}} = 27.24\%$$

(5) Entry and Exit Load in Mutual Funds

Some Asset Management Companies (AMCs) have sales charges, or loads, on their funds (entry load and/or exit load) to compensate for distribution costs. Funds that can be purchased without a sales charge are called no-load funds.

Entry load is charged at the time an investor purchases the units of a scheme. The entry load percentage is added to the prevailing NAV at the time of allotment of units.

Exit load is charged at the time of redeeming (or transferring an investment between schemes). The exit load percentage is deducted from the NAV at the time of redemption (or transfer between schemes). This amount goes to the Asset Management Company and not

9.20 Strategic Financial Management

into the pool of funds of the scheme. In simple terms, therefore, Entry and Exit Load in Mutual Fund are the charges one pays while buying and selling the fund respectively.

Illustration 7

Mr. X earns 10% on his investments in equity shares. He is considering a recently floated scheme of a Mutual Fund where the initial expenses are 6% and annual recurring expenses are expected to be 2%. How much the Mutual Fund scheme should earn to provide a return of 10% to Mr. X?

Solution

$$r_2 = \frac{1}{1 - \text{initial exp}} \times r_1 + \text{recurring exp.}$$

The rate of return the mutual fund should earn;

$$= \frac{1}{1 - 0.06} \times 0.1 + 0.02$$

$$= 0.1264 \text{ or } 12.64\%$$

(6) Trail Commission

It is the amount that a mutual fund investor pays to his advisor each year. The purpose of charging this commission from the investor is to provide incentive to the advisor to review their customer's holdings and to give advice from time to time.

Distributors usually charge a trail commission of 0.3-0.75% on the value of the investment for each year that the investor's money remains invested with the fund company. This is calculated on a daily basis as a percentage of the assets under management of the distributor and is paid monthly. This is separate from any upfront commission that is usually paid by the fund company to the distributor out of its own pocket.

8. The Criteria for Evaluating the Performance

8.1 Sharpe Ratio: This ratio measures the return earned in excess of the risk free rate (normally Treasury instruments) on a portfolio to the portfolio's total risk as measured by the standard deviation in its returns over the measurement period. Nobel Laureate William Sharpe developed the model and the results of it indicate the amount of return earned per unit of risk. The Sharpe ratio is often used to rank the risk-adjusted performance of various portfolios over the same time. The higher a Sharpe ratio, the better a portfolio's returns have been relative to the amount of investment risk the investor has taken. The major advantage of using the Sharpe ratio over other models (CAPM) is that the Sharpe ratio uses the volatility of the portfolio return instead of measuring the volatility against a benchmark (i.e., index). The primary disadvantage of the Sharpe ratio is that it is just a number and it is meaningless unless you compare it to several other types of portfolios with similar objectives

$$S = \frac{\text{Return portfolio} - \text{Return of Risk free investment}}{\text{Standard Deviation of Portfolio}}$$

Example: Let's assume that we look at a one year period of time where an index fund earned 11%

Treasury bills earned 6%

The standard deviation of the index fund was 20%

Therefore $S = 11 - 6 / .20 = 25\%$

The Sharpe ratio is an appropriate measure of performance for an overall portfolio particularly when it is compared to another portfolio, or another index such as the S&P 500, Small Cap index, etc.

That said however, it is not often provided in most rating services.

Example: Consider two funds A and B. Let return of fund A be 30% and that of fund B be 25%. On the outset, it appears that fund A has performed better than Fund B. Let us now incorporate the risk factor and find out the Sharpe ratios for the funds. Let risk of Fund A and Fund B be 11% and 5% respectively. This means that the standard deviation of returns - or the volatility of returns of Fund A is much higher than that of Fund B.

If risk free rate is assumed to be 8%,

Sharpe ratio for fund A = $(30 - 8) / 11 = 2\%$ and

Sharpe ratio for fund B = $(25 - 8) / 5 = 3.4\%$

Higher the Sharpe Ratio, better is the fund on a risk adjusted return metric. Hence, our primary judgment based solely on returns was erroneous. Fund B provides better risk adjusted returns than Fund A and hence is the preferred investment. Producing healthy returns with low volatility is generally preferred by most investors to high returns with high volatility. Sharpe ratio is a good tool to use to determine a fund that is suitable to such investors.

8.2 Treynor Ratio: This ratio is similar to the above except it uses beta instead of standard deviation. It's also known as the Reward to Volatility Ratio, it is the ratio of a fund's average excess return to the fund's beta. Treynor ratio evaluates the performance of a portfolio based on the systematic risk of a fund. Treynor ratio is based on the premise that unsystematic or specific risk can be diversified and hence, only incorporates the systematic risk (beta) to gauge the portfolio's performance. It measures the returns earned in excess of those that could have been earned on a riskless investment per unit of market risk assumed. The formula is typically used in ranking Mutual Funds with similar objectives.

$$T = \frac{\text{Return of Portfolio} - \text{Return of Risk Free Investment}}{\text{Beta of Portfolio}}$$

The absolute risk adjusted return is the Treynor plus the risk free rate.

In the illustration discussed earlier, beta of Fund A and B are 1.5 and 1.1 respectively,

Treynor ratio for fund A = $(30 - 8) / 1.5 = 14.67\%$

Treynor ratio for fund B = $(25 - 8) / 1.1 = 15.45\%$

The results are in sync with the Sharpe ratio results.

9.22 Strategic Financial Management

Both Sharpe ratio and Treynor ratio measure risk adjusted returns. The difference lies in how risk is defined in either case. In Sharpe ratio, risk is determined as the degree of volatility in returns - the variability in month-on-month or period-on-period returns - which is expressed through the standard deviation of the stream of returns numbers you are considering. In Treynor ratio, you look at the beta of the portfolio - the degree of "momentum" that has been built into the portfolio by the fund manager in order to derive his excess returns. High momentum - or high beta (where beta is > 1) implies that the portfolio will move faster (up as well as down) than the market.

While Sharpe ratio measures total risk (as the degree of volatility in returns captures all elements of risk - systematic as well as unsystemic), the Treynor ratio captures only the systematic risk in its computation.

When one has to evaluate the funds which are sector specific, Sharpe ratio would be more meaningful. This is due to the fact that unsystematic risk would be present in sector specific funds. Hence, a truer measure of evaluation would be to judge the returns based on the total risk.

On the contrary, if we consider diversified equity funds, the element of unsystematic risk would be very negligible as these funds are expected to be well diversified by virtue of their nature. Hence, Treynor ratio would be more apt here.

It is widely found that both ratios usually give similar rankings. This is based on the fact that most of the portfolios are fully diversified. To summarize, we can say that when the fund is not fully diversified, Sharpe ratio would be a better measure of performance and when the portfolio is fully diversified, Treynor ratio would better justify the performance of a fund.

Example: In 2005 - 06 where Fidelity Magellan had earned about 18%, many bond funds had earned 13%. Which is better? In absolute numbers, 18% beats 13%. But if we then state that the bond funds had about half the market risk, now which is better? We don't even need to do the formula for that analysis. But that is missing in almost all reviews by all brokers. For clarification we do not suggest they put all the money into either one - just that they need to be aware of the implications.

8.3 Jensen's Alpha: This is the difference between a fund's actual return and those that could have been made on a benchmark portfolio with the same risk - i.e. beta. It measures the ability of active management to increase returns above those that are purely a reward for bearing market risk. Caveats apply however since it will only produce meaningful results if it is used to compare two portfolios which have similar betas.

Assume Two Portfolios

	A	B	Market Return
Return	12	14	12
Beta	0.7	1.2	1.0

Risk Free Rate = 9%

The return expected = Risk Free Return + Beta portfolio (Return of Market - Risk Free Return)

Using Portfolio A, the expected return = $0.09 + 0.7(0.12 - 0.09) = 0.09 + 0.021 = 0.111$

Alpha = Return of Portfolio - Expected Return = $0.12 - 0.111 = 0.009$

As long as “apples are compared to apples”- in other words a computer sector fund A to computer sector fund b- it is a viable number. But if taken out of context, it loses meaning. Alphas are found in many rating services but are not always developed the same way- so you can't compare an alpha from one service to another. However, we have usually found that their relative position in the particular rating service is to be viable. Short-term alphas are not valid. Minimum time frames are one year- three years is more preferable.

8.4 Expense Ratio: It is the percentage of the assets that were spent to run a mutual fund. It includes things like management and advisory fees, travel costs and consultancy fees. The expense ratio does not include brokerage costs for trading the portfolio. It is also referred to as the Management Expense Ratio (MER).

If one pays a close attention to the expense ratio, it can sometimes be as high as 2-3% which can seriously undermine the performance of one's mutual fund.

8.5 Tracking Error: When the returns on a mutual fund vary with its corresponding benchmark market index, it is generally called a tracking error. Since, tracking error gives an investor a feeling of how volatile his portfolio is in comparison to its benchmark, it is basically reported by index funds.

In other words, tracking error can also be arrived at by deducting fund's returns from the return of the index it is tracking. However, tracking error is all about deviation and can be statistically defined. Therefore, tracking error is the standard deviation of the difference between the returns of the fund and its corresponding benchmark market index and is computed as follows:

Moreover, an index mutual fund is a passive investment avenue because it is benchmarked to popular stock market indexes such as S&P BSE Sensex. Since the index funds entirely follow their benchmark index, the fund manager's role is almost negligible in this regard. Generally, the fund managers are very upbeat about their fund's return but not so in case of index funds.

The construction of the portfolio of index funds is such that, theoretically, they are always expected to move in tandem with the benchmark index. However, factors such as change in constituents of index, cash holdings, expense ratio and excessive volatility can impact tracking error. For example, an announcement is to be made by the stock exchange of a reconstitution of its index in the next 30 days. The effect of this news is that the stock that is moved out will show immediate reduction in its value. On the other hand, the newly added fund will show increase in its value.

However, the fund manager, in this situation cannot immediately rejig the fund's portfolio. When the reconstitution officially happens, only then the change can be made by the fund manager.

9. Factors Influencing the Selection of Mutual Funds

(1) **Past Performance** – The Net Asset Value is the yardstick for evaluating a Mutual Fund.

9.24 Strategic Financial Management

The higher the NAV, the better it is. Performance is based on the growth of NAV during the referral period after taking into consideration Dividend paid.

$$\text{Growth} = (\text{NAV}_1 - \text{NAV}_0) + D_1 / \text{NAV}_0.$$

(2) **Timing** – The timing when the mutual fund is raising money from the market is vital. In a bullish market, investment in mutual fund falls significantly in value whereas in a bearish market, it is the other way round where it registers growth. The turns in the market need to be observed.

(3) **Size of Fund** – Managing a small sized fund and managing a large sized fund is not the same as it is not dependent on the product of numbers. Purchase through large sized fund may by itself push prices up while sale may push prices down, as large funds get squeezed both ways. So it is better to remain with medium sized funds.

(4) **Age of Fund** – Longevity of the fund in business needs to be determined and its performance in rising, falling and steady markets have to be checked. Pedigree does not always matter as also success strategies in foreign markets.

(5) **Largest Holding** – It is important to note where the largest holdings in mutual fund have been invested.

(6) **Fund Manager** – One should have an idea of the person handling the fund management. A person of repute gives confidence to the investors.

(7) **Expense Ratio** – SEBI has laid down the upper ceiling for Expense Ratio. A lower Expense Ratio will give a higher return which is better for an investor.

(8) **PE Ratio** – The ratio indicates the weighted average PE Ratio of the stocks that constitute the fund portfolio with weights being given to the market value of holdings. It helps to identify the risk levels in which the mutual fund operates.

(9) **Portfolio Turnover** – The fund manager decides as to when he should enter or quit the market. A very low portfolio turnover indicates that he is neither entering nor quitting the market very frequently. A high ratio, on the other hand, may suggest that too frequent moves have lead the fund manager to miss out on the next big wave of investments. A simple average of the portfolio turnover ratio of peer group updated by mutual fund tracking agencies may serve as a benchmark. The ratio is lower of annual purchase plus annual sale to average value of the portfolio.

10. Signals Highlighting the Exit of the Investor from the Mutual Fund Scheme

(1) When the mutual fund consistently under performs the broad based index, it is high time that it should get out of the scheme. It would be better to invest in the index itself either by investing in the constituents of the index or by buying into an index fund.

(2) When the mutual fund consistently under performs in comparison to its peer group instead of it being at the top. In such a case, it would have to pay to get out of the scheme and then invest in the winning schemes.

(3) When the mutual fund changes its objectives e.g. instead of providing a regular income

to the investor, the composition of the portfolio has changed to a growth fund mode which is not in tune with the investor's risk preferences.

(4) When the investor changes his objective of investing in a mutual fund which no longer is beneficial to him.

(5) When the fund manager, handling the mutual fund schemes, has been replaced by a new entrant whose image is not known.

11. Money Market Mutual Funds (MMMFS)

The Government of India thought of introducing Money Market Mutual Funds (MMMFs) on Indian financial canvass in 1992. The aim of the Government was to develop the money market and to enable individual investors to gain from money market instruments since it is practically impossible for individuals to invest in instruments like Commercial Papers (CPs), Certificate of deposits (CDs) and Treasury bills (TBs) which require huge investments. The Government constituted a Task Force on MMMFs under the chairmanship of Shri D. Basu.

The broad framework of guidelines in respect of MMMFs issued by RBI are as follows:

- ◆ The investment by individuals and other bodies would be in the form of negotiable and transferable instruments and MMMF deposit accounts.
- ◆ The minimum investments would be ₹ one lakh.
- ◆ The re-purchase would be subject to a minimum lock-in-period of 3 months.
- ◆ The funds will not be subject to reserve requirements as these will be invested in money market instruments.
- ◆ Minimum of 20 per cent of funds will be invested in 182 days treasury bills.
- ◆ Maximum of 20 per cent of funds will be diverted to call money markets.

Money market funds are generally the safest and most secure of mutual fund investments. The goal of a money-market fund is to preserve principal while yielding a modest return. Money-market mutual fund is akin to a high-yield bank account but is not entirely risk free. When investing in a money-market fund, attention should be paid to the interest rate that is being offered.

12. Exchange Traded Funds

Exchange Traded Funds are a type of financial instrument whose unique advantages over mutual funds have caught the eye of many investors.

12.1 What is an Exchange Traded Fund

An Exchange Traded Fund (ETF) is a hybrid product that combines the features of an index fund. These funds are listed on the stock exchanges and their prices are linked to the underlying index. The authorized participants act as market makers for ETFs.

ETFs can be bought and sold like any other stock on an exchange. In other words, ETFs can be bought or sold any time during the market hours at prices that are expected to be closer to

9.26 Strategic Financial Management

the NAV at the end of the day. Therefore, one can invest at real time prices as against the end of the day prices as is the case with open-ended schemes.

There is no paper work involved for investing in an ETF. These can be bought like any other stock by just placing an order with a broker.

An exchange-traded fund trades like a stock. Just like an index fund, an exchange traded funds represents a basket of stocks that reflect an index such as the Nifty, BSE, S&P 500 in global market. An exchange traded fund, however, isn't a mutual fund; it trades just like any other company on a stock exchange. Unlike a mutual fund that has its net-asset value (NAV) calculated at the end of each trading day, an exchange traded funds's price changes throughout the day, fluctuating with supply and demand. It is important to remember that while exchange traded funds attempt to replicate the return on indexes, there is no guarantee that they will do so exactly. It is not uncommon to see a 1% or more difference between the actual index's year-end return and that of an exchange traded funds.

Exchange Traded Funds (ETF) is a type of passive fund because of following reasons:

- (i) Serves as a good platform for an investor who desires to invest in equity for 5-10 years.
- (ii) While expenses for actively managing the equity fund hovers around 2.25-2.5%, ETF expenses hovers around 0.3-0.5%. In some cases, it may be as low as 0.05%.
- (iii) There is no need of stock selection and fund manager to track the performance of the funds.

By owning an exchange traded funds, investors get the diversification of an index fund plus the flexibility of a stock. Because Exchange Traded Funds trade like stocks, one can short sell them, buy them on margin and purchase as little as one share. Another advantage is that the expense ratios of most Exchange Traded Funds are lower than that of the average mutual fund. When buying and selling Exchange Traded Funds investors pay their broker the same commission that they would pay on any regular trade.

A great reason to consider Exchange Traded Funds is that they simplify index and sector investing in a way that is easy to understand. If investors feel a turnaround is around the corner, they can go long. If, however, they think ominous clouds will be over the market for some time, they have the option of going short. The combination of the instant diversification, low cost and the flexibility that Exchange Traded Funds offer makes these instruments one of the most useful innovations and attractive pieces of financial engineering to date.

They first came into existence in the USA in 1993. It took several years to generate public interest. But once they did, the volumes took off with a vengeance.

ETFs can be bought/sold through trading terminals anywhere across the country. A comparative view of ETFs vis-à-vis other funds have been depicted as below:

ETFs vs. Open Ended Funds vs. Close Ended Funds

<i>Parameter</i>	<i>Open Ended Fund</i>	<i>Closed Ended Fund</i>	<i>Exchange Traded</i>
Fund Size	Flexible	Fixed	Flexible
NAV	Daily	Daily	Real Time
Liquidity Provider	Fund itself	Stock Market	Stock Market/Fund itself
Sale Price	At NAV plus load, if any	Significant Premium/Discount to NAV	Very close to actual New Scheme
Availability	Fund itself	Through Exchange where listed	Through Exchange with Fund itself.
Portfolio Disclosure	Monthly	Monthly	Daily/Real-time
Uses	Equitising cash		Equitising Cash, hedging, Arbitrage
Intra-Day Trading	Not possible	Expensive	Possible at low cost.

(Source: www.nseindia.com)

10

Money Market Operations

Learning Objectives

After going through the chapter student shall be able to understand

- **Conceptual Framework including the distinct features of Money Market, distinction between Capital and Money market etc.**
- **Institutions**
 - (i) Reserve Bank of India (RBI)
 - (ii) Schedule Commercial Banks (SCBs)
 - (iii) Co-operative Banks
 - (iv) Financial and Investment Institutions
 - (v) Corporates
 - (vi) Mutual Funds
 - (vii) Discount and Finance House of India
- **Instruments**
 - (a) Call/Notice money
 - (b) Inter-Bank Term money
 - (c) Inter-bank Participation Certificate (IBPC)
 - (d) Inter Corporate Deposit
 - (e) Treasury Bills (TBs)
 - (f) Commercial Bills
 - (g) Certificate of Deposits (CDs)
 - (h) Commercial Paper
- **Determination of Interest Rates**
- **Future Possibilities**
- **Recent Development in Money Market**
 - (i) Debt Securitisation
 - (ii) Money Market Mutual Funds (MMMFs)
 - (iii) Repurchase Options (Repo.), Reverse Repurchase Agreement (Reverse Repo) and Ready Forward (RF) contracts

1. Introduction

The financial system of any country is a conglomeration of sub-market, viz. money, capital and forex markets. The flow of funds in these markets is multi-directional depending upon liquidity, risk profile, yield pattern, interest rate differential or arbitrage opportunities, regulatory restrictions, etc. The role of money market in the overall financial system is prime in as much as the market acts as a mechanism for ironing out short term surpluses and deficits and provides a focal point for Central Bank's intervention to bring out variations in liquidity profile in the economy. Money Market is the market for short-term funds, generally ranging from overnight to a year. It helps in meeting the short-term and very short-term requirements of banks, financial institutions, firms, companies and also the Government. On the other hand, the surplus funds for short periods, with the individuals and other savers, are mobilised through the market and made available to the aforesaid entities for utilisation by them. Thus, the money market provides a mechanism for ironing out short-term liquidity imbalances within an economy. Hence, the presence of an active and vibrant money market is an essential pre-requisite for growth and development of an economy.

As the Indian economy gets integrated with the global economy, the demand for borrowing and lending options for the corporates and the financial institutions increases everyday. The major players in the money market are the Reserve Bank of India and financial institutions like the UTI, GIC, and LIC.

While the call money rates have been deregulated and left to the demand and supply forces of the market, the RBI intervenes in the repos through its subsidiaries. The RBI also acts in the foreign exchange market, where it sells US dollars to stabilise the rupee-dollar exchange rate.

1.1 Discussion Points: In context of Money Market we shall attempt to answer following questions in this chapter and elsewhere in this Book.

- What is money market?
- Who are the participants?
- What are the instruments used?
- How are the interest rates determined?
- What is call money?
- What is meant by the term *repos*?
- What are the money market mutual funds (MMMFs)?

1.2 Conceptual Framework: The money market is a market for short-term financial assets which can be turned over quickly at low cost. It provides an avenue for equilibrating the short-term surplus funds of lenders and the requirements of borrowers. It, thus, provides a reasonable access to the users of short term money to meet their requirements at realistic prices. Short term financial asset in this context may be construed as any financial asset which can be quickly converted into money with minimum transaction cost within a period of one year and are termed as close substitute for money or near money.

The money market thus may be defined as a centre in which financial institutions congregate for the purpose of dealing impersonally in monetary assets. In a wider spectrum, a money market can be defined as a market for short-term money and financial assets that are near substitutes for money. The term short-term means generally a period upto one year and near substitutes to money is used to denote any financial asset which can be quickly converted into money with minimum transaction cost.

This is a market for borrowing and lending *short-term* funds. Banks, financial institutions, investment institutions, and corporates attempt to manage the mismatch between inflow and outflow of funds by lending in or borrowing from the money market.

1.3 The Distinct Features of Money Market

- (i) It is one market but collection of markets, such as, call money, notice money, repo's, term money, treasury bills, commercial bills, certificate of deposits, commercial papers, inter-bank participation certificates, inter-corporate deposits, swaps, futures, options, etc. and is concerned to deal in particular type of assets, the chief characteristic is its relative liquidity. All the sub-markets have close inter-relationship and free movement of funds from one sub-market to another. There has to be a network of large number of participants which will add greater depth to the market.
- (ii) The activities in the money market tend to concentrate in some center which serves as a region or an area; the width of such area may vary considerably in some markets like London and New York which have become world financial centres. Where more than one market exists in a country, with screen-based trading and revolutions in information technology, such markets have rapidly becoming integrated into a national market. In India, Mumbai is emerging as a national market for money market instruments.
- (iii) The relationship that characterises a money market should be impersonal in character so that competition will be relatively pure.
- (iv) In a true money market, price differentials for assets of similar type (counterparty, maturity and liquidity) will tend to be eliminated by the interplay of demand and supply. Even for similar types of assets, some differential will no doubt continue to exist at any given point of time which gives scope for arbitrage.
- (v) Due to greater flexibility in the regulatory framework, there are constant endeavours for introducing new instruments/innovative dealing techniques; and
- (vi) It is a wholesale market and the volume of funds or financial assets traded in the market are very large.
- (vii) The Indian money market has a dichotomic structure. It has a simultaneous existence of both the organized money market as well as unorganised money markets. The organised money market consists of RBI, all scheduled commercial banks and other recognised financial institutions. However, the unorganised part of the money market comprises domestic money lenders, indigenous bankers, traders, etc. The organised money market is in full control of the RBI. However, unorganised money market remains outside the RBI control.

10.4 Strategic Financial Management

- (viii) The demand for money in Indian money market is of a seasonal nature. India being an agriculture predominant economy, the demand for money is generated from the agricultural operations. During the busy season i.e. between October and April more agricultural activities takes place leading to a higher demand for money.
- (ix) In the Indian money market, the organized bill market is not prevalent. Though the RBI tried to introduce the Bill Market Scheme (1952) and then New Bill Market Scheme in 1970, still there is no properly organized bill market in India.
- (x) In our money market the supply of various instruments such as the Treasury Bills, Commercial Bills, Certificate of Deposits, Commercial Papers, etc. is very limited. In order to meet the varied requirements of borrowers and lenders, It is necessary to develop numerous instruments.

1.4 Pre-Conditions for an Efficient Money Market: A well developed money market has following characteristics–

- (a) uses a broad range of financial instruments (treasury bills, bills of exchange etc).
- (b) channelises savings into productive investments (like working capital),
- (c) promote financial mobility in the form of inter sectoral flows of funds and
- (d) facilitate the implementation of monetary policy by way of open market operations.

However, the development of money market into a sophisticated market depends upon certain critical conditions. They are:

- (i) Institutional development, relative political stability and a reasonably well-developed banking and financial system.
- (ii) Unlike capital market or commodity markets, tradings in money market are concluded over telephone followed by written confirmation from the contracting parties. Hence, integrity is sine qua non. Thus banks and other players in the market may have to be licensed and effectively supervised by regulators.
- (iii) The market should be able to provide an investment outlet for any temporary surplus funds that may be available. Thus, there must be supply of temporarily idle cash that is seeking short-term investment in an earning asset. There must also exist a demand for temporarily available cash either by banks or financial institutions for the purpose of adjusting their liquidity position and finance the carrying of the relevant assets in their balance sheets.
- (iv) Efficient payment systems for clearing and settlement of transactions. The introduction of Electronic Funds Transfer (EFT), Depository System, Delivery versus Payment (DVP), High Value Inter-bank Payment System, etc. are essential pre-requisites for ensuring a risk free and transparent payment and settlement system.
- (v) Government/Central Bank intervention to moderate liquidity profile.
- (vi) Strong Central Bank to ensure credibility in the system and to supervise the players in the market.

- (vii) The market should have varied instruments with distinctive maturity and risk profiles to meet the varied appetite of the players in the market. Multiple instruments add strength and depth to the market; and
- (viii) Market should be integrated with the rest of the markets in the financial system to ensure perfect equilibrium. The funds should move from one segment of the market to another for exploiting the advantages of arbitrage opportunities.
- (ix) In India, as many banks keep large funds for liquidity purpose, the use of the commercial bills is very limited. RBI should encourage banks to make use of commercial papers instead of making transactions in cash.

The money market in India has been undergoing rapid transformation in the recent years in the wake of deregulation process initiated by Government of India/Reserve Bank of India. The institutions of Primary Dealers (PDs) and Satellite Dealers have been set up as specialised institutions to facilitate active secondary market for money market instruments. New money market instruments have been introduced and more institutions have been permitted as players in the market. Interest rates in respect of all money market instruments have been completely freed and are allowed to be fixed in terms of market forces of demand and supply.

1.5 Rigidities in the Indian Money Market: Notwithstanding the deregulation process initiated by the Reserve Bank of India and several innovations, the money market is not free from certain rigidities which are hampering the growth of the market. The most important rigidities in the Indian money market are:

(i) Markets are not integrated

Money market in India is not well integrated. There is a well-developed secondary capital market in India, which does not exist in money market.

(ii) Players restricted

Only Government, banks, FII and big companies are involved in the money market. Retail investors are rarely interested in the money market making it restricted to only corporates, the Government and the foreign Institutional Investors (FIIs).

(iii) Supply based-sources influence uses

Banks are generally the main sources of fund in the money market. Commercial Banks are main supplier of funds in Money Market Instruments especially RBI which issues Treasury Bills on behalf of the Government of India.

(iv) Not many instruments

Unlike European Market, only few money market instruments are available in India i.e. Treasury bill, commercial papers, commercial bill, certificate of deposit and call/notice money in India.

(v) Reserve requirements

There are fixed reserve requirements in case of Cash Reserve Ratio (CRR) and Statutory Liquidity Ratio (SLR) which banks have to maintain at all times. CRR is the

10.6 Strategic Financial Management

reserve which banks have to keep with RBI. Whereas, SLR is the reserve which banks have to keep with themselves, thus, restricting the flow of money market instruments.

(vi) Lack of transparency

There is lack of transparency in money market because the secondary market is not very well developed. Since, the transactions are done Over the Counter (OTC), there is lack of transparency and public information.

(vii) Commercial transactions are mainly in cash

Since most of the transactions are done through cash, the circulation of funds in money market instrument is restricted.

(viii) Heavy Stamp duty limiting use of exchange bills

In case of issuance of commercial bills, stamp duty is paid in case of bill of exchange, thus, limiting their use. Further, in case of Commercial Paper (CP), the stamp duty rates applicable to non-bank entities are five times higher than those applicable to banks. Moreover, a CP attracts a stamp duty for 90 days irrespective of the tenure. Hence, CP issued for a shorter period attracts higher stamp duty, making it an expensive financial instrument.

1.6 Distinction between Capital and Money Market: There is, however, basically a difference between the money market and capital market. The operations in money market are for a duration upto one year and deals in short term financial assets whereas in capital market operations are for a longer period beyond one year and therefore, deals in medium and long term financial assets. Secondly, the money market is not a well defined place like the capital market where business is done at a defined place viz. stock exchanges. The transactions in the money market are done through electronic media and other written documents. The major points of distinction are enumerated as follows.

- (1) In the Capital Market, there is classification between Primary Market and Secondary Market. While there is no such sub-division in money market, as such. However, slowly a secondary market in greater form is coming up in Money Market also.
- (2) Capital Market deals for fund of long term requirement. In contrast, the Money Market generally supply fund for short term requirement.
- (3) If the volume of business of Capital Market is considered (both Primary and Secondary Markets), it will lag behind the total value of transaction in Money Market.
- (4) While the number of instruments dealt with in the Money Market are many like
 - (a) Interbank Call Money,
 - (b) Notice Money upto 14 days
 - (c) Short-term deposits upto 3 months
 - (d) 91-days Treasury Bill
 - (e) 182-days Treasury Bill

(f) Commercial Paper etc.

The number of instruments in Capital Market are limited i.e. Shares and Debentures.

- (5) The players in Capital Market are general investors, brokers, Merchant Bankers, Registrar to the issue, underwriters, Corporate Investors, Foreign Financial Institutions (FII) and Bankers. While in money market the participants are Bankers, RBI and Government.
- (6) Rate of interest in money market is controlled by RBI or central bank of any country. But capital market's interest and dividend rate depends on demand and supply of securities and stock market's sensex conditions. The regulation of stock market is in the hands of SEBI.
- (7) The degree of risk is small in money market. The risk is much greater in capital market. The maturity of one year or less gives little time for a default to occur, so the risk is minimised. Risk varies both in degree and nature throughout the capital market.
- (8) The money market is closely and directly linked with central bank of the country. The capital market feels central bank's influence, but mainly indirectly and through the money market.

Distinction between Money Market and Capital Market

Basis	Money Market	Capital Market
1. Maturity of Instruments	1 year or less	More than 1 year
2. Risks	Less	More and varied
3. Instruments	Treasury bills, CDs, etc	Shares, bonds, etc
4. Finance	Short term	Long term
5. Relation with Central Bank	Direct	Indirect

1.7 The Participants: The money market in India, as many other less developed countries, is characterised by two segments -

1. Organised Segment
2. Unorganised Segment

The principal intermediaries in the organised segment are:

- (a) The commercial and other banks,
- (b) Non-banking finance companies and
- (c) Co-operative societies.

The primary activity of these intermediaries is to accept deposits from the public and lend them on a short-term basis to industrial and trading organisations. In recent years, they have extended their activities to rural areas to support agricultural operations. There is also an active inter-bank loan market as part of the organised money market.

10.8 Strategic Financial Management

The salient features of the organised money market in India are:

- (i) A significant part of its operations which is dominated by commercial banks, is subject to tight control by the Reserve Bank of India which -
 - (a) regulates the interest rate structure (on deposits as well as loans), reserve requirements and sectoral allocation of credit and
 - (b) provides support to the banks by lending them on a short-term basis and insuring the deposits made by the public.
- (ii) It is characterised by fairly rigid and complex rules which may prevent it from meeting the needs of some borrowers even though funds may be available
- (iii) Overall, there is a paucity of loanable funds, mainly because of the low rate of interest paid on deposits.

The principal participants in the unorganised money market are

- (a) Money Lenders,
- (b) Indigeneous Bankers,
- (c) Nidhis (mutual loan associations) and
- (d) Chit Funds.

They lend, primarily to borrowers who are not able to get credit from the organised money market. The characteristics of the unorganised money market are:

- (i) informal procedures,
- (ii) flexible terms,
- (iii) attractive rates of interest to depositors and
- (iv) high rates of interest to borrowers.

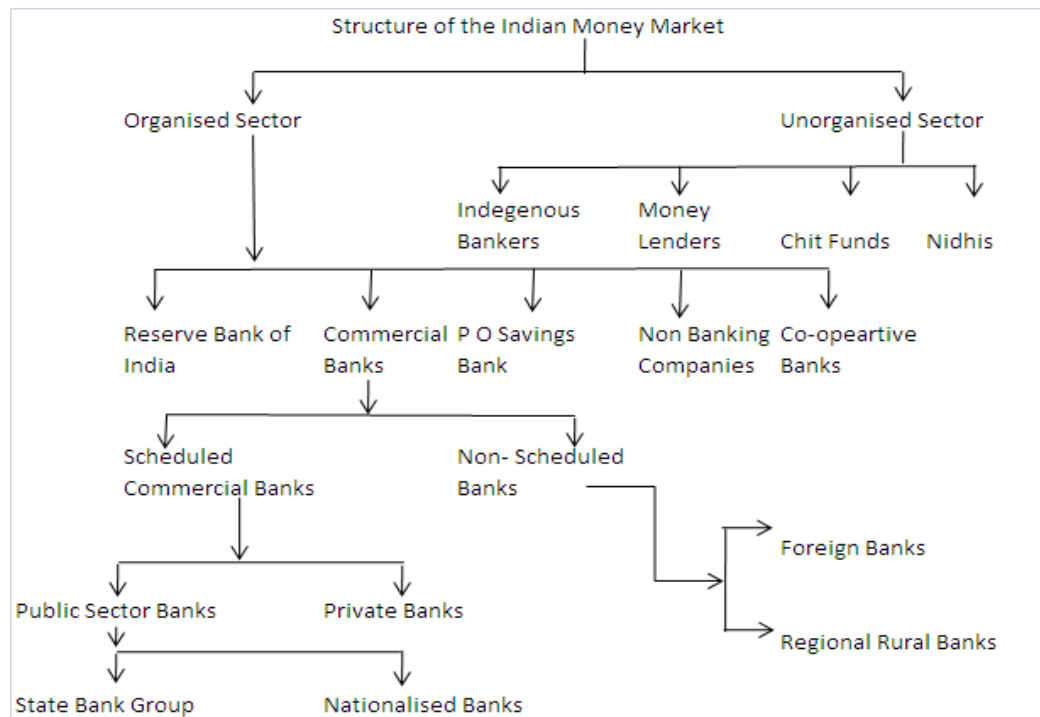
The size of the unorganised money market is difficult to estimate, though it appears to be fairly large. However, its importance relative to that of the organised money market is declining. This is a welcome development from the point of view of the Reserve Bank of India because of the existence of a large unorganised market frustrates its efforts to control credit.

Access to call money market was restricted to scheduled commercial banks until 1971 when the RBI permitted the Unit Trust of India (UTI) and the Life Insurance Corporation of India (LIC) to deploy their short-term funds. The list was later expanded to include cooperative banks, term-lending financial institutions (such as IDBI, IFCI, ICICI and SCICI), MFs launched by the public sector banks and investment institutions, and the MFs set up in private sector. The RBI allowed the MMMFs set up in the public and private sectors to participate in the money market. Former finance minister agreed in principle to allow the Department of Posts to invest its short-term funds in the call money market.

While banks and the UTI can lend as well as borrow, financial institutions, General Insurance Corporation (GIC), LIC, MFs, and MMMs can only lend in the call money market. The private sector banks and MFs have been demanding a level playing field vis-a-vis the UTI regarding

the facility to borrow from the money market so as to meet their redemption requirements. This facility comes in handy for them, particularly in a declining market, as they can obtain the required short-term funds at a lower cost. This is because of the large difference between the cost of the short-term funds in the organised money market and that in the unorganised, or informal, money market. The participation of LIC, GIC and UTI would increase the availability of short-term funds and enable UTI to meet any large repurchases from unit-holders. MFs have now been permitted to borrow from the money market to meet their dividend, interest and redemption obligations. They can borrow upto 20 per cent of their net assets owned.

MMMFs provide an ideal vehicle for an average investor to reap the benefits of high call money rates and high yields on money market instruments which, hitherto, have been enjoyed only by banks and financial institutions while paying a lower rate of interest on deposits. This is because retail investors can't invest in money market instruments due to the restrictions in terms of eligibility and the minimum amount of investment despite higher return offered by these securities. Although, recently, even retail investors have been allowed to subscribe Govt. Securities.



2. Institutions

The important institutions operating in money market are:

(i) **Reserve Bank of India (RBI):** RBI is the most important participant of money market which takes requisite measures to implement monetary policy of the country. As the Central bank, RBI regulates the money market in India and injects liquidity in the banking system, when it is deficient or contracts the same in opposite situation.

10.10 Strategic Financial Management

(ii) **Scheduled Commercial Banks (SCBs):** SCBs form the nucleus of money market. They are the most important borrower/supplier of short term funds. They mobilise the savings of the people through acceptance of deposits and lend it to business houses for their short-term working capital requirements. While a portion of these deposits is invested in medium and long-term Government securities and corporate shares and bonds, they provide short-term funds to the Government by investing in the Treasury Bills.

(iii) **Co-operative Banks:** Function similarly as the commercial banks.

(iv) **Financial and Investment Institutions:** These institutions (e.g. LIC, UTI, GIC, Development Banks etc.) have been allowed to participate in the call money market as lenders only.

(v) **Corporates:** Companies create demand for funds from the banking system. They raise short-term funds directly from the money market by issuing commercial paper. Moreover, they accept public deposits and also indulge in inter-corporate deposits and investments.

(vi) **Mutual Funds:** Mutual funds also invest their surplus funds in various money market instruments for short periods. They are also permitted to participate in the Call Money Market. Money Market Mutual Funds have been set up specifically for the purpose of mobilisation of short-term funds for investment in money market instruments.

(vii) **Discount and Finance House of India:** The Discount and Finance House of India Limited (DFHI) has been set up by the Reserve Bank of India jointly with public sector banks and all-India financial institutions to deal in short-term money market instruments. It started operations in April, 1988. At present DFHI participates in the inter-bank call/notice money market and term deposit market, both as lender and borrower. It also rediscounts 182 Days Treasury Bills, commercial bills, CDs and CPs.

3. Instruments

The money market in India is an important source of finance to industry, trade, commerce and the government sector for both national and international trade through bills-treasury/commercial, commercial papers and other financial instruments and provides an opportunity to the banks to deploy their surplus funds so as to reduce their cost of liquidity. The money market also provides leverage to the Reserve Bank of India to effectively implement and monitor its monetary policy.

The instruments of money market are characterised by

- (a) short duration,
- (b) large volume
- (c) de-regulated interest rates.
- (d) The instruments are highly liquid.
- (e) They are safe investments owing to issuers inherent financial strength.

The traditional short-term money market instruments consist of mainly call money and notice money with limited players, treasury bills and commercial bills. The new money market

instruments were introduced giving a wider choice to short term holders of money to reap yield on funds even for a day or two to earn a little more by parking funds through instruments for a few days more or until such time till they need it for lending at a higher rate. The various features of individual instruments of money market are discussed in the following paragraphs:

The instruments used by above-mentioned players to borrow or lend in the money market, include, *inter-alia*, treasury bills (T-bills), Government of India securities (GOI secs), State government securities, government guaranteed bonds, public sector undertaking (PSU) bonds, commercial paper (CP) and certificates of deposit (CDs). Banks, which require short-term funds, borrow or sell these securities and those having surplus funds would lend or buy the securities. Banks experiencing a temporary rise (fall) in their deposits and hence, a temporary rise (fall) in their statutory liquidity ratio (SLR) obligations, can borrow (lend) SLR securities from those experiencing a temporary fall (rise) in their deposits. Banks invest in T-bills, GOI and State government securities, government-guaranteed bonds and PSU bonds to fulfill their SLR obligations.

3.1 Call/Notice money: Call money market, or inter-bank call money market, is a segment of the money market where scheduled commercial banks lend or borrow on call (i.e., overnight) or at short notice (i.e., for periods upto 14 days) to manage the day-to-day surpluses and deficits in their cash-flows.

However, under notice money market, funds are transacted for a period between two days and fourteen days. These day to day surpluses and deficits arise due to the very nature of their operations and the peculiar nature of the portfolios of their assets and liabilities.

1. **Location:** The core of the Indian money market structure is the inter-bank call money market which is centralised primarily in Mumbai, but with sub-markets in Delhi, Kolkata, Chennai and Ahmedabad.

2. **Duration:** The activities in the call money are confined generally to inter-bank business, predominantly on an overnight basis, although a small amount of business, known as notice money was also transacted side by side with call money with a maximum period of 14 days.

3. **Participants:**

- a. Those who can both borrow as well as lend in the market are RBI, Commercial Banks, Co-operative banks and Primary Dealers.
- b. Non-bank institutions (other than PDs) are not permitted in the call/notice money market.

4. **Features:**

- a. Current and expected interest rates on call money are the basic rates to which other money markets and to some extent the Government securities market are anchored.
- b. Interest rate in the market is market driven and is highly sensitive to the forces of demand and supply. Within one fortnight, rates are known to have moved very high and may even touch level as low as 0.50% to 1%. Intra-day variations are also quite large. Hence, the participants in the markets are exposed to a high degree of interest rate risk.

10.12 Strategic Financial Management

The call money rates have been fluctuating widely going upto 70 per cent and dropping to around 3 per cent in the recent past.

For many years, while a set of institutions like State Bank of India, UTI, LIC, GIC, etc. continue to be lenders, some banks which have limited branch network are regular borrowers.

- c. Although by no means as pronounced as it was once, the activities in the money market are subjected to fluctuations due to seasonal factors, i.e. busy (November to April) and slack (May to October) seasons.
- d. One of the most important factors contributing to volatility in the market is mismatches in assets and liabilities created by the banks. Some banks over-extended themselves by using call money borrowings to finance the build-up of a large portfolio of Government of India securities, other long-term assets and non-food credit. It is this asset-liability mismatch which resulted in a sporadic volatility in the market.
- e. Apart from the mismatches in assets and liabilities, the inherent weakness of the bank of reasonably forecast their liquidity position had often pushed some of them to the pool of liquidity overhang or severe liquidity crunch.
- f. Large-scale diversion of working capital facilities for lending in the inter-corporate deposit market and investments in other treasury products by blue-chip companies amply testify the malady in the current system of working capital financing and its impact on the call money market. The uneasy calm in the money market is attributed to the corporates hunting for cheaper funds in the Euro Dollar and Indian money markets.

3.2 Treasury Bills (TBs): Among money market instruments TBs provide a temporary outlet for short-term surplus as also provide financial instruments of varying short-term maturities to facilitate a dynamic asset-liabilities management. The interest received on them is the discount which is the difference between the price at which they are issued and their redemption value. They have assured yield and negligible risk of default. The TBs are short-term promissory notes issued by Government of India at a discount.

More relevant to the money market is the introduction of 14 days, 28 days, 91 days and 364 days TBs on auction basis. In order to provide investors with instruments of varying short-term maturities, Government of India introduced the auction of 14 days TBs since June 1997. Further, with a view to developing TBs market and moving towards market rate of interest on Government securities, the auction of 91 days TBs was first introduced in January, 1993. The amount to be auctioned will be pre-announced and cut off rate of discount and the corresponding issue price will be determined in each auction. The amount and rate of discount is determined on the basis of the bids at the auctions. While the uniform price auction method is followed in respect of 91 days TBs, the cut off yield of other TBs are determined on the basis of discriminatory price auctions. The non-competitive bids in respect of 14 and 364 days TBs are accepted outside the notified amount. The discretion to accept non-competitive bids fully or partially rest with RBI. The amount to be accepted at the auctions and the cut-off price are decided by the Reserve Bank of India on the basis of its public debt management policy, the conditions in money market and the monetary policy stance.

Although State Government also issued treasury bills until 1950, since then it is only the Central Government that has been selling them. In terms of liquidity, for short term financing, the descending order is cash, call loans, treasury bills and commercial bills. Although the degree of liquidity of treasury bills are greater than trade bills, they are not self liquidating as the genuine trade bills are. T-bills are claim against the government and do not require any grading or further endorsement or acceptance.

Following the abolition of 91 days Tap TBs, 14 days Intermediate TBs was introduced with effect from 1st April, 1997. The 14 days TBs are available on tap. State Governments, foreign, Central Banks and other specialised bodies with whom RBI has an agreement are only allowed to invest in this TBs.

However, at present, the RBI issues Treasury Bills of three maturities i.e. 91 days, 182 days and 364 days.

TBs are issued at discount and their yields can be calculated with the help of the following formula:

$$Y = \left[\frac{F - P}{P} \right] \times \frac{365}{M} \times 100$$

where Y = Yield,
 F = Face Value,
 P = Issue Price/Purchase Price,
 M = Maturity.

3.2.1 Features of T-bills: Some of the prime feature of T-bills are as follows:

- (i) **Form:** The treasury bills are issued in the form of promissory note in physical form or by credit to Subsidiary General Ledger (SGL) account or Gilt account in dematerialised form.
- (ii) **Eligibility:** TBs can be purchased by any person, firm, company corporate body and institutions. State Government, Non-Government Provident Funds governed by the PF Act, 1925 and Employees Provident Fund and Miscellaneous Provisions Act, 1952 are eligible to participate in the auctions of 14 days and 91 days TBs on a non-competitive basis. Non-competitive bids are accepted at the weighted average price arrived at on the basis of competitive bids accepted at the auctions. TBs are approved securities for the purpose of SLR. While Reserve Bank of India does not participate in the auctions of 14 days and 364 days TBs, it will be at its liberty to participate in the auctions and to buy part or the whole of the amount notified in respect of 91 days TBs.
- (iii) **Minimum Amount of Bids:** TBs are issued in lots of ₹ 25,000.
- (iv) **Repayment:** The treasury bills are repaid at par on the expiry of their tenor at the office of the Reserve Bank of India, Mumbai.
- (v) **Availability:** All the treasury Bills are highly liquid instruments available both in the primary and secondary market.
- (vi) **Day Count:** For treasury bills the day count is taken as 364 days for a year.

10.14 Strategic Financial Management

3.2.2 Additional Features: T- Bills have the following additional features:

- (1) Government's contribution to the money market,
- (2) Mop-up short-term funds in the money market,
- (3) Sold through auctions,
- (4) Discount rate is market driven, and
- (5) Focal Point for monetary policy
- (6) Helps to meet the temporary mismatches in cash flows

3.2.3 Advantages to Investors: Following are main advantages of T-bills

- (i) Manage cash position with minimum balances,
- (ii) Increased liquidity,
- (iii) Absence of risk of default
- (iv) Market related assured yield,
- (v) Eligible for repos,
- (vi) SLR security,
- (vii) No capital loss,
- (viii) Two-way quotes by DFHI/Primary Dealers (PDs)/Banks.
- (ix) Low transaction cost
- (x) No tax deducted at source
- (xi) Transparency
- (xii) Simplified Settlement
- (xiii) High degree of tradability and active secondary market facilitates meeting unplanned fund requirements.

The PDs have assumed the role of market makers in treasury bills and they regularly provide two-way quotes. This has added to the liquidity and deepened the secondary market of this instrument. Thus, treasury bills have emerged as an effective instrument for dynamic asset-liability management. Apart from liquidating the treasury bills in the secondary market, treasury bills can be used for transactions which will help the fund managers to temporarily deploy or borrow funds without altering their assets portfolio. Due to its mode and periodicity of issue (weekly and fortnightly auctions) as also the existence of a well developed secondary market, the fund manager could build-up a portfolio of treasury bills with varying maturities which will match their volatile liabilities.

3.3 Commercial Bills: A commercial bill is one which arises out of a genuine trade transaction, i.e. credit transaction. As soon as goods are sold on credit, the seller draws a bill on the buyer for the amount due. The buyer accepts it immediately agreeing to pay amount mentioned therein after a certain specified date. Thus, a bill of exchange contains a written

order from the creditor to the debtor, to pay a certain sum, to a certain person, after a creation period. A bill of exchange is a 'self-liquidating' paper and negotiable; it is drawn always for a short period ranging between 3 months and 6 months.

Bill financing is the core component of meeting working capital needs of corporates in developed countries. Such a mode of financing facilitates an efficient payment system. The commercial bill is instrument drawn by a seller of goods on a buyer of goods. RBI has pioneered its efforts in developing bill culture in India, keeping in mind the distinct advantages of commercial bills, like, self-liquidating in nature, recourse to two parties, knowing exact date transactions, transparency of transactions etc. The RBI introduced Bills Market Scheme (BMS) in 1952 and the Scheme was later modified into New Bills Market Scheme (NBMS) in 1970 on the recommendation of Narasimham Committee. Under the Scheme, commercial banks can discount with approved institutions (i.e. Commercial Banks, Insurance Companies, Development Financial Institutions, Mutual Funds, Primary Dealers, etc.) the bills which were originally discounted by them provided that the bills should have arisen out of genuine commercial trade transactions. The need for physical transfer of bills has been waived and the rediscounting institution can raise Derivative Usance promissory Notes (DUPNs). These DUPNs are sold to investors in convenient lots and maturities on the basis of genuine trade bills, discounted by the discounting bank. The discounting bank should, *inter alia* comply with the following conditions:

- (i) Bank which originally discounts the bills only draw DUPN.
- (ii) Continue to hold unencumbered usance bills till the date of maturity of DUPN.
- (iii) Matured bills should be substituted by fresh eligible bills.
- (iv) The transactions underlying the DUPN should be *bona fide* commercial or trade transactions.

The interest rate on re-discounting of bills was deregulated in May, 1989. Notwithstanding various benefits accruing to this mode of financing, bill financing is yet to develop on a scale commensurate with the credit provided by the banks to the commercial sector. The volume of bills finance to total finance is still an insignificant portion. The DUPNs, like commercial bills, are exempted from stamp duty.

3.3.1 Example: If a bank re-discounted a commercial bill with a face value of ₹ 100/- @ 15% for 2 months will fetch ₹ 97.50, on the basis of the following calculation.

$$\text{Discount} = 100 \times \frac{15}{100} \times \frac{2}{12} = ₹ 2.50$$

However, as the discount amount is paid at front-end.

Example: The yield to the investor or cost to the borrower will be higher than the discount rate in view of the fact that the discounter can deploy the amount of discount received for earning further income. This can be calculated with the following formula:

$$Y = \frac{FV - SV}{SV} \times \frac{\text{Days or months in a year}}{M} \times 100$$

10.16 Strategic Financial Management

where

Y = Yield

FV = Face Value

SV = Sale Value

M = Period of Discount

Accordingly the Yield as per the data given in the example will be:

$$\frac{100-97.50}{97.50} \times \frac{12}{2} \times 100 = 15.385\%$$

3.3.2 Advantages of a developed bill market: A developed bill market is useful to the borrowers, creditors and to financial and monetary system as a whole. The bill market scheme will go a long way to develop the bill market in the country. The following are various advantages of developed bill markets.

- (i) Bill finance is better than cash credit. Bills are self-liquidating and the date of repayment of a bank's loans through discounting or rediscounting is certain.
- (ii) Bills provide greater liquidity to their holders because they can be shifted to others in the market in case of need for cash.
- (iii) A developed bill market is also useful to the banks in case of emergency. In the absence of such a market, the banks in need of cash have to depend either on call money market or on the Reserve Bank's loan window.
- (iv) The commercial bill rate is much higher than the treasury bill rate. Thus, the commercial banks and other financial institutions with short-term surplus funds find in bills an attractive source of both liquidity as well as profit.
- (v) A developed bill market is also useful for the borrowers. The bills are time-bound, can be sold in the market and carry the additional security in the form of acceptor's signature. Therefore, for the borrowers, the cost of bill finance is lower than that of cash credit.
- (vi) A developed bill market makes the monetary system of the country more elastic. Whenever the economy requires more cash, the banks can get the bills rediscounted from the Reserve Bank and thus can increase the money supply.
- (vii) Development of the bill market will also make the monetary control measures, as adopted by the Reserve Bank, more effective.

3.4 Certificate of Deposits (CDs): The CDs are negotiable term-deposits accepted by commercial bank from bulk depositors at market related rates. CDs are usually issued in demat form or as a Usance Promisory Note.

(i) Eligibility: All scheduled banks (except RRBs and Local Area Banks) are eligible to issue CDs. It can also be issued by select all India Financial Institutions. They can be issued to individuals, corporates, trusts, funds and associations. NRIs can also subscribe to CDs but on

non-repatriable basis only. In secondary markets such CDs cannot be endorsed to another NRI.

(ii) Term: The CDs can be issued by scheduled commercial banks (excluding RRBs) at a discount to face value for a period from 7 days to one year.

For CDs issued by Financial institutions maturity is minimum 1 year and maximum 3 years.

(iii) Denomination: The CDs can be issued for minimum amount of ₹ 1 lakhs to a single investor and multiples of ₹ 1 lakh thereafter. There is, however, no limit on the total quantum of funds raised through CDs.

(iv) Transferability: CDs issued in physical form are freely transferable by endorsement and delivery. Procedure of transfer of dematted CDs is similar to any other demat securities. There is no lock in period for the CDs.

(v) Others: The CDs are to be reckoned for reserve requirements and are also subject to stamp duty. Banks are prohibited from granting loans against CDs as buy-back of their own CDs.

(vi) Discount: CDs may be issued at a discount on face value. Banks / FIs are also allowed to issue CDs on floating rate basis provided the methodology of compiling the floating rate is objective, transparent and market-based. The issuing bank / FI is free to determine the discount / coupon rate. The interest rate on floating rate CDs would have to be reset periodically in accordance with a pre-determined formula that indicates the spread over a transparent benchmark. The investor should be clearly informed of the same.

(vii) Reserve Requirements: Banks have to maintain appropriate reserve requirements, i.e., Cash Reserve Ratio (CRR) and Statutory Liquidity Ratio (SLR), on the issue price of the CDs.

Just like Commercial Bills, Certificate of Deposit (CD) is a front-ended negotiable instrument, issued at a discount and the face value is payable at maturity by the issuing bank.

Example:

Amount of Issue – ₹ 100

Period - 6 months

Rate of discount – 20%

$$\text{Discount} = 100 \times \frac{20}{100} \times \frac{6}{12} = ₹ 10.00$$

Hence CD will be issued for ₹ 100 – 10 = ₹ 90.00. The effective rate to the bank will, however, be calculated on the basis of the following formula:

$$E = \frac{FV-SV}{SV} \times \frac{\text{Days or months in a year}}{M} \times 100$$

where

E = Effective Yield

10.18 Strategic Financial Management

FV = Face Value

SV = Sale Value

M = Period of Discount

Accordingly, the Yield as per the data given in the example will be:

$$\frac{100-90}{90} \times \frac{12}{6} \times 100 = 22.226\%$$

In terms of the provisions of CD Scheme, banks were allowed to issue CDs to their customers upto an aggregate amount equivalent to 5 per cent of their aggregate deposit. These instruments are subject to payment of stamp duty like the usance promissory notes. Since a CD is eligible for rediscounting in the money market only after 30 days of holding, the maturity period of CDs available in the market can be anywhere between 1 month to one year. A CD is, therefore, another step in filling the gap between Treasury Bills/Commercial Bills and dated securities. Banks also find this instrument suitable to reward its big size depositors with better rate of return as an incentive.

Despite the large size of the primary market for CDs, there has been virtually no activity in the secondary market and the holders keep the CDs till maturity. So long as there is sluggish growth of deposits at administered low rates vis-a-vis the high rates offered by the non-banking non-financial institutions and others, banks in distress for funds will always need CDs at any cost. They may be useful where the average yield on advances is higher than the effective cost of CDs and the loan assets are largely in Health Code No. 1.

3.5 Commercial Paper: Commercial Paper (CP) has its origin in the financial markets of America and Europe. The concept of CPs was originated in USA in early 19th century when commercial banks monopolised and charged high rate of interest on loans and advances. In India, the CP was introduced in January 1990 on the recommendation of Vaghul Committee subject to various conditions. When the process of financial dis-intermediation started in India in 1990, RBI allowed issue of two instruments, viz., the Commercial Paper (CP) and the Certificate of Deposit (CD) as a part of reform in the financial sector. A notable feature of RBI Credit Policy announced on 16.10.1993 was the liberalisation of terms of issue of CP. At present it provides the cheapest source of funds for corporate sector and has caught the fancy of corporate sector and banks. Its market has picked up considerably in India due to interest rate differentials in the inter-bank and commercial lending rates.

CPs are unsecured and negotiable promissory notes issued by high rated corporate entities to raise short-term funds for meeting working capital requirements directly from the market instead of borrowing from banks. Its period ranges from 7 days to 1 year. CP is issued at discount to face value and is not transferable by endorsement and delivery. The issue of CP seeks to by pass the intermediary role of the banking system through the process of securitisation.

It partly replaces the working capital limits enjoyed by companies with the commercial banks and there will be no net increase in their borrowing by issue of CP.

3.5.1 Role of RBI: As a regulatory body, RBI lays down the policies and guidelines with regard to commercial paper to maintain a control on the operational aspects of the scheme.

- Prior approval of RBI is required before a company can issue CP in the market.
- RBI controls the broad timing of the issue to ensure orderly fund-raising.
- Every issue of CP launched by a company, including roll-over will be treated as fresh issue and the issuing company will be required to seek prior permission from RBI, before each roll-over.

The CPs can be issued by all non-banking (financial as well as non-financial) companies and All-India Financial Institutions. The instrument is instantly advantageous to the issuer and the investor. The issue of CPs does not involve bulky documentation and its flexibility with the opportunities can be tailored to meet the cash flow of the issuer. A highly rated company can raise cheaper funds than from the financing bank while the investor can deploy its short-term surplus at relatively high return. The secondary market for CPs ensures liquidity and the compulsory credit rating imparts inherent strength to the issuer's ability to meet the obligations on maturity. The bank as managers or dealers of the instrument gets fees to supplement their income. Bank can also invest their surplus short-term funds in CP.

3.5.2 Timing of CP: The timing of the launch of the CP issue would be indicated by RBI while giving its permission, to ensure an orderly approach to the market.

3.5.3 Denomination and size of CP

Denomination of CP note	–	₹ 5 lacs or multiples thereof.
Maximum size of CP issue	–	100% of the issuer's working capital (fund based) limits (determined by the consortium leader).

The entire approved quantum of CP can be issued on a single date, or in parts on different dates, within two weeks of the Reserve Bank of India's approval, subject to the condition that the entire amount of issue matures on the same date.

3.5.4 Period of CP

Minimum currency	–	7 days from the date of issue.
Maximum currency	–	One year from the date of issue.

The entire approved amount should be raised within a period of 2 weeks from the date on which issuer opens the issue for subscription.

Each CP issue (including roll-over) has to be treated as a fresh issue has to seek permission from RBI.

3.5.5 Mode of CP

CP has to be issued at a discount to face value.

Discount rate has to be freely determined by the market.

3.5.6 Negotiability of CP: CP (being usance promissory note) would be freely negotiable by endorsement and delivery.

3.5.7 Underwriting/co-acceptance of CPs: The CP issue cannot be underwritten or co-accepted in any manner. Commercial Banks, however, can provide standby facility for redemption of CPs on the maturity date.

3.5.8 Issue expenses: The issue of CP would be subject to payment of stamp duty. All issue expenses such as dealer's fees, issuing and paying agent's fees, rating agency fees, charges levied by banks for providing redemption standby facilities and any other charges connected with the issue of CPs are to be borne by the issuer.

3.5.9 The issuer: The CP issuer can be a Company incorporated under the Companies Act subject to some requirements.

3.5.10 Benefits of Commercial Paper

CPs have been introduced in the Indian market so as to provide a diversified source of funding to the borrowers as well as an additional investment option to the investors. CPs can now be issued as a low cost alternative to bank financing to meet a part of working capital requirements.

(A) Benefits to the Issuer – The following are major benefits to issuer of CP

- (i) **Low interest expenses:** The interest cost associated with the issuance of CP is normally expected to be less than the cost of bank financing, as among other things, it is related to the inter-corporate money market rate, which in normal times is within the cost of bank finance.
- (ii) **Access to short term funding:** CP issuance provides a company with increased access to short term funding sources. By bringing the short term borrower into direct contact with investors, the CP market will, to some extent, disintermediate the established role of banks and pass on the benefit to both issuers and investors.
- (iii) **Flexibility and liquidity:** CP affords the issuer increased flexibility and liquidity in matching the exact amount and maturity of its debt to its current working capital requirement.
- (iv) **Investor recognition:** The issuance of CP provides the issuer with favourable exposure to major institutional investors as well as wider distribution of its debt.
- (v) **Ease and low cost of establishment:** A CP programme can be established with ease at a low cost, once the basic criteria have been satisfied.

(B) Benefits to the Investor – The following are major benefits to investor of CP

- (i) **Higher yield:** Higher yields are expected to be generally obtainable on CP than on other short term money market instruments like bank deposits. Investment managers are increasingly looking to match investible excess cash with higher yielding securities as compared to those presently available in the market.
- (ii) **Portfolio diversification:** Commercial Paper provides an attractive avenue for short term portfolio diversification.

- (iii) **Flexibility:** CPs can be issued for periods ranging from 15 days to less than one year, thereby affording an opportunity to precisely match cash flow requirements.
- (iv) **Liquidity:** Liquidity in CP is generally provided by a dealer offering to buy it back from an investor prior to maturity, for which a market quote will be available. The investment in CP will therefore be quite liquid.

Difference between Commercial Bill and Commercial Paper

Commercial Bill	Commercial Paper
Commercial Bill arises from sale transactions. Banks finance commercial bills. Usually the bills consist of an invoice drawn on the buyer, the documents to title to goods and a bill of exchange. The bills are given to the bank for advancing money against sale of goods. Commercial Bill financing is post sale finance. The Bill of Exchange may be on D/P (document against Payment) or D/A (document against acceptance) terms.	Commercial paper is an unsecured and discounted promissory note issued to finance the short-term credit needs of large institutional buyers. Banks, corporations and foreign governments commonly use this type of funding.

4. Determination of Interest Rates

Call money rates were regulated in the past by the RBI or by a voluntary agreement between the participants through the intermediation of the Indian Banks Association (IBA). The interest rates have been deregulated and left to the market forces of demand for; and supply of, short-term money as part of the financial sector reforms.

The call money market witnessed a turbulence in the recent past when the rates shot up to as high as 130 per cent. The reasons for increase in volatility in the call money market, amongst others, include advance corporate tax payments, investors' interest in primary and secondary capital markets including the units issued by mutual funds, large withdrawals on banks' credit lines, imprudent practices of banks, and developments in the foreign exchange market. Banks were reported to have invested in government securities by borrowing on call to earn the spread when call rates were low.

Issuers, Instruments and Investors in Money Market

Issuer	Instrument	Issuance maturity	Investors
Central Government	GOI secs	2 to 10 years	Banks, LIC, GIC, UTI, FIs, FIIS, MFs, MMMFs, PFs, pension funds, corporates, NBFCs, & RBI
Central Government	T-bills	3 months to 1 year	Banks, UTI, LIC, GIC, PFs, MFs, MMMFs, pension funds, corporates, NBFCs & RBI

10.22 Strategic Financial Management

State Government	State Government Securities	5 to 10 years	Banks, UTI, LIC, GIC, FIs, PFs, MFs, MMMFs, pension funds, corporates & NBFCs.
Government Agencies	Government Guaranteed Bonds	5 to 10 years	Banks, UTI, LIC, GIC, FIs, PFs, MFs, MMMFs, pension funds, corporates & NBFCs.
PSUs	PSU Bonds	5 to 10 years	Banks, UTI, LIC, GIC, FIs, MFs, MMMFs, NBFCs & corporates
Private sector corporates	Corporate Debentures	1 to 12 years	UTI, other MFs, LIC, GIC, FIs, MMMFs & corporates
Public & Private sector Corporates	Commercial paper	15 days to less than one year	Banks, MFs, FIs, MMMFs, & corporates
Banks and FIs	Certificates of deposit	3 months (banks) 1-3 years (FIs)	Banks, FIs, MFs, MMMFs, & corporates

5. Recent Development in Money Market

5.1 Debt Securitisation: The buzzword in the money market is now debt securitisation, which refers to converting retail loans into whole sale loan and their reconverting into retail loans. For example, a bank lends ₹ 10 lakhs each to 300 borrowers as part of its loan portfolio. The total debt thus on the books of the bank will be ₹ 30 crores. By way of securitisation, the bank can break the entire portfolio of loans/debt of ₹ 30 crores into a paper of ₹ 300 each for instance, and market it in the secondary market to investors. The philosophy behind the arrangement is that an individual body cannot go on lending sizable amount for about a longer period continuously but if the loan amount is divided in small pieces and made transferable like negotiable instruments in the secondary market, it becomes easy to finance large projects having long gestation period.

The experiment has already been initiated in India by the Housing Development Finance Corporation (HDFC) by selling a part of its loan to the Infrastructure Leasing and Financial Services Ltd. (ILFS) and has therefore become a pacesetter for other kinds of debt securitisation as well.

The Industrial Credit and Investment Corporation of India (ICICI) as well as other private financial companies have been trying similar deals for lease rentals. Some finance companies are also following the same route for financing promoters contribution for projects. The HDFC has entered into an agreement with ILFS to securitise its individual housing loan portfolio to the extent of ₹ 100 crores.

Debt Securitisation will thus provide liquidity to the instrument. As market maker, ILFS will quote a bid and offer a price for the paper. Given the scarcity of resource and to provide flexibility to investors, innovative financing techniques such as debt securitisation which will mobilise additional resources through a wider investor base, is a step in the right direction.

A major trend in the international financial markets in recent years has been towards securitisation of long dated assets, held by them as security/mortgage against credit to customers.

5.2 Money Market Mutual Funds (MMMFs): One of the recent development in the sphere of money market is the establishment of Money Market Mutual Funds, the guidelines of which have been made public by the Reserve Bank of India. Money Market Mutual Funds (MMMFs) can be set up by the banks and public financial institutions. There can also be Money Market Deposit Accounts (MMDAs).

(i) Limit: The limit for raising resources under the MMMF scheme should not exceed 2% of the sponsoring bank's fortnightly average aggregate deposits. If the limit is less than ₹ 50 crores for any bank, it may join with some other bank and jointly set up MMMF. In the case of public financial institutions, the limit should not exceed 2% of the long term domestic borrowings as indicated in the latest available audited balance sheets.

(ii) Eligibility: MMMFs are primarily intended for individual investors including NRIs who may invest on a non–repatriable basis. MMMFs would be free to determine the minimum size of the investment by a single investor.

(iii) Minimum rate of return: There is no guaranteed minimum rate of return.

(iv) Lock in period: The minimum lock in period would be 46 days.

(v) Deployment of capital: The resources mobilised by MMMFs should be invested exclusively in various money market instruments.

5.3 Repurchase Options (Repo.), Reverse Repurchase Agreement (Reverse Repo) and Ready Forward (RF) Contracts:

The term Repurchase Agreement (Repo) and Reverse Repurchase Agreement (Reverse Repo) refer to a type of transaction in which money market participant raises funds by selling securities and simultaneously agreeing to repurchase the same after a specified time generally at a specified price, which typically includes interest at an agreed upon rate. Sometimes it is also called *Ready Forward Contract* as it involves funding by selling securities (held on Spot i.e. Ready Basis) and repurchasing them on a forward basis.

5.3.1 Difference between Repo and Reverse Repo:

Following are major differences between Repo and Reverse Repo

- (a) Repo rate is the rate at which Reserve Bank of India (RBI) lends to Commercial Banks for a short period of time against Government Securities. On the other hand, Reverse Repo is the rate at which Commercial Banks lend to RBI.
- (b) A transaction is called a Repo when viewed from the perspective of the seller of securities (the party acquiring funds) and Reverse Repo when described from the point of view of the supplier of funds. Thus, whether a given agreement is termed a Repo or a Reverse Repo depends largely on which party initiated the transaction.
- (c) The purpose of Repo is to fulfill the deficiency of funds. While, the purpose of Reverse repo is to make sure that there is liquidity in the economy.

10.24 Strategic Financial Management

- (d) The Repo rate is comparatively high in comparison to Reverse Repo rate.
- (e) The Repo rate strives to contain inflation in the economy. The Reverse repo aims to control money supply in the economy.
- (f) Repo is based on Repurchase Agreement i.e. there will be an agreement between two parties on the condition that one party will sell securities to the other on the promise that it will be bought back by him after a certain period of time. On the other hand, Reverse repo is based on the Reverse Repurchase Agreement which is just the opposite of whatever has been explained above.

5.3.2 Characteristics of Repo

(i) Origin: Repo transactions are of recent origin which has gained tremendous importance due to their short tenure and flexibility to suit both lender and borrower. Under these transactions the borrower places with lender certain acceptable securities against funds received and agrees to reverse this transaction on a pre-determined future date at agreed interest cost.

(ii) Hybrid Instrument: In many respects, Repos are hybrid transactions that combine features of both secured loans and outright purchase and sale transactions but do not fit clearly into their classification.

(iii) Repo rates: The lender or buyer in a Repo is entitled to receive compensation for use of the funds provided to the counterparty. This is accomplished by setting the negotiated repurchase price over the initial sale price, the difference between the two representing the amount of interest or Repo rate owed to the lender. The Repo rate is negotiated by the counterparties independently of the coupon rate or rates of the underlying securities and is influenced by overall money market conditions. In India, Repo rates are determined on the basis of expected call money rates during a reserve mark-up period.

(iv) Period: Repo's are usually arranged with short-term maturity – overnight or a few days. However, the minimum period of Repo in India is fixed at 3 days. Elsewhere in the world, longer-term repo's are arranged for standard maturities between one day and 1 year.

(v) Interest: The interest on such transactions is market determined and built in the structure of the Repo.

(vi) Eligibility: The transactions can be undertaken by commercial banks, financial institutions, brokers, DFHI.

(vii) Hair Cut: The use of margins or haircuts in valuing repo securities, and the use of mark-to-market provisions are examples of Repo features that typically are characteristics of secured lending arrangements but are rarely found in outright purchase and sale transactions.

(viii) Prohibition: At present Repo transactions have been prohibited in all securities except treasury bills. However, Nand Karni panel set up for examining transactions in PSU bonds and UTI units have recognised the importance of this instrument as a money market instrument and recommended its re-introduction.

5.3.3 Role of RBI

The RBI intervenes in the market as and when required by conducting repos (ready forward purchases) through its two subsidiaries, namely, Securities Trading Corporation of India (STCI) and Discount and Finance House of India (DFHI). The central bank banned these transactions between banks following their misuse to divert funds from the banks to the stock market and reintroduced the same in April, 1992. The RBI has permitted repos in dated securities, and reverse repo transactions by non-bank subsidiary general ledger (SGL) account holders in the lean season credit policy announced in April, 1997. Non-bank entities holding SGL accounts can lend their surplus money to banks by entering into a reverse repurchase agreement or reverse repo. These entities entering into a reverse repo with banks purchase (permitted) repo securities from banks with a commitment to sell the same at an agreed future date and price.

When there is a spurt in call rates, the RBI intervenes through STCI/DFHI by conducting these repos to inject the required liquidity. STCI and DFHI are market-makers in dated GOI secs and T-bills. They give a two-way quote for the securities which they make the market for. The bid, or the buying rate, is always lower than the ask, or selling rate, for a given security. The spread between bid and ask (or offer) rate accounts for the transaction cost and normal profit from operations. The RBI intervenes to prevent the diversion of investment funds to the call money market.

For example, Bank A, which is short of cash, can sell its repo securities to Bank B or STCI or DFHI at ₹ 96.25 with a commitment to repurchase them at ₹ 96.75 after 14 days. The difference between the sale price and the repurchase price or the spread represents the interest rate on the borrowed money.

The Repo buyers rights to trade the securities during the term of the agreement, as it represents a transfer of ownership that typically does not occur in collateralised lending arrangements.

The amount of interest earned on funds invested in a Repo determined as follows :

$$\text{Interest earned} = \text{Funds Invested} \times \text{Repo Rate} \times \text{Number of Days}/365$$

For example, if ₹ 1 crore is for 3 days @ 5% would yield interest return of ₹ 0.04 lakhs.

$$1,00,00,000 \times 0.05 \times 3/365 = ₹ 4110$$

Illustration

Bank A enters into a Repo for 14 days with Bank B in 12% GOI Bonds 2017 at a rate of 5.25% for ₹5 Crore. Assuming that the clean price be 99.42, initial margin be 2% and days of accrued interest be 292, you are required to determine:

- (a) Dirty Price
- (b) Start Proceeds (First Leg)
- (c) Repayment at Maturity (Second Leg)

Note: Number of days in a year is 360.

10.26 Strategic Financial Management

Answer

(a) **Dirty Price**

$$\begin{aligned} &= \text{Clean Price} + \text{Interest Accrued} \\ &= 99.42 + 100 \times \frac{12}{100} \times \frac{292}{360} \\ &= 109.1533 \end{aligned}$$

(b) **First Leg (Start Proceed)**

$$\begin{aligned} &= \text{Nominal Value} \times \frac{\text{Dirty Price}}{100} \times \frac{100 - \text{Initial Margin}}{100} \\ &= ₹5,00,00,000 \times \frac{109.1533}{100} \times \frac{100-2}{100} \\ &= ₹5,34,85,117 \text{ say } ₹5,34,85,000 \end{aligned}$$

(c) **Second Leg (Repayment at Maturity)**

$$\begin{aligned} &= \text{Start Proceed} \times \left(1 + \text{Repo rate} \times \frac{\text{No. of days}}{360}\right) \\ &= ₹5,34,85,000 \times \left(1 + 0.0525 \times \frac{14}{360}\right) \\ &= ₹5,35,94,199 \end{aligned}$$

In India, the repo market in Government securities and PSU bonds became very active in 1980s, and the deals were generally interbank. While certain regulatory restrictions were put in place in 1987, in the aftermath of securities scam, RBI imposed a ban on inter-bank repos in 1992 in all instruments except TBs. Since then RBI has made several relaxations in regard to Repo Transactions.

The conditions imposed by RBI in regard to repo transactions are:

- (i) The banks should enter into Repo transactions only in respect of TBs of all maturities, notified Government of India dated securities, and private corporate bonds/PSU bonds which are in dematerialised form and the transactions are done in recognised Stock Exchanges;
- (ii) Repo transactions should be entered only with commercial and co-operative banks and Primary Dealers. However, non-bank entities who are holders of SGL Account with RBI can enter into Reverse Repo transactions with banks/Primary Dealers in TBs, notified Government of India stocks, debentures/PSU bonds;
- (iii) The purchase/sale price should be in alignment with the ongoing market rates;
- (iv) No sale of securities should be affected unless such securities are actually held by them in their own investment portfolio;

- (v) Immediately on sale, the corresponding amount should invariably be deducted from the investment account of the banks;
- (vi) The minimum period of the Repo should be 3 days; and
- (vii) The securities under Repo should be marked to market on the balance sheet date.

DFHI/STCI/PDS are very active in Repo market and the volume of such transactions has shown substantial increase when the call money rates move up beyond a particular level. Of late, RBI has been conducting Repo auctions for 3/4 days to mop-up the excess liquidity released to the system through reduction of CRR/Intervention in the forex market.

Repo transactions are structured to suit the requirements of both the borrowers and the lender of funds and have become extremely popular mode of raising/investing short-term funds. Further, a SLR surplus and CRR deficit bank can use the repo deals as a convenient way of adjusting SLR/CRR positions simultaneously. The Repo is a convenient instrument for Asset-Liability management.

"Non-banking institutions like corporates, mutual funds and financial institutions can go to repo (repurchase) market for meeting their short-term funds or securities requirement".

Of late the Reserve Bank has been making efforts to develop the repo market in the country. Last year, it has initiated a series of measures to popularize and widen the participation in the repo market.

The measures include: permission to non-bank participants to undertake repo and reverse repo transactions, reduction in the minimum maturity for repo transactions to one day and offering even State government securities for undertaking repos.

"What we need is quick settlements in the repo market. The setting up of a clearing corporation will develop repo market very strongly. We expect the clearing corporation to come up before year." The repo (repurchase) market is mainly a buyback arrangement.

Under such an arrangement the seller sells specified securities with an agreement to repurchase the same at a mutually decided future date and a price.

Similarly, the buyer purchases the securities with an agreement to resell the same to the seller on an agreed date in future at a prefixed price.

This is done mainly to bridge the short-term gap of either cash flow or securities (to meet SLR — statutory liquidity ratio — requirements).

FINAL COURSE STUDY MATERIAL

PAPER 2

**STRATEGIC FINANCIAL
MANAGEMENT**

MODULE – 3



**BOARD OF STUDIES
THE INSTITUTE OF CHARTERED ACCOUNTANTS OF INDIA**

This Study Material has been prepared by the faculty of the Board of Studies. The objective of the Study Material is to provide teaching material to the students to enable them to obtain knowledge and skills in the subject. In case students need any clarifications or have any suggestions to make for further improvement of the material contained herein, they may write to the Director of Studies.

All care has been taken to provide interpretations and discussions in a manner useful for the students. However, the Study Material has not been specifically discussed by the Council of the Institute or any of its Committees and the views expressed herein may not be taken to necessarily represent the views of the Council or any of its Committees.

Permission of the Institute is essential for reproduction of any portion of this material.

© THE INSTITUTE OF CHARTERED ACCOUNTANTS OF INDIA

All rights reserved. No part of this book may be reproduced, stored in retrieval system, or transmitted, in any form, or by any means, electronic, mechanical, photocopying, recording, or otherwise, without prior permission in writing from the publisher.

Revised Edition : January, 2015

Website : www.icaai.org

Department/
Committee : Board of Studies

E-mail : bosnoida@icaai.in

ISBN No. :

Price :

Published by : The Publication Department on behalf of The Institute of Chartered Accountants of India, ICAI Bhawan, Post Box No. 7100, Indraprastha Marg, New Delhi-110 002, India.

Typeset and designed at Board of Studies.

Printed by :

CONTENTS

MODULE-1

Chapter 1 – Financial Policy and Corporate Strategy

Chapter 2 – Project Planning and Capital Budgeting

Chapter 3 – Leasing Decisions

Chapter 4 – Dividend Decisions

MODULE-2

Chapter 5 – Indian Capital Market

Chapter 6 – Security Analysis

Chapter 7 - Portfolio Theory

Chapter 8 – Financial Services In India

Chapter 9 – Mutual Funds

Chapter 10 – Money Market Operations

MODULE-3

Chapter 11 – Foreign Direct Investment (FDI), Foreign Institutional Investment (FIIS) and International Financial Management

Chapter 12 – Foreign Exchange Exposure and Risk Management

Chapter 13 – Mergers, Acquisitions & Restructuring

DETAILED CONTENTS: MODULE – 3

CHAPTER 11 – FOREIGN DIRECT INVESTMENT (FDI), FOREIGN INSTITUTIONAL INVESTMENT (FIIs) AND INTERNATIONAL FINANCIAL MANAGEMENT

PART - A

1.	Costs Involved	11.2
2.	Benefits derived	11.2
3.	Foreign Institutional Investment	11.3

PART – B

1.	Introduction	11.5
2.	Instruments of International Finance	11.8
3.	Financial Sector Reforms in India.....	11.8
4.	International Financial Instruments and Indian Companies.....	11.9
5.	Euro-Issues.....	11.19
6.	GDRs Vs. Euro-Bonds	11.23
7.	Cross-Border Leasing	11.23
8.	International Capital Budgeting	11.24
9.	International Working Capital Management	11.36

CHAPTER 12 – FOREIGN EXCHANGE EXPOSURE AND RISK MANAGEMENT

1.	Introduction	12.2
2.	Foreign Exchange Market	12.3
3.	Market participants.....	12.4
4.	Nostro, Vostro and Loro Accounts.....	12.4
5.	Exchange Rate Determination	12.6
6.	Exchange Rate Quotation	12.7
7.	Exchange Rate Forecasting	12.9

8.	Exchange Rate Theories	12.10
9.	Risk Management	12.14
10.	Risk Considerations	12.15
11.	Foreign Exchange Exposure	12.18
12.	Types of Exposures	12.18
13.	Techniques for Managing Exposure	12.19
14.	Strategies for Exposure Management	12.33
15.	Hedging Currency Risk	12.34
16.	Conclusion.....	12.37

CHAPTER 13 – MERGERS, ACQUISITIONS & RESTRUCTURING

1.	Introduction.....	13.1
2.	Reasons and Rationale for Mergers and Acquisitions	13.5
3.	Gains from Mergers or Synergy	13.7
4.	Accounting for Amalgamations.....	13.9
5.	Problems for M & A in India.....	13.10
6.	Mergers in specific sectors.....	13.11
7.	Acquisition and Takeover	13.11
8.	Takeover by Reverse Bid.....	13.12
9.	The Acquisition Process	13.13
10.	Defending a company in a takeover bid	13.17
11.	Legal Aspects of M & As	13.19
12.	Due Diligence	13.19
13.	Target Valuation for M & As	13.20
14.	Case Studies	13.29
15.	Corporate Restructuring.....	13.34
16.	Financial Restructuring	13.38

17.	Marger Failures or Potential Adverse Competitive Effects	13.41
18.	Acquiring for Shares	13.42
19.	Cross-Border M & As	13.46
20.	Decade of Corporate Churning and Change.....	13.46

11

Foreign Direct Investment (FDI), Foreign Institutional Investment (FIIs) and International Financial Management

Learning Objectives

After going through the chapter student shall be able to understand

- Foreign Direct Investment (FDI)
 - Costs Involved- By Host Country and Home Country
 - Benefits Derived- By Host Country and Home Country
- Foreign Institutional Investment
- International Financial Management - Including raising Of capital abroad (ADRs, GDRs, ECB)
- Instruments of International Finance
 - (1) Foreign Currency Convertible Bonds (FCCBs)
 - (2) Global Depository Receipts (GDRs)
 - (3) Euro-Convertible Bonds (ECBs)
 - (4) American Depository Receipts (ADRs)
 - (5) Other sources
- Euro-Issues- Eligibility, Advantages, Disadvantages, Structuring, Pricing and Methodology
- GDRs Vs. Euro-Bonds
- Cross-Border Leasing
- International Capital Budgeting
- International Working Capital Management

Part – A
Foreign Direct Investment (FDI), Foreign Institutional Investment (FIIS)

1. Costs Involved

1.1 For Host Country: Inflow of foreign investment improves balance of payments position while outflow due to imports, dividend payments, technical service fees, royalty reduces balance of payments position. Use of imported raw materials may be harmful to the interest of the domestic country whereas it may be useful to the interests of the foreign country. Supply of technology to the host country makes it dependent on the home country resulting in the payment of higher price for acquisition. The technology may not be suitable to the local environment causing substantial loss to the host country. MNCs are reluctant to hire and train local persons. Advanced technology being capital intensive does not ensure bigger job prospects. Foreign investors do not care to follow pollution standards; nor do they stick to the optimal use of natural resources nor have any concern about location of industries while opting for a manufacturing process. Such violation affects host nations interest. Domestic industries cannot withstand the financial power exercised by the foreign investors and thereby die a pre-mature death. Because of their oligopolistic position in the market, foreign companies charge higher prices for their products. Higher prices dampen the spirit of the buyers and at the same time lead to an inflationary pressure. Foreign culture is infused by these foreign companies in industrial units as well as to the society at large. Governmental decisions fall prey to such measures as they become a dominant force to reckon with.

1.2 For Home Country: Cost involvement for the home country is a paltry sum. Any foreign investment causes a transfer of capital, skilled personnel and managerial talent from the country resulting in the home country's interest being hampered. MNCs have the primary objective of maximising their overall profit while operating in different countries. The standards followed by them in most cases are not beneficial to the host nation. Such an action leads to deterioration in bilateral relations between the host and home country.

FDI is a mixed bag of bright features and dark spots. So it requires careful handling by both sides.

2. Benefits Derived

2.1 For Host Country

(a) Improves balance of payment position by crediting the inflow of investment to capital account. Also, current account improves as FDI aids import substitution/export promotion. Exports get a boost through the expertise of foreign investors possessing export market intelligence and their mechanism. Updated technology of producing world standard goods at low cost are available to the host country. Export credits from the cheapest source in the international market can be availed of quite easily.

(b) Foreign firms foster forward and backward economic linkages. Demand for various inputs give rise to the development of the supplying industries which through employment of labour force raise their income and increase the demand for domestic industrial production. The living

standard of the domestic consumers improves as quality products at competitive prices are available. Also a pool of trained personnel is created in this context.

(c) Foreign investors by investing in economic / social infrastructure, financial markets and marketing systems helps the host country to develop a support base essential for quick industrialisation. The presence of foreign investors creates a multiplier effect leading to the emergence of a sound support system.

(d) Foreign investors are a boon to government to revenue with regard to the generation of additional income tax. Also they pay tariff on their imports. Governmental expenditure requirements are greatly reduced through supplementing government's investment activities in a big way there by lessening the burden on national budget.

(e) FDI aids to maintain a proper balance amongst the factors of production by the supply of scarce resources thereby accelerating economic growth. Capital brought in by FDI supplements domestic capital as the savings rate at home is very low to augment heavy investment. Through the inflow of scarce foreign exchange, domestic savings get a boost to support the investment process. Foreign investors are bold enough to take risks not prevalent among local investors resulting in investment projects being implemented in a large way. FDI's bring in skilled labour force to perform jobs which the local workers are unable to carry out. There is also a fear of imposition of alien culture being imposed on the local labour force. Foreign investors make available key raw materials along with updated technology to the host country. Such a practice helps the host country to obtain access to continued updation of R&D work of the investing country.

2.2 For Home Country : The home country gets the benefit of the supply of raw materials if FDI helps in its exploitation. BOP improves due to the parent company getting dividend, royalty, technical service fees and also from its increased exports to the subsidiary. Also there is employment generation and the parent company enters into newer financial markets by its investment outside. The government of the home country increases its revenue income of the parent organization, imposition of tariff on imports of the parent company from its foreign subsidiary. FDI helps to develop closer political relationship between the home and the host country which is advantageous to both.

3. Foreign Institutional Investment

Positive tidings about the Indian economy combined with a fast-growing market have made India an attractive destination for foreign institutional investors (FIIs). FIIs were allowed to make portfolio investments in the country's stock markets in the early 1990s.

A number of these investors are Japanese and European funds aiming to cash in on the rising equity markets in India. In addition, there was increased registration by non-traditional countries like Denmark, Italy, Belgium, Canada and Sweden. The Japanese have, in fact, been increasing their foothold in India. Mizuho Corporate Bank's decision to successfully expand base in the country has managed to convince almost 60-65 major Japanese corporates to set up manufacturing or marketing base in India. This list of corporates includes big names in auto sectors such as Honda, Toyota and Yamaha, as well as those in home appliances, pharmaceuticals, and communications.

Part – B
International Financial Management - Including Raising of Capital Abroad (ADRs, GDRs, ECB)

1. Introduction

The essence of financial management is to raise and utilise the funds effectively. This also holds good for the procurement of funds in the international capital markets, for a multi-national organisation in any currency. There are various avenues for a multi-national organisation to raise funds either through internal or external sources. Internal funds comprise share capital, loans from parent company and retained earnings. Now a days external funds can be raised from a number of sources. The various sources of international finance are discussed in this chapter.

1.1 External Commercial Borrowings: External Commercial Borrowings (ECB) are defined to include

1. commercial bank loans,
2. buyer's credit,
3. supplier's credit,
4. securitised instruments such as floating rate notes, fixed rate bonds etc.,
5. credit from official export credit agencies,
6. commercial borrowings from the private sector window of multilateral financial institutions such as IFC, ADB, AFIC, CDC etc. and
7. Investment by Foreign Institutional Investors (FIIs) in dedicated debt funds

Applicants are free to raise ECB from any internationally recognised source like banks, export credit agencies, suppliers of equipment, foreign collaborations, foreign equity - holders, international capital markets etc. Offers from unrecognised sources will not be entertained.

ECB entitlement for new projects

All infrastructure and Greenfield projects	50% of the total project cost
Telecom Projects	upto 50% of the project cost (including license fees)

In the case of power projects, greater flexibility will be allowed, based on merits.

End - use

(a) ECBs are to be utilised for foreign exchange costs of capital goods and services (on FOB and CIF basis).

Proceeds should be utilized at the earliest and corporates should comply with RBI's guidelines on parking ECBs outside till actual imports. RBI would be monitoring ECB proceeds parked outside.

However, in the case of infrastructure projects in the power, telecommunications and railway sectors, ECB can be utilised for project - related rupee expenditure. License fee payments would be an approved use of ECB in the telecom sector.

(b) ECB proceeds may also be utilised for project - related rupee expenditure, as outlined above. Proceeds must be brought into the country immediately.

However, under no circumstances, ECB proceeds will be utilized for:

- (i) investment in the stock market
- (ii) speculation in real estate
- (c) ECB may be raised to acquire ships/vessels from Indian shipyards

Proceeds from Bonds & FRN

Corporates who have raised ECB through Bond/ FRN issues are permitted to use the proceeds from the issue for project related rupee expenditure till actual import of capital equipments takes place or up to one year, whichever is less. Sanction of additional ECB to the company would be considered only after the company has certified through its statutory auditor that it has fully utilised the amount for import of the capital equipment and services.

Other terms and conditions

Apart from the maturity and end - use requirements, the financial terms and conditions of each ECB proposal are required to be reasonable and market - related. The choice of the sourcing of ECB, currency of the loan, and the interest rate basis (i.e. floating or fixed), will be left to the borrowers.

- **Security:** The choice of security to be provided to the lenders/ suppliers will also be left to the borrowers. However, where the security is in the form of a guarantee from an Indian financial institution or from an Indian scheduled commercial bank, counter - guarantee or confirmation of the guarantee by a foreign bank/ foreign institution will not be permitted.
- **Exemption from withholding tax:** All interest payments and fees etc. related to external commercial borrowings would be eligible for withholding tax exemption under various Sections of the Income Tax Act, 1961.
- **Approval under Foreign exchange regulation:** After receiving the approval from the ECB Division, Department of Economic Affairs, Ministry of Finance, the applicant is required to obtain approval from the Reserve Bank of India and to submit an executed copy of the loan agreement to this department for taking the same on record, before obtaining clearance from the RBI for drawing the loan. Monitoring of end use of ECB will continue to be done by RBI.
- **Short - term loan from RBI:** While external commercial borrowing for minimum maturity of three years and above will be sanctioned by the Department of Economic Affairs, Ministry of Finance, approvals for short term foreign currency loans with a maturity of less than three years will be sanctioned by the RBI, according to the RBI guidelines.

11.6 Strategic Financial Management

- **Validity of approval:** Approvals are valid for an initial period of three months, i.e. the executed copy of the loan agreement is required to be submitted within this period.

1.2 International Capital Market: It is well known today that modern organizations including multinationals largely depend upon sizable borrowings in rupees as well as in foreign currencies to finance their projects involving huge outlays. The taxation benefits available on borrowings as against the capital often influence this course as interest payment on borrowed funds is an allowable expenditure for tax purposes.

In order to cater to the financial needs of such organisations international capital markets or financial centres have sprung up wherever international trade centres have developed. Lending and borrowing in foreign currencies to finance the international trade and industry has led to the development of international capital market.

In domestic capital markets of various countries, international capital transactions also take place. For instance, USA, Japan, UK, Switzerland, West Germany have active domestic capital markets. Foreign borrowers raise money in these capital markets through issue of 'foreign bonds'. (Note: International bond and Euro bond are NOT the same and hence deleted). An International Bond issue is managed by a syndicate of international banks and placed with investors and lenders worldwide. The issue may be denominated in any of the currencies for which liquid market exist.

In international capital market, the availability of foreign currency is assured under the four main systems viz.

- (1) Euro - currency market;
- (2) Export Credit Facilities;
- (3) Bonds issues, and
- (4) Financial Institutions.

Euro-Currency market was originated with dollar dominated bank deposits and provide loans in Europe particularly, in London. Euro-dollar deposits form the main ingredient of Euro-currency market. Euro-dollar deposits are dollar denominated time deposits available at foreign branches of US banks and at some foreign banks. These deposits are acquired by these banks from foreign Governments and various firms and individuals who want to hold dollars outside USA. Banks based in Europe accept dollar denominated deposits and make dollar denominated loans to the customers. This forms the basis of Euro-currency market spread over various parts of the world. In Euro-currency market, funds are made available as loans through syndicated Euro-credit or instruments known as Floating Rate Notes FRNs/FRCs (certificates of deposits). London has remained as the main centre for Euro-currency credit.

The creditors however insist on bank guarantees. Several multinational banks of Japanese, American, British, German and French origin - operate all over the world, extending financial assistance for trade and projects. Several multinational banks like Citi Bank, Standard Chartered bank, American Express, Bank of America, etc. are aggressive players in India and they issue specific bank guarantees to facilitate the business transactions between various

parties, including government agencies. Commercial borrowings as well as Exim Bank finance, however, constitute major cost.

2. Instruments of International Finance

The various financial instruments dealt with in the international market are briefly described below :

- 1. Euro Bonds:** A *Eurobond* is an international bond that is denominated in a currency not native to the country where it is issued. Also called external bond e.g. A Yen floated in Germany; a yen bond issued in France.
- 2. Foreign Bonds:** These are debt instruments denominated in a currency which is foreign to the borrower and is denominated in a currency that is native to the country where it is issued. A British firm placing \$ denominated bonds in USA is said to be selling foreign bonds.
- 3. Fully Hedged Bonds:** In foreign bonds, the risk of currency fluctuations exist. Fully hedged bonds eliminate that risk by selling in forward markets the entire stream of interest and principal payments.
- 4. Floating Rate Notes:** These are debt instruments issued upto 7 years maturity. Interest rates are adjusted to reflect the prevailing exchange rates. They provide cheaper money than fixed rate debt instruments; however, they suffer from inherent interest rate volatility risk..
- 5. Euro Commercial Papers:** Euro Commercial Papers (ECPs) are short-term money market instruments. They are for maturities for less than a year. They are usually designated in US dollars.

3. Financial Sector Reforms in India

The Government of India, as a part of liberalisation and de-regulation of industry and to augment the financial resources of Indian companies, has allowed the companies to directly tap foreign resources for their requirements. As a result of measures initiated by the Government, various foreign companies established their business and various companies are coming to do business in India. The Government has given the signals that foreign investment is now welcome and that non-priority industries are not prohibited. The reasons for the foreign investors' interest in India are the low returns prevalent in the USA and Europe. India's large middle class is even more than the population of some of the countries and provides good marketing potential. Beside this the availability of skilled and cheap labour, the wide-spread use of English language, are also some of the contributory factors for the globalisation of Indian business.

It is now possible in India that a foreign company may invest directly in a joint venture or in an Indian subsidiary. It may also route its investment through a third country by forming a subsidiary in that country, which in turn, invests in India. Most of foreign companies prefer to have joint venture with an Indian partner, who understands the local environment and is able to exploit the business opportunities. India is being used as a low cost manufacturing base for sourcing exports to third countries also, without paying much tax. A company wanting to start operations immediately can directly set up a venture undertaking.

4. International Financial Instruments and Indian Companies

Indian companies have been able to tap global markets to raise foreign currency funds by issuing various types of financial instruments which are discussed as follows :

4.1 Foreign Currency Convertible Bonds (FCCBs): A type of convertible bond issued in a currency different than the issuer's domestic currency. In other words, the money being raised by the issuing company is in the form of a foreign currency. A convertible bond is a mix between a debt and equity instrument. It acts like a bond by making regular coupon and principal payments, but these bonds also give the bondholder the option to convert the bond into stock.

These types of bonds are attractive to both investors and issuers. The investors receive the safety of guaranteed payments on the bond and are also able to take advantage of any large price appreciation in the company's stock. (Bondholders take advantage of this appreciation by means of warrants attached to the bonds, which are activated when the price of the stock reaches a certain point.) Due to the equity side of the bond, which adds value, the coupon payments on the bond are lower for the company, thereby reducing its debt-financing costs.

FCCBs is a bond issued in accordance with the guidelines, dated 12th November, 1993 as amended from time to time and subscribed for by non-residents in foreign Currency and Convertible into ordinary / equity shares of the issuer company in any manner whether in whole or in part or on the basis of any equity related warrants attached to debt instruments.

Advantages of FCCBs

- (i) The convertible bond gives the investor the flexibility to convert the bond into equity at a price or redeem the bond at the end of a specified period, normally three years if the price of the share has not met his expectations.
- (ii) Companies prefer bonds as it leads to delayed dilution of equity and allows company to avoid any current dilution in earnings per share that a further issuance of equity would cause.
- (iii) FCCBs are easily marketable as investors enjoys option of conversion into equity if resulting to capital appreciation. Further investor is assured of a minimum fixed interest earnings.

Disadvantages of FCCBs

- (i) Exchange risk is more in FCCBs as interest on bonds would be payable in foreign currency. Thus companies with low debt equity ratios, large forex earnings potential only opt for FCCBs.
- (ii) FCCBs mean creation of more debt and a forex outgo in terms of interest which is in foreign exchange.
- (iii) In the case of convertible bonds, the interest rate is low, say around 3–4% but there is

exchange risk on the interest payment as well as re-payment if the bonds are not converted into equity shares. The only major advantage would be that where the company has a high rate of growth in earnings and the conversion takes place subsequently, the price at which shares can be issued can be higher than the current market price.

Many Indian Companies had raised FCCBs during the bull run period of 2005-2008 (Prime Data Base: 201 companies raising about ₹ 72,000 crores). These FCCBs are due for conversion from 2011-12, when the current market prices are much below the conversion prices. Hence, it is expected that FCCB dream could turn out to be a nightmare for India Inc. As per reports emanating, Wockhardt, Cranes Software, Aftok, JCT, Marksans Pharma, Mascon Global, Gremach, Pyramid Saimira and Zenith Infotech have defaulted on either repayment of the FCCB or on the coupon payments. More companies are expected to join this list.

4.2 Global Depository Receipts (GDRs): A depository receipt is basically a negotiable certificate, denominated in a currency not native to the issuer, that represents the company's publicly - traded local currency equity shares. Most GDRs are denominated in USD, while a few are denominated in Euro and Pound Sterling. The Depository Receipts issued in the US are called American Depository Receipts (ADRs), which anyway are denominated in USD and outside of USA, these are called GDRs. In theory, though a depository receipt can also represent a debt instrument, in practice it rarely does. DRs (depository receipts) are created when the local currency shares of an Indian company are delivered to the depository's local custodian bank, against which the Depository bank (such as the Bank of New York) issues depository receipts in US dollar. These depository receipts may trade freely in the overseas markets like any other dollar-denominated security, either on a foreign stock exchange, or in the over-the-counter market, or among a restricted group such as Qualified Institutional Buyers (QIBs). Indian issues have taken the form of GDRs to reflect the fact that they are marketed globally, rather than in a specific country or market. Rule 144A of the Securities and Exchange Commission of U.S.A permits companies from outside USA to offer their GDRs to certain institutional buyers. These are known as Qualified Institutional Buyers (QIBs). There are institutions in USA which, in the aggregate, own and invest on a discretionary basis at least US \$ 100 million in eligible securities.

Through the issue of depository receipts, companies in India have been able to tap global equity market to raise foreign currency funds by way of equity. Quite apart from the specific needs that Indian companies may have for equity capital in preference to debt and the perceived advantages of raising equity over debt in general (no repayment of "principal" and generally lower servicing costs, etc.) the fact of the matter is quite simple, that no other form of term foreign exchange funding has been available. In addition, it has been perceived that a GDR issue has been able to fetch higher prices from international investors (even when Indian issues were being sold at a discount to the prevailing domestic share prices) than those that a domestic public issue would have been able to extract from Indian investors.

11.10 Strategic Financial Management

- **Impact of GDRs on Indian Capital Market**

Since the inception of GDRs a remarkable change in Indian capital market has been observed as follows:

- (i) Indian stock market to some extent is shifting from Bombay to Luxemburg.
- (ii) There is arbitrage possibility in GDR issues.
- (iii) Indian stock market is no longer independent from the rest of the world. This puts additional strain on the investors as they now need to keep updated with world wide economic events.
- (iv) Indian retail investors are completely sidelined. GDRs/Foreign Institutional Investors' placements + free pricing implies that retail investors can no longer expect to make easy money on heavily discounted rights/public issues.

As a result of introduction of GDRs a considerable foreign investment has flown into India.

- **Markets of GDRs**

- (i) GDR's are sold primarily to institutional investors.
- (ii) Demand is likely to be dominated by emerging market funds.
- (iii) Switching by foreign institutional investors from ordinary shares into GDRs is likely.
- (iv) Major demand is also in UK, USA (Qualified Institutional Buyers), South East Asia (Hong kong, Singapore), and to some extent continental Europe (principally France and Switzerland).

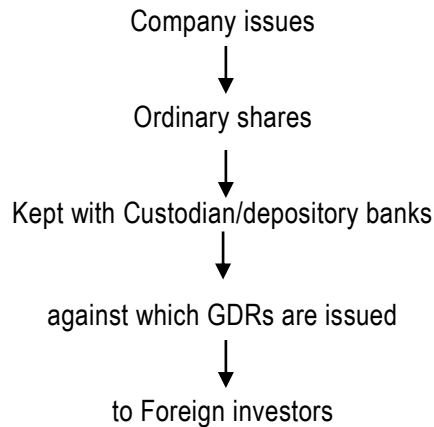
- **Profile of GDR investors**

The following parameters have been observed in regard to GDR investors.

- (i) Dedicated convertible investors
- (ii) Equity investors who wish to add holdings on reduced risk or who require income enhancement.
- (iii) Fixed income investors who wish to enhance returns.
- (iv) Retail investors: Retail investment money normally managed by continental European banks which on an aggregate basis provide a significant base for Euro-convertible issues.

Global Depository Receipt with Warrant (GDR with warrant) : These receipts were more attractive than plain GDRs in view of additional value of attached warrants. The Government of India has however, prohibited Indian companies to issue GDRs with warrants as per guidelines issued on 28.10.94.

The mechanics of a GDR issue may be described with the help of following diagram.



Characteristics

- (i) Holders of GDRs participate in the economic benefits of being ordinary shareholders, though they do not have voting rights.
- (ii) GDRs are settled through CEDEL & Euro-clear international book entry systems.
- (iii) GDRs are listed on the Luxemburg stock exchange.
- (iv) Trading takes place between professional market makers on an OTC (over the counter) basis.
- (v) The instruments are freely traded.
- (vi) They are marketed globally without being confined to borders of any market or country as it can be traded in more than one currency.
- (vii) Investors earn fixed income by way of dividends which are paid in issuer currency converted into dollars by depository and paid to investors and hence exchange risk is with investor.
- (viii) As far as the case of liquidation of GDRs is concerned, an investor may get the GDR cancelled any time after a cooling off period of 45 days. A non-resident holder of GDRs may ask the overseas bank (depository) to redeem (cancel) the GDRs. In that case overseas depository bank shall request the domestic custodians bank to cancel the GDR and to get the corresponding underlying shares released in favour of non-resident investor. The price of the ordinary shares of the issuing company prevailing in the Bombay Stock Exchange or the National Stock Exchange on the date of advice of redemption shall be taken as the cost of acquisition of the underlying ordinary share.

Illustration 1

X Ltd. is interested in expanding its operation and planning to install manufacturing plant at US. For the proposed project it requires a fund of \$ 10 million (net of issue expenses/ floatation cost). The estimated floatation cost is 2%. To finance this project it proposes to issue GDRs.

You as financial consultant is required to compute the number of GDRs to be issued and cost of the GDR with the help of following additional information.

11.12 Strategic Financial Management

- (i) Expected market price of share at the time of issue of GDR is ₹ 250 (Face Value ₹ 100)
- (ii) 2 Shares shall underly each GDR and shall be priced at 10% discount to market price.
- (iii) Expected exchange rate ₹ 60/\$.
- (iv) Dividend expected to be paid is 20% with growth rate 12%.

Solution

Net Issue Size = \$10 million

$$\text{Gross Issue} = \frac{\$10 \text{ million}}{0.98} = \$ 10.204 \text{ million}$$

Issue Price per GDR in ₹ (200 x 2 x 90%)	₹ 450
Issue Price per GDR in \$ (₹ 450/ ₹ 60)	\$ 7.50
Dividend Per GDR (D ₁) (₹ 20 x 2)	₹ 40
Net Proceeds Per GDR (₹ 450 x 0.98)	₹ 441.00

- (a) Number of GDR to be issued

$$\frac{\$10.204 \text{ million}}{\$7.50} = 1.3605 \text{ million}$$

- (b) Cost of GDR to Odessa Ltd.

$$k_e = \frac{60.00}{441.00} + 0.12 = 21.07\%$$

4.3 Euro-Convertible Bonds (ECBs): A convertible bond is a debt instrument which gives the holders of the bond an option to convert the bond into a predetermined number of equity shares of the company. Usually, the price of the equity shares at the time of conversion will have a premium element. The bonds carry a fixed rate of interest. If the issuer company desires, the issue of such bonds may carry two options viz.

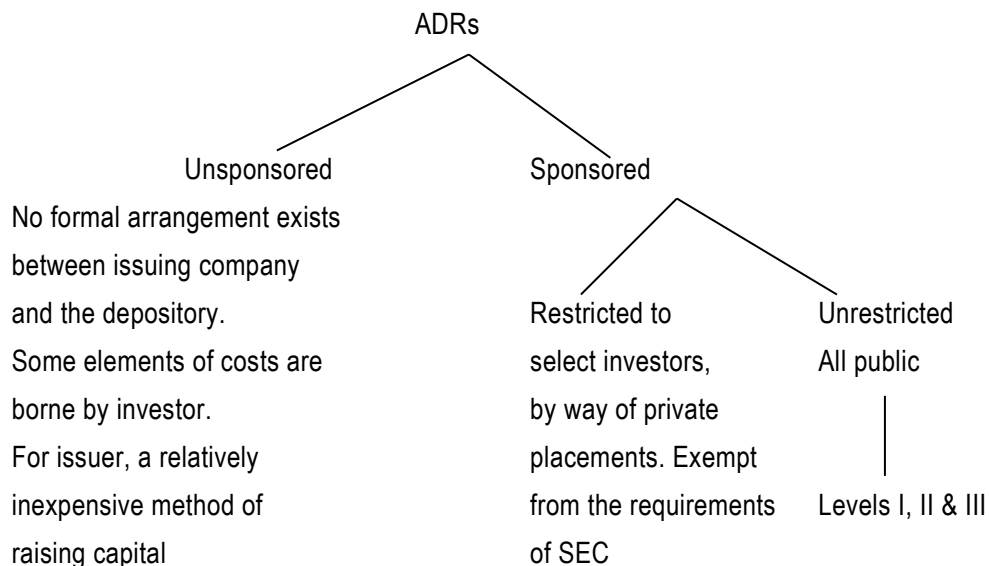
- (i) Call Options: (Issuer's option) - where the terms of issue of the bonds contain a provision for call option, the issuer company has the option of calling (buying) the bonds for redemption before the date of maturity of the bonds. Where the issuer's share price has appreciated substantially, i.e. far in excess of the redemption value of the bonds, the issuer company can exercise the option. This call option forces the investors to convert the bonds into equity. Usually, such a case arises when the share prices reach a stage near 130% to 150% of the conversion price.
- (ii) Put options - A provision of put option gives the holder of the bonds a right to put (sell) his bonds back to the issuer company at a pre-determined price and date. In case of Euro-convertible bonds, the payment of interest on and the redemption of the bonds will be made by the issuer company in US dollars.

4.4 American Depository Receipts (ADRs): Depository receipts issued by a company in the United States of America (USA) is known as American Depository Receipts (ADRs). Such receipts have to be issued in accordance with the provisions stipulated by the Securities and Exchange Commission of USA (SEC) which are very stringent.

An ADR is generally created by the deposit of the securities of a non-United States company with a custodian bank in the country of incorporation of the issuing company. The custodian bank informs the depository in the United States that the ADRs can be issued. ADRs are United States dollar denominated and are traded in the same way as are the securities of United States companies. The ADR holder is entitled to the same rights and advantages as owners of the underlying securities in the home country. Several variations on ADRs have developed over time to meet more specialised demands in different markets. One such variation is the GDR which are identical in structure to an ADR, the only difference being that they can be traded in more than one currency and within as well as outside the United States.

There are three types of ADRs:

ADRs are issued by entities incorporated in the USA in compliance with the conditions laid down by the Securities and Exchange Commission (SEC) of USA. ADRs are also denominated in US Dollars, and are traded in the same way as other listed securities are traded in the US stock markets. The holders of ADRs are entitled to rights and advantages comparable to the owners of underlying securities in the home country. Over time, a few variants of ADRs have emerged, features of which are summarized below:



Un-sponsored ADRs are issued without any formal agreement between the issuing company and the depository, although the issuing company must consent to the creation of the ADR facility. With un-sponsored ADRs, certain costs, including those associated with disbursement of dividends, are borne by the investor. For the issuing company, they provide a relatively inexpensive method of

11.14 Strategic Financial Management

accessing the United States capital markets (especially because they are also exempt from most of reporting requirements of the Securities and Exchange Commission).

Sponsored ADRs are created by a single depository which is appointed by the issuing company under rules provided in a deposit agreement. There are two broad types of sponsored ADRs - those that are restricted with respect to the type of buyer which is allowed, and are therefore privately placed; and those that are unrestricted with respect to buyer and are publicly placed and traded. Restricted ADRs (RADRs) are allowed to be placed only among selected accredited investors and face restrictions on their resale. As these are not issued to the general public, they are exempt from reporting requirements of the Securities and Exchange Commission and are not even registered with it. Restricted ADR issues are sometimes issued by companies that seek to gain some visibility and perhaps experience in the United States capital markets before making an unrestricted issue.

Unrestricted ADRs (URADRs) are issued to and traded by the general investing public in United States capital markets. There are three classes of URADR, each increasingly demanding in terms of reporting requirements to the Securities and Exchange Commission, but also increasingly attractive in terms of degree of visibility provided. Level I URADRs are exempt from the requirements that the issuing company conform their financial statistics to United States Generally Accepted Accounting Principles (GAAP), as well as from full reporting requirements of the Securities and Exchange Commission. They are also therefore relatively low cost. Level II URADRs are generally issued by companies that wish to be listed on one of the United States national exchanges. The issuing company must meet the Securities and Exchange Commission's full disclosure requirements, their financial statements must conform to United States GAAP and the company must meet the listing requirements of the relevant exchange. They are therefore more costly for the issuing company, but the public listing allows much higher visibility and makes the facility more attractive to potential investors. Level III URADRs are issued by companies which seek to raise capital in the United States securities markets by making a public offering of their securities. They must also make full Securities and Exchange Commission disclosure, conform to United States GAAP and meet relevant exchange requirements, and provide the highest degree of visibility of any ADR.

Companies that apply for either listing or public issue of securities on the national exchanges of the United States must meet exchange requirements. These include specific minimum requirements with respect to the size of total assets, earnings and/or shareholders equity. These requirements, along with the reporting requirements, serve to make it difficult for small capitalization companies of emerging markets to issue either Level II or Level III URADRs. A large number of ADRs are therefore offered through private placement, especially under Rule 144A, where activity is reported to be strong. Rule 144A, passed by the Securities and Exchange Commission in 1990, eased restrictions on the resale by qualified institutional buyers of private ADR issues amongst themselves once these issues were made under this rule. Typical ADR issues appear to be relatively large. Emerging market ADR issuers tend to be large domestic companies with considerable financial resources and high international visibility. Relatively small ADR issues appear to measure in the range of between \$15 million and \$80 million, while many mid-sized issues fall within the range of \$100 million to \$300 million. Several exceptionally large issues have exceeded \$1 billion in size.

Foreign Direct Investment (FDI) and Foreign Institutional Investment (FIIs) 11.15

From the investor's point of view, ADRs lower the cost of trading non-United States companies' securities. Trades are settled in the United States within five working days (or less, given the increasingly heavy volume of trading in ADRs), whereas trades overseas can take a much longer time and raise significantly settlement risk. The depository provides both settlement and clearance services. As the facilities are traded in the United States, there is a much lower information search cost, and the problems of unfamiliarity with foreign markets and foreign laws, regulations and trading practices are overcome. The difficulties associated with locating a broker and/or custodian in the foreign market and the fees charged for these services are also avoided, and so are the obstacles that foreign languages may present. A major advantage of ADRs to the investor is that dividends are paid promptly and in United States dollars. Furthermore, the facilities are registered in the United States so that some assurance is provided to the investor with respect to the protection of ownership rights. These instruments also obviate the need to transport physically securities between markets. Communication services are also provided by the depository including provision of periodic reports on the issuing company (in English) in a format familiar to United States investors. Important information pertinent to the issuing company is transmitted to the investor by the depository. Together, these advantages provide an incentive for investors in the United States capital markets to invest in the equity of emerging markets via ADRs.

For the issuing company, the main costs of ADRs are the cost of meeting the partial or full reporting requirements of the Securities and Exchange Commission and the exchange fees (for relevant classes of ADRs). However, ADRs can be useful means for issuing companies of gaining access to United States capital markets. Thus, institutional investors that are precluded by their charter from holding foreign securities are able to invest in such securities via ADRs. They can also allow foreign investors to avoid constraints that may be placed on such investments in cases where emerging markets still maintain limits on direct investment by foreigners. In general, ADRs increase access to United States capital markets by lowering the costs of investing in the securities of non-United States companies and by providing the benefits of a convenient, familiar and well regulated trading environment. Issues of ADRs can increase the liquidity of an emerging market issuer's shares, and can potentially lower the future cost of raising equity capital by raising the company's visibility and international familiarity with the company's name, and by increasing the size of the potential investors base.

Emerging-market ADRs are in many instances issued by newly privatised companies. A small number of economies in transition (the Russian Federation in particular) have started to use depository receipts as a way of attracting foreign investment, despite lingering difficulties associated with aspects of their market infrastructure, such as transparency of financial statements, long settlement periods and potentially unreliable registration practices. The limited development, or lack of, domestic debt and equity markets in these countries makes access to foreign capital markets critical. In other cases, issues have been created by large and well known companies from emerging markets that are active in the ADR market (such as Mexico, Brazil and India), or countries with relatively good international credit ratings and a relatively long history of accessing foreign investment (such as the Republic of Korea and China). There have been noticeably few issues from companies in low-income countries (apart from India, and to lesser extent, China), and only a handful in least developed countries. The

11.16 Strategic Financial Management

few issues made by the latter group of countries have been mainly by companies involved in the minerals, oil, banking and utilities industries that can be expected to be able to attract foreign financing. The growth in the number of issues from transition economies between 1992 and 1996, however, is quite noticeable (especially from Russia and Hungary).

One disadvantage of depository-receipt issues for the foreign markets in which the issuing company is incorporated is the disincentive to the development of a local capital market. Companies in emerging markets may issue ADRs because the underlying share issues may represent a relatively large volume of weekly or monthly trading activity and the domestic stock market may be considered too small to absorb the issues. While individual companies may be able to attract additional financing, at the macro economic level, an increasing trend towards emerging market issue of ADRs can retard the development of domestic capital markets by denying domestic markets additional instruments in which to invest.

In a bid to bypass the stringent disclosure norms mandated by the Securities Exchange Commission (SEC) of the US for equity issues, the Indian companies have, however, chosen the indirect route to tap the vast American financial market through private debt placement of GDRs listed in London and Luxemburg stock exchanges.

The Indian companies have preferred the GDRs to ADRs (American depository receipts) because the US market exposes them to a higher level of responsibility than a European listing in the areas of disclosure costs, liability and timing.

The companies have chosen the private placement route which allows them to mobilise vast amounts of debt vide Rule 144A of Securities Exchange Commission of USA. Some of the major power companies have drawn up plans to mobilise debts through this private placement route.

Even the merchant bankers of international repute have not recommended a SEC-registered ADR issue as an alternative option for an Indian issuer due to increased responsibilities required in conjunction with a US listing.

The Securities Exchange Commission's regulations set up to protect the retail investor base, are somewhat more stringent and onerous, even for companies already listed and held by retail investors in their home country. The most onerous aspect of a US listing for the companies is the necessity to provide full and half year account in accordance with, or at least reconciled to US GAAP.

Another prohibitive aspect of an ADR issue is the cost involved. As per the estimates, the cost of preparing and filing US GAAP account only ranges from \$500,000 to \$1,000,000 with the ongoing cost of \$ 150,000 to \$ 200,000 per annum. Because of the additional work involved, legal fees are considerably higher for a US listing, which ranges between \$250,000 to \$ 350,000 for the underwriters, to be reimbursed by the issuer.

In addition, the initial Securities Exchange Commission registration fees which are based on a percentage of the issue size as well as 'blue sky' registration costs (permitting the securities to be offered in all States of the US) will have to be met.

It has further been observed that while implied legal responsibility lies on a company's directors for the information contained in the offering document as required by any stock exchange, the US is widely recognised as the 'most litigious market in the world'. Accordingly, the broader the target investor base in the US (such as retail investors), the higher the potential legal liability.

The increasing legal problem is evident from the larger number of actions being taken by investors against the directors of companies whose share offerings have not performed according to expectations. That is why Indian Companies have so far preferred the route of GDRs rather than ADRs.

4.5 Indian Depository Receipts (IDRS): Like ADRs and GDRs developments in financial arena have created enormous investment opportunities for Indian investors abroad and vice-versa. Indian companies are raising finance from abroad and are available on foreign exchanges to raise finance by way of American Depository Receipts (ADRs) and Global Depository Receipts (GDRs). Similarly, foreign companies can raise finance in India in the form of Indian Depository Receipts (IDRs), which are listed in India. This enables Indians to invest in foreign companies on Indian Stock Exchanges.

The companies would however be required to fulfill a number of guidelines for listing in India through an IDR issue. This opens up a new possibility for Indian investors where they can also diversify their portfolios. This kind of phenomena is common across the various markets throughout the world.

4.6 Debt Route for Foreign Exchange Funds: The following are some of the instruments used for borrowing of funds from the International Market.

- **Euro-Convertible Zero Bonds:** These bonds are structured as a convertible bond. No interest is payable on the bonds. But conversion of bonds takes place on maturity at a pre-determined price. Usually there is a 5 years maturity period and they are treated as a deferred equity issue.
- **Euro-bonds with Equity Warrants:** These bonds carry a coupon rate determined by the market rates. The warrants are detachable. Pure bonds are traded at a discount. Fixed income funds' managements may like to invest for the purposes of regular income.
- **Syndicated bank loans:** One of the earlier ways of raising funds in the form of large loans from banks with good credit rating, can be arranged in reasonably short time and with few formalities. The maturity of the loan can be for a duration of 5 to 10 years. The interest rate is generally set with reference to an index, say, LIBOR plus a spread which depends upon the credit rating of the borrower. Some covenants are laid down by the lending institution like maintenance of key financial ratios.
- **Euro-bonds:** These are basically debt instruments denominated in a currency issued outside the country of that currency for examples Yen bond floated in France. Primary attraction of these bonds is the refuge from tax and regulations and provide scope for arbitraging yields. These are usually bearer bonds and can take the form of
 - (i) Traditional fixed rate bonds.

11.18 Strategic Financial Management

- (ii) Floating rate Notes.(FRNs)
- (iii) Convertible Bonds.
- **Foreign Bonds:** Foreign bonds are denominated in a currency which is foreign to the borrower and sold at the country of that currency. Such bonds are always subject to the restrictions and are placed by that country on the foreigners funds.
- **Euro Commercial Papers:** These are short term money market securities usually issued at a discount, for maturities less than one year.
- **External Commercial Borrowings:** ECB include bank loans, supplier credit, securitised instruments, credit from export credit agencies and borrowings from multilateral financial institutions. These securitised instruments may be FRNs, FRBs etc. Indian corporate sector is permitted to raise finance through ECBs within the framework of the policies and procedures prescribed by the Central Government. Multilateral financial institutions like IFC, ADB, AFIC, CDC are providing such facilities while the ECB policy provides flexibility in borrowing consistent with maintenance of prudential limits for total external borrowings, its guiding principles are to keep borrowing maturities long, costs low and encourage infrastructure/core and export sector financing which are crucial for overall growth of the economy. The government of India, from time to time changes the guidelines and limits for which the ECB alternative as a source of finance is pursued by the corporate sector. During past decade the government has streamlined the ECB policy and procedure to enable the Indian companies to have their better access to the international financial markets.

The government permits the ECB route for variety of purposes namely expansion of existing capacity as well as for fresh investment. But ECB can be raised through internationally recognized sources. There are caps and ceilings on ECBs so that macro economy goals are better achieved. Units in SEZ are permitted to use ECBs under a special window.

5. Euro-Issues

A Euro-issue does not mean the shares (directly or indirectly) get listed on a European Stock Exchange. For example, ADR is a Euro-Issue, as much as a GDR is. And ADRs are listed in the USA. However, subscription can come from any part of the world except India. Finance can be raised by Global Depository Receipts (GDRs), Foreign Currency Convertible Bonds (FCCB) and pure debt bonds. However, GDRs, and FCCBs are more popular instruments. These instruments have been described earlier:

5.1 Eligibility of Companies for Euro-Issue: The Government of India has formulated a scheme of allowing Indian companies to issue equity/convertible bonds in the international markets after Government approval. However, companies with the following profile are the ones that may embark on a Euro-issue.

- (i) Good financial track record at least for a period of three years.

- (ii) Market price stability
- (iii) Market capitalisation
- (iv) Good industry prospects
- (v) Good company growth including EPS
- (vi) Better quality management
- (vii) Sound investment policies

5.2 Advantages of Euro-Issues: The terms of Euro- issues are far more attractive than those available in the domestic primary market. The international capital markets have tremendous absorption power.

Moreover, management control may not be immediately affected due to restrictive voting rights provision in depository agreement or through issues of convertible bonds. Euro-issues also enhance potential for future offshore fund raising.

- **For Company:** The advantages of a Euro-issue for a company are many.
 - (i) First of all the attractive pricing of Euro-issues has drawn the attention of Indian companies and they have resorted to Euro-issues considerably during the recent years. Euro-issues are priced around the market price of share. In fact, in the case of Euro-convertibles, the shares eventually get issued at a premium to the ruling market price. This results in dramatic reduction in the cost of the capital to the company.

If we compare the cost of Euro issue which is generally 4.5% with the 17 to 20 per cent for working capital borrowings (this is a dangerous statement to make because the companies that can make Euro Issues have to be Blue Chips are next to Blue Chips and such companies will not be borrowing at 17 to 20% on bank borrowings for working capital), that has to be paid to the bankers, the former seem to be quite attractive and that is why business houses are increasingly resorting to the Euro-issues. This type of pricing is just not possible in the domestic primary market because the local investors have been so used to issues which have a small premium on the par value that they do not easily accept an issue at market prices.

- (ii) Secondly, the foreign exchange fluctuations are to the account of investor and not to the company. Since the investors in Euro-issues become shareholders, a depreciation in the value of the Indian rupee only affects investor profits and does not lead to any extra outflow for the company. Whereas, if a company took a foreign currency loan, the exchange fluctuations is to the account of the company. That is why, Indian business has learnt the hard way during the last decade that a seemingly low interest rate forex loan can be a dangerous proposition when the local currency (Indian rupee) tumbles.

11.20 Strategic Financial Management

- (iii) Another advantage of Euro-issues, which was earlier available and has however now been frozen by the revised guidelines, arose out of the fact that earlier there was very little monitoring over the end-use of funds collected through such issues. Companies could raise money at cheap cost and make a profit either by investing in the stock market or lending in the inter-corporate market. If for example, a company raised ₹300 crores at 4 per cent cost and lent it at 20 per cent, it makes a profit of ₹ 48 crores. In some of the cases, this may be more than the profit it makes from its regular business. Further more, its balance sheet also looks healthier with burgeoning reserves and bonus possibilities.
- (iv) This enhances the image of the company's products, services or financial instruments in a market place outside their home country. This also provides a mechanism for raising capital or as a vehicle for an acquisition.
- **Benefits to the Investors:** Euro issues also provides a number of advantages to foreign investors. Increasingly, investors are aiming to diversify their portfolios internationally. Obstacles, however, such as undependable settlements, costly conversions, unreliable custody services, poor information flow, unfamiliar market practices, confusing tax conventions etc. may discourage institutions and private investors from venturing outside the local market. As a result, more and more investors are using GDRs route. The investors are, however, benefited since.
 - (i) GDRs are usually quoted in dollars, and interest and dividend payments are also in dollars.
 - (ii) GDRs overcome obstacles that mutual funds, pension funds and other institutions may have in purchasing and holding securities outside their domestic markets.
 - (iii) Global custodians/safe-keeping charges are eliminated, saving GDR investors 30 to 60 basis points annually.
 - (iv) GDRs are as liquid as the underlying securities because the two are interchangeable.
 - (v) GDRs are negotiable.
 - (vi) GDRs overcome foreign investment restrictions.

They, however, suffer from certain disadvantages also which may be described as follows.

5.3 Disadvantages of Euro-Issue

- (i) As straight equity, a GDR issue would be immediately earnings dilutive.
- (ii) Pricing of GDRs are expected to be at a discount to the local market price.
- (iii) It is sometimes necessary to use warrants with GDRs to disguise discount, which can increase dilution.
- (iv) GDR issues of Indian Companies have an uneven track record for international investors.

5.4 Structuring of Euro-Issue: The structuring of an Euro-issue is a tough task. The company has to decide whether it has to go for private placement with foreign institutional investors (FIIs) or go for GDR or Euro-convertible bonds.

The dilution of promoters holding as a result of private placement or GDR issues or by way of conversion in Euro-Convertible Bonds (ECB) issue is a matter of paramount concern for the management.

Many companies avoid Euro Convertible issues with a convertible option to be exercised after lock-in-period at a price fixed at the time of closure of the issues. Some companies prefer ECB issues even at a higher coupon rate but without put option clause.

The companies with low equity base and high reserves built up over a long period would like to structure Euro-issues without much dilution of their equity holding strength.

Many permutations and combinations are worked out. Some companies toy with the idea of structuring ECB issues with conversion price ruling at the time of conversion with a discount of 20 per cent to 30 per cent.

Some companies may like to structure Euro-bond issue with warrants enabling investors to convert such warrants into limited equity shares without significantly diluting the existing holdings of the controlling interest. How overseas investors will react to such proposals is, however, yet to be seen.

5.5 Pricing of the Issues: Whether it is an issue of equity (GDR) or convertible Euro-bonds, the company has to carefully consider the pricing of the equity shares. A good company's shares command premium in the stock market. The price of equity shares offered through GDR or Euro bonds is usually determined with reference to the market prices which prevailed during the week and the day prior to the date of issue. If there is a demand for such securities abroad, the price may be at a premium over the market price. Finalisation of price of the Equity shares is done in consultation with the lead manager who knows the pulse of the European investment market.

5.6 Methodology for Euro-Issue: In a foreign currency issue of securities, the number of documents to be prepared by an issuing company is limited as compared to a domestic issue. Generally the issuing company prepares its accounts for the last 3-5 years (which are already audited) in a revised format to conform to the Generally Accepted Accounting Practices (GAAP) prevalent abroad, say in the United Kingdom (U.K.). This is usually, called 'Reformatted Non-Consolidated Financial Statements'. These statements are considered to be very vital which indicates the financial soundness of issuing company.

The success of a Euro-issue also depends upon proper planning and execution of strategic action. It is, therefore, essential to study in depth various areas involved in Euro-issue, such as the investor's market, awareness of the company amongst such investors and correct pricing of the issue. The merchant banker occupies a pivotal place in organising a Euro-issue. As a lead manager, he renders very valuable services to the company in a host of areas like:

- (i) Formulation of marketing strategy
- (ii) Designing issue structure

11.22 Strategic Financial Management

- (iii) Arranging syndication
- (iv) Finalising underwriting arrangements
- (v) Looking after miscellaneous activities
- (vi) Helps in selecting a team of intermediaries such as overseas underwriters, depository and custodians, bankers etc. Each of these intermediaries has its own distinct role to play.
- (vii) Organising due diligence meetings in which the lead manager, senior executives of the company, the auditors and legal advisors review the draft offer document, agreements, consent and comfort letters.
- (viii) Organising team arranges interviews and road shows. After having finalised the offer document, the lead manager helps in arranging interviews of Senior Executives of issuing company with the fund managers and potential investors to provide opportunity of interaction between them. Such meetings help in convincing and sustaining a conducive environment for the success of issue. Wide-spread distribution of pamphlets, brochure and impressive reports about the issuing company's activities and its global issue facilitates negotiations with the potential investors. Such meetings with the investors in common parlance, are known as Road Shows.

6. GDRs vs. Euro-Bonds

Issue of GDR creates equity shares of the issuing company which are kept with a designated bank. GDRs are freely transferable outside India without any reference to the issuing company. The dividends in respect of the share represented by the GDRs are paid in Indian rupees only.

If a GDR holder wishes to exchange his GDR into shares of the company he can surrender his GDR with such request to the designated international depository. On receipt of the documents the depository will instruct the designated bank having the custody of the shares to release the relative shares. Depending on the nature of the request, the bank will arrange to sell the shares through the stock exchange and remit the sale proceeds to him or arrange to get his name entered as a member of the company. Thereafter, the said shares are subject to the usual condition applicable to the company's shares.

7. Cross-Border Leasing

In case of cross-border or international lease, the lessor and the lessee are situated in two different countries. Because the lease transaction takes place between parties of two or more countries, it is called cross-border lease. It involves relationships and tax implications more complex than the domestic lease. When the lease transactions take place between three parties manufacturer/vendor, lessor and lessee in three different countries, this type of cross border leasing is called foreign to foreign lease. The lease may be routed through a third nation known as "convenient country" for tax or equipment registration purposes. Fourth nation may be involved for debt in a particular currency required to give effect to the equipment purchase and lease

transaction. Thus more nations involved in cross border lease would mean more complications in terms of different legal, fiscal, credit and currency requirements and risk involved.

Cross border lease benefits are more or less the same as are available in domestic lease viz. 100% funding off-balance sheets. Financing, matching of expenditure with earnings from the assets, the usual tax benefits on leasing, etc. In addition to these benefits, the following are the more crucial aspects which are required to be looked into: (i) appropriate currency requirements can be met easily to match the specific cash flow needs of the lessee;(ii) funding for long period and at fixed rate which may not be available in the lessee home market may be obtained internationally;(iii) maximum tax benefits in one or more regions could be gained by structuring the lease in a convenient fashion;(iv) tax benefits can be shared by the lessee or lessor accordingly by pricing the lease in the most beneficial way to the parties;(v) choice of assets for cross border lease is different than domestic lease because those assets may find here attractive bargain which are internationally mobile , have adequate residual value and enjoy undisputed title.

Note: Students may also refer to Chapter – 3, Leasing Decisions for further discussion on Cross Border Leasing.

8. International Capital Budgeting

8.1 Complexities Involved: Multinational Capital Budgeting has to take into consideration the different factors and variables which affect a foreign project and are complex in nature than domestic projects. The factors crucial in such a situation are:

- (a) Cash flows from foreign projects have to be converted into the currency of the parent organization.
- (b) Parent cash flows are quite different from project cash flows
- (c) Profits remitted to the parent firm are subject to tax in the home country as well as the host country
- (d) Effect of foreign exchange risk on the parent firm's cash flow
- (e) Changes in rates of inflation causing a shift in the competitive environment and thereby affecting cash flows over a specific time period
- (f) Restrictions imposed on cash flow distribution generated from foreign projects by the host country
- (g) Initial investment in the host country to benefit from the release of blocked funds
- (h) Political risk in the form of changed political events reduce the possibility of expected cash flows
- (i) Concessions/benefits provided by the host country ensures the upsurge in the profitability position of the foreign project
- (j) Estimation of the terminal value in multinational capital budgeting is difficult since the buyers in the parent company have divergent views on acquisition of the project.

8.2 Problems Affecting Foreign Investment Analysis: The various types of problems faced in International Capital Budgeting analysis are as follows:

(1) Multinational companies investing elsewhere are subjected to foreign exchange risk in the sense that currency appreciates/ depreciates over a span of time. To include foreign exchange risk in the cash flow estimates of any project, it is necessary to forecast the inflation rate in the host country during the lifetime of the project. Adjustments for inflation are made in the cash flows depicted in local currency. The cash flows are converted in parent country's currency at the spot exchange rate multiplied by the expected depreciation rate obtained from purchasing power parity.

(2) Due to restrictions imposed on transfer of profits, depreciation charges and technical differences exist between project cash flows and cash flows obtained by the parent organization. Such restriction can be diluted by the application of techniques viz internal transfer prices, overhead payments. Adjustment for blocked funds depends on its opportunity cost, a vital issue in capital budgeting process.

(3) In multinational capital budgeting, after tax cash flows need to be considered for project evaluation. The presence of two tax regimes along with other factors such as remittances to the parent firm in the form of royalties, dividends, management fees etc, tax provisions with held in the host country, presence of tax treaties, tax discrimination pursued by the host country between transfer of realized profits vis-à-vis local re-investment of such profits cause serious impediments to multinational capital budgeting process. MNCs are in a position to reduce overall tax burden through the system of transfer pricing.

For computation of actual after tax cash flows accruing to the parent firm, higher of home/ host country tax rate is used. If the project becomes feasible then it is acceptable under a more favourable tax regime. If infeasible, other tax saving aspects need to be incorporated in order to find out whether the project crosses the hurdle rate.

8.3 Project vis-a-vis Parent Cash Flows: There exists a big difference between the project and parent cash flows due to tax rules, exchange controls. Management and royalty payments are returns to the parent firm. The basis on which a project shall be evaluated depend on one's own cash flows, cash flows accruing to the parent firm or both.

Evaluation of a project on the basis of own cash flows entails that the project should compete favourably with domestic firms and earn a return higher than the local competitors. If not, the shareholders and management of the parent company shall invest in the equity/government bonds of domestic firms. A comparison can not be made since foreign projects replace imports and are not competitors with existing local firms. Project evaluation based on local cash flows avoid currency conversion and eliminates problems associated with fluctuating exchange rate changes.

For evaluation of foreign project from the parent firm's angle, both operating and financial cash flows actually remitted to it form the yardstick for the firm's performance and the basis for distribution of dividends to the shareholders and repayment of debt/interest to lenders. An investment has to be evaluated on basis of net after tax operating cash flows generated by the project. As both types of cash flows (operating and financial) are clubbed together, it is essential to see that financial cash flows are not mixed up with operating cash flows.

8.4 Discount Rate and Adjusting Cash Flows: An important aspect in multinational capital budgeting is to adjust cash flows or the discount rate for the additional risk arising from foreign location of the project. Earlier MNCs adjusted the discount rate upwards for riskier projects as they considered uncertainties in political environment and foreign exchange fluctuations. The MNCs considered adjusting the discount rate to be popular as the rate of return of a project should be in conformity with the degree of risk. It is not proper to combine all risks into a single discount rate. Political risk/uncertainties attached to a project relate to possible adverse effects which might occur in future but cannot be foreseen at present. So adjusting discount rates for political risk penalises early cash flows more than distant cash flows. Also adjusting discount rate to offset exchange risk only when adverse exchange rate movements are expected is not proper since a MNC can gain from favourable currency movements during the life of the project on many occasions. Instead of adjusting discount rate while considering risk it is worthwhile to adjust cash flows. The annual cash flows are discounted at a rate applicable to the project either at that of the host country or parent country. Probability with certainty equivalent method along with decision tree analysis are used for economic and financial forecasting. Cash flows generated by the project and remitted to the parent during each period are adjusted for political risk, exchange rate and other uncertainties by converting them into certainty equivalents.

8.5 Approaches to Calculate NPV of International Project: Broadly two approaches are used to calculate NPV of international project.

8.5.1 Home Currency Approach: This approach involves conversion of foreign currency cash flows in domestic currency flows using expected exchange rate and then discounting these cash flows at required rate of return. The rate to be used in the required converting Foreign Currency cash flow in domestic currency shall be based on Interest Rate Parity.

8.5.2 Foreign Currency Approach: This approach involves conversion of required rate of return or discounting rate for domestic cash flows into discounting rate for foreign currency denominated cash flows and then discount Foreign Currency cash flow by using this converted rate then convert NPV obtained using Spot Rate.

Note: Final answer by above two methods shall almost be equal.
--

Illustration 2

ABC Ltd. is considering a project in Germany, which will involve an initial investment of € 2,20,00,000. The project will have 5 years of life. Current spot exchange rate is ₹ 72 per €. The risk-free rate in Germany is 4% and the same in India is 6%. Cash inflow from the project is as follows:

Year	Cash inflow
1	€ 40,00,000
2	€ 50,00,000
3	€ 60,00,000
4	€ 80,00,000
5	€ 100,00,000

Calculate the NPV of the project using

11.26 Strategic Financial Management

- (a) Home Currency Approach
 (b) Foreign Currency Approach.

Required rate of return on this project is 7%.

Solution

(a) (i) Calculation of Forward Exchange Rates

End of Year	₹	₹/€
1	$₹72.00 \times \left(\frac{(1+0.06)}{(1+0.04)}\right)^1$	73.38
2	$₹72.00 \times \left(\frac{(1+0.06)}{(1+0.04)}\right)^2$	74.80
3	$₹72.00 \times \left(\frac{(1+0.06)}{(1+0.04)}\right)^3$	76.23
4	$₹72.00 \times \left(\frac{(1+0.06)}{(1+0.04)}\right)^4$	77.70
5	$₹72.00 \times \left(\frac{(1+0.06)}{(1+0.04)}\right)^5$	79.19

Calculation of NPV

Year	Cash Flow (Million) €	Expected Rate	Cash flow	PV Factor @ 7%	P.V.
1	4.00	73.38	293.52	0.935	274.44
2	5.00	74.80	374.00	0.873	326.50
3	6.00	76.23	457.38	0.816	373.22
4	8.00	77.70	621.60	0.763	474.28
5	10.00	79.19	791.90	0.713	564.62
Total PV of Cash Inflows					2013.06
Less: Investment	22.00	72.00			1584.00
NPV					429.06

Therefore, Rupee NPV of the project is = ₹ 429.06

and € NPV = ₹ 429.06 / ₹72.00 = € 5.96 Million

$$(b) (1 + 0.06) (1 + \text{Risk Premium}) = (1 + 0.07)$$

$$\text{Or, } 1 + \text{Risk Premium} = 1.07/1.06 = 1.00943$$

Therefore, Risk adjusted dollar rate is = $1.00943 \times 1.04 = 1.0498 - 1 = 0.0498$

Foreign Direct Investment (FDI) and Foreign Institutional Investment (FIIs) 11.27

Calculation of NPV

Year	Cash flow (Million) €	PV Factor at 4.98%	P. V.
1	4.00	0.953	3.812
2	5.00	0.907	4.535
3	6.00	0.864	5.184
4	8.00	0.823	6.584
5	10.00	0.784	<u>7.840</u>
			27.955
		Less: Investment	<u>22.000</u>
		NPV	<u>5.955</u>

Therefore, Rupee NPV of the project is = ₹ (72 x 5.955) Million
= ₹428.76 Million

8.6 Adjusted Present Value Approach (APV) Approach: APV is used in evaluating foreign projects. The APV model is a value additive approach to capital budgeting process i.e. each cash flow is considered individually and discounted at a rate consistent with risk involved in the cash flow.

Different components of the project's cash flow have to be discounted separately.

The APV method uses different discount rates for different segments of the total cash flows depending on the degree of certainty attached with each cash flow. The financial analyst tests the basic viability of the foreign project before accounting for all complexities. If the project is feasible no further evaluation based on accounting for other cash flows is done. If not feasible, an additional evaluation is done taking into consideration the other complexities.

The APV model is represented as follows.

$$-I_0 + \sum_{t=1}^n \frac{X_t}{(1+k^*)^t} + \sum_{t=1}^n \frac{T_t}{(1+i_d)^t} + \sum_{t=1}^n \frac{S_t}{(1+i_d)^t}$$

Where I_0 → Present Value of Investment Outlay

$\frac{X_t}{(1+k^*)^t}$ → Present Value of Operating Cash Flow

$\frac{T_t}{(1+i_d)^t}$ → Present Value of Interest Tax Shields

$\frac{S_t}{(1+i_d)^t}$ → Present Value of Interest Subsidies

11.28 Strategic Financial Management

T_t → Tax Saving in year t due to financial mix adopted

S_t → Before tax value of interests subsidies (on home currency) in year t due to project specific financing

i_d → Before tax cost of dollar debt (home currency)

The initial investment will be net of any 'Blocked Funds' that can be made use of by the parent company for investment in the project. 'Blocked Funds' are balances held in foreign countries that cannot be remitted to the parent due to Exchange Control regulations. These are 'direct blocked funds' Apart from this, it is quite possible that significant costs in the form of local taxes or withholding taxes arise at the time of remittance of the funds to the parent country. Such 'blocked funds' are indirect. If a parent company can release such 'Blocked Funds' in one country for the investment in a overseas project, then such amounts will go to reduce the 'Cost of Investment Outlay'.

The last two terms are discounted at the before tax cost of debt to reflect the relative cash flows due to tax and interest savings.

Scenarios: Following three illustrations are based on three different scenarios:

8.6.1 A foreign company is investing in India

Illustration 3

Perfect Inc., a U.S. based Pharmaceutical Company has received an offer from Aids cure Ltd., a company engaged in manufacturing of drugs to cure Dengue, to set up a manufacturing unit in Baddi (H.P.), India in a joint venture.

As per the Joint Venture agreement, Perfect Inc. will receive 55% share of revenues plus a royalty @ US \$0.01 per bottle. The initial investment will be ₹200 crores for machinery and factory. The scrap value of machinery and factory is estimated at the end of five (5) year to be ₹5 crores. The machinery is depreciable @ 20% on the value net of salvage value using Straight Line Method. An initial working capital to the tune of ₹50 crores shall be required and thereafter ₹5 crores each year.

As per GOI directions, it is estimated that the price per bottle will be ₹7.50 and production will be 24 crores bottles per year. The price in addition to inflation of respective years shall be increased by ₹1 each year. The production cost shall be 40% of the revenues.

The applicable tax rate in India is 30% and 35% in US and there is Double Taxation Avoidance Agreement between India and US. According to the agreement tax credit shall be given in US for the tax paid in India. In both the countries, taxes shall be paid in the following year in which profit have arisen.

The Spot rate of \$ is ₹57. The inflation in India is 6% (expected to decrease by 0.50% every year) and 5% in US.

As per the policy of GOI, only 50% of the share can be remitted in the year in which they are earned and remaining in the following year.

Though WACC of Perfect Inc. is 13% but due to risky nature of the project it expects a return of 15%.

Determine whether Perfect Inc. should invest in the project or not (from subsidiary point of view).

Foreign Direct Investment (FDI) and Foreign Institutional Investment (FIIs) 11.29

Solution

Working Notes:

1. Estimated Exchange Rates (Using PPP Theory)

Year	0	1	2	3	4	5	6
Exchange rate	57	57.54	57.82	57.82	57.54	56.99	56.18

2. Share in sales

Year	1	2	3	4	5
Annual Units in crores	24	24	24	24	24
Price per bottle (₹)	7.50	8.50	9.50	10.50	11.50
Price fluctuating Inflation Rate	6.00%	5.50%	5.00%	4.50%	4.00%
Inflated Price (₹)	7.95	8.97	9.98	10.97	11.96
Inflated Sales Revenue (₹ Crore)	190.80	215.28	239.52	263.28	287.04
Sales share @55%	104.94	118.40	131.74	144.80	157.87

3. Royalty Payment

Year	1	2	3	4	5
Annual Units in crores	24	24	24	24	24
Royalty in \$	0.01	0.01	0.01	0.01	0.01
Total Royalty (\$ Crore)	0.24	0.24	0.24	0.24	0.24
Exchange Rate	57.54	57.82	57.82	57.54	56.99
Total Royalty (₹ Crore)	13.81	13.88	13.88	13.81	13.68

4. Tax Liability

(₹ Crore)

Year	1	2	3	4	5
Sales Share	104.94	118.40	131.74	144.80	157.87
Total Royalty	13.81	13.88	13.88	13.81	13.68
Total Income	118.75	132.28	145.61	158.61	171.55
Less: Expenses					
Production Cost	41.98	47.36	52.69	57.92	63.15
Depreciation	39.00	39.00	39.00	39.00	39.00
PBT	37.77	45.92	53.92	61.69	69.40
Tax on Profit @30%	11.33	13.78	16.18	18.51	20.82
Net Profit	26.44	32.14	37.74	43.18	48.58

11.30 Strategic Financial Management

5. Free Cash Flow

(₹ Crore)

Year	0	1	2	3	4	5	6
Sales Share	0.00	104.94	118.40	131.74	144.80	157.87	0.00
Total Royalty	0.00	13.81	13.88	13.88	13.81	13.68	0.00
Production Cost	0.00	-41.98	-47.36	-52.69	-57.92	-63.15	0.00
Initial Outlay	-200.00	0.00	0.00	0.00	0.00	0.00	0.00
Working Capital	-50.00	-5.00	-5.00	-5.00	-5.00	70.00	0.00
Scrap Value	0.00	0.00	0.00	0.00	0.00	5.00	0.00
Tax on Profit	0.00	0.00	-11.33	-13.78	-16.18	-18.51	-20.82
Free Cash Flow	-250.00	71.77	68.59	74.15	79.51	164.89	-20.82

6. Remittance of Cash Flows

(₹ Crore)

Year	0	1	2	3	4	5	6
Free Cash Flow	-250.00	71.77	68.59	74.15	79.51	164.89	-20.82
50% of Current Year Cash Flow	0.00	35.89	34.29	37.07	39.76	82.45	0.00
Previous year remaining cash flow	0.00	0.00	35.88	34.30	37.08	39.75	82.44
Total Remittance	-250.00	35.88	70.17	71.37	76.84	122.20	61.62

NPV of Project under Appraisal

Year	0	1	2	3	4	5	6
Total Remittance (₹ Crore)	-250.00	35.88	70.17	71.37	76.84	122.20	61.62
Exchange Rate	57.00	57.54	57.82	57.82	57.54	56.99	56.18
Remittance (\$mn)	-43.86	6.24	12.14	12.34	13.35	21.44	10.97
US Tax @35% (\$mn)	0.00	0.00	2.18	4.25	4.32	4.67	7.50
Indian Tax (\$mn)	0.00	0.00	1.96	2.38	2.82	3.25	3.71
Net Tax (\$mn)	0.00	0.00	0.22	1.87	1.51	1.42	3.79
Net Cash Flow (\$mn)	-43.86	6.24	11.92	10.47	11.84	20.02	7.18
PVF	1.000	0.870	0.756	0.658	0.572	0.497	0.432
Present Value (\$mn)	-43.86	5.43	9.01	6.89	6.77	9.95	3.10
Net Present Value (\$mn)	= -2.71						

Decision: Since NPV of the project is negative, Perfect inc. should not invest in the project.

8.6.2 An Indian Company is investing in foreign country by raising fund in the same country.

Illustration 4

Its Entertainment Ltd., an Indian Amusement Company is happy with the success of its Water Park in India. The company wants to repeat its success in Nepal also where it is planning to establish a Grand Water Park with world class amenities. The company is also encouraged by a marketing research report on which it has just spent ₹ 20,00,000 lacs.

The estimated cost of construction would be Nepali Rupee (NPR) 450 crores and it would be completed in one years time. Half of the construction cost will be paid in the beginning and rest at the end of year. In addition, working capital requirement would be NPR 65 crores from the year end one. The after tax realizable value of fixed assets after four years of operation is expected to be NPR 250 crores. Under the Foreign Capital Encouragement Policy of Nepal, company is allowed to claim 20% depreciation allowance per year on reducing balance basis subject to maximum capital limit of NPR 200 crore. The company can raise loan for theme park in Nepal @ 9%.

The water park will have a maximum capacity of 20,000 visitors per day. On an average, it is expected to achieve 70% capacity for first operational four years. The entry ticket is expected to be NPR 220 per person. In addition to entry tickets revenue, the company could earn revenue from sale of food and beverages and fancy gift items. The average sales expected to be NPR 150 per visitor for food and beverages and NPR 50 per visitor for fancy gift items. The sales margin on food and beverages and fancy gift items is 20% and 50% respectively. The park would open for 360 days a year.

The annual staffing cost would be NPR 65 crores per annum. The annual insurance cost would be NPR 5 crores. The other running and maintenance costs are expected to be NPR 25 crores in the first year of operation which is expected to increase NPR 4 crores every year. The company would apportion existing overheads to the tune of NPR 5 crores to the park.

All costs and receipts (excluding construction costs, assets realizable value and other running and maintenance costs) mentioned above are at current prices (i.e. 0 point of time) which are expected to increase by 5% per year.

The current spot rate is NPR 1.60 per ₹. The tax rate in India is 30% and in Nepal it is 20%.

The current WACC of the company is 12%. The average market return is 11% and interest rate on treasury bond is 8%. The company's current equity beta is 0.45. The company's funding ratio for the Water Park would be 55% equity and 45% debt.

Being a tourist Place, the amusement industry in Nepal is competitive and very different from its Indian counterpart. The company has gathered the relevant information about its nearest competitor in Nepal. The competitor's market value of the equity is NPR 1850 crores and the debt is NPR 510 crores and the equity beta is 1.35.

State whether Its Entertainment Ltd. should undertake Water Park project in Nepal or not.

Solution

Working Notes:

1. Calculation of Cost of Funds/ Discount Rate

Competing Company's Information	
Equity Market Value	1850.00
Debt Market Value	510.00
Equity Beta	1.35

11.32 Strategic Financial Management

Assuming debt to be risk free i.e. beta is zero, the beta of competitor is un-g geared as follows:

$$\text{Asset Beta} = \text{Equity Beta} \times \frac{E}{E+D(1-t)} = 1.35 \times \frac{1850}{1850+510(1-0.20)} = 1.106$$

Equity beta for Its Entertainment Ltd. in Nepal

Assets beta in Nepal	1.106
Ratio of funding in Nepal	
Equity	55.00%
Debt	45.00%

$$1.106 = \text{Equity Beta} \times \frac{55}{55 + 45(1-0.30)} = 1.74$$

Cost of Equity as per CAPM

Market Return 11.00%

Risk free return 8.00%

Cost of Equity = Risk free return + β (Market Return - Risk free return)

$$= 8.00\% + 1.74(11.00\% - 8.00\%) = 13.22\%$$

WACC = 13.22% x 0.55 + 9%(1- 0.20) x 0.45 = 10.51%

2. Present Value Factors at the discount rate of 10.51%

Year	0	1	2	3	4	5
PVAF	1.000	0.905	0.819	0.741	0.670	0.607

3. Calculation of Capital Allowances

Year	1	2	3	4
Opening Balance (NPR Crore)	200.00	160.00	128.00	102.40
Less: Depreciation (NPR Crore)	40.00	32.00	25.60	20.48
Closing Balance (NPR Crore)	160.00	128.00	102.40	81.92

Calculation of Present of Free Cash Flow

Year	0	1	2	3	4	5
Expected Annual visitors			5040000	5040000	5040000	5040000
Entry ticket price per visitor (NPR)			242.55	254.68	267.41	280.78
Profit from sale of Food and Beverages per visitor (NPR)			33.08	34.73	36.47	38.29

Foreign Direct Investment (FDI) and Foreign Institutional Investment (FIIs) 11.33

Profit from sale of Fancy Gift Items per visitor (NPR)			27.56	28.94	30.39	31.91
Revenue per visitor (NPR)			303.19	318.35	334.26	350.98
Total Revenue (NPR crores)			152.81	160.45	168.47	176.89
Less:						
Annual Staffing Cost (NPR crores)			71.66	75.25	79.01	82.96
Annual Insurance Costs (NPR crores)			5.51	5.79	6.08	6.38
Other running and maintenance costs (NPR crores)			25.00	29.00	33.00	37.00
Depreciation Allowances (NPR crores)			40.00	32.00	25.60	20.48
Total Expenses (NPR crores)			142.18	142.03	143.69	146.82
PBT (NPR crores)			10.63	18.41	24.78	30.07
Tax on Profit (NPR crores)			2.13	3.68	4.96	6.01
Net Profit (NPR crores)			8.51	14.73	19.83	24.06
Add: Depreciation Allowances (NPR crores)			40	32	25.6	20.48
Park Construction Cost (NPR crores)	-225	-225				
After tax assets realisation value (NPR crores)						250
Working capital (NPR crores)		-65.00	-3.25	-3.41	-3.58	75.25
Net cash Flow (NPR crores)	-225.00	-290.00	45.26	43.32	41.84	369.78
PVF at discount rate	1.00	0.90	0.82	0.74	0.67	0.61
Present Values (NPR crores)	-225.00	-262.42	37.06	32.10	28.06	224.35

Net Present Value (NPR crores) -165.85

8.6.3 An Indian Company is investing in foreign country by raising fund in different country through the mode of Global Depository Receipts (GDRs).

11.34 Strategic Financial Management

Illustration 5

Opus Technologies Ltd., an Indian IT company is planning to make an investment through a wholly owned subsidiary in a software project in China with a shelf life of two years. The inflation in China is estimated as 8 percent. Operating cash flows are received at the year end.

For the project an initial investment of Chinese Yuan (CN¥) 30,00,000 will be in land. The land will be sold after the completion of project at estimated value of CN¥ 35,00,000. The project also requires an office complex at cost of CN¥ 15,00,000 payable at the beginning of project. The complex will be depreciated on straight-line basis over two years to a zero salvage value. This complex is expected to fetch CN¥ 5,00,000 at the end of project.

The company is planning to raise the required funds through GDR issue in Mauritius. Each GDR will have 5 common equity shares of the company as underlying security which are currently trading at ₹200 per share (Face Value = ₹10) in the domestic market. The company has currently paid the dividend of 25% which is expected to grow at 10% p.a. The total issue cost is estimated to be 1 percent of issue size.

The annual sales is expected to be 10,000 units at the rate of CN¥ 500 per unit. The price of unit is expected to rise at the rate of inflation. Variable operating costs are 40 percent of sales. Fixed operating costs will be CN¥ 22,00,000 per year and expected to rise at the rate of inflation.

The tax rate applicable in China for income and capital gain is 25 percent and as per GOI Policy no further tax shall be payable in India. The current spot rate of CN¥ 1 is ₹9.50. The nominal interest rate in India and China is 12% and 10% respectively and the international parity conditions hold

You are required to

- (a) Identify expected future cash flows in China and determine NPV of the project in CN¥.
- (b) Determine whether Opus Technologies should go for the project or not assuming that there neither there is restriction on the transfer of funds from China to India nor any charges/taxes payable on the transfer of funds.

Solution

Working Notes:

1. Calculation of Cost of Capital (GDR)

Current Dividend (D_0)	2.50
Expected Dividend (D_1)	2.75
Net Proceeds	198.00
Growth Rate	10.00%

$$k_e = \frac{2.75}{198} + 0.10 = 0.1139 \text{ i.e. } 11.39\%$$

Foreign Direct Investment (FDI) and Foreign Institutional Investment (FIIs) 11.35

2. Calculation of Expected Exchange Rate as per Interest Rate Parity

YEAR	EXPECTED RATE
1	$= 9.50 \times \frac{(1+0.12)}{(1+0.10)} = 9.67$
2	$= 9.50 \times \frac{(1+0.12)^2}{(1+0.10)^2} = 9.85$

3. Realization on the disposal of Land net of Tax

	CN¥
Sale value at the end of project	3500000.00
Cost of Land	3000000.00
Capital Gain	500000.00
Tax paid	125000.00
Amount realized net of tax	3375000.00

4. Realization on the disposal of Office Complex

	(CN¥)
Sale value at the end of project	500000.00
WDV	0.00
Capital Gain	500000.00
Tax paid	125000.00
Amount realized net of tax (A)	375000.00

5. Computation of Annual Cash Inflows

Year	1	2
Annual Units in crores	10000	10000
Price per bottle (CN¥)	540.00	583.20
Annual Revenue (CN¥)	5400000.00	5832000.00
Less: Expenses		
Variable operating cost (CN¥)	2160000.00	2332800.00
Depreciation (CN¥)	750000.00	750000.00
Fixed Cost per annum (CN¥)	2376000.00	2566080.00
PBT (CN¥)	114000.00	183120.00
Tax on Profit (CN¥)	28500.00	45780.00
Net Profit (CN¥)	85500.00	137340.00
Add: Depreciation (CN¥)	750000.00	750000.00
Cash Flow	835500.00	887340.00

11.36 Strategic Financial Management

(a) Computation of NPV of the project in CN¥

(CN¥)

Year	0	1	2
Initial Investment	-4500000.00		
Annual Cash Inflows		835500.00	887340.00
Realization on the disposal of Land net of Tax			3375000.00
Realization on the disposal of Office Complex			375000.00
Total	-4500000.00	835500.00	4637340.00
PVF @11.39%	1.000	0.898	0.806
PV of Cash Flows	-4500000.00	750279.00	3737696.00
NPV			-12,025

(b) Evaluation of Project from Opus Point of View

(i) Assuming that inflow funds are transferred in the year in which same are generated i.e. first year and second year.

Year	0	1	2
Cash Flows (CN¥)	-4500000.00	835500.00	4637340.00
Exchange Rate (₹/ CN¥)	9.50	9.67	9.85
Cash Flows (₹)	-42750000.00	8079285.00	45677799.00
PVF	1.00	0.893	0.797
	-42750000.00	7214802.00	36405206.00
NPV			870008.00

(ii) Assuming that inflow funds are transferred at the end of the project i.e. second year.

Year	0	2
Cash Flows (CN¥)	-4500000.00	5472840.00
Exchange Rate (Rs./ CN¥)	9.50	9.85
Cash Flows (Rs.)	-42750000.00	53907474.00
PVF	1.00	0.797
	-42750000.00	42964257.00
NPV		214257.00

Though in terms of CN¥ the NPV of the project is negative but in Rs. it has positive NPV due to weakening of Rs. in comparison of CN¥. Thus Opus can accept the project.

9. International Working Capital Management

The management of working capital in an international firm is much more complex as compared to a domestic one. The reasons for such complexity are:

- (1) A multinational firm has a wider option for financing its current assets. A MNC has funds flowing in from different parts of international financial markets. Therefore, it may choose to avail financing either locally or from global financial markets. Such an opportunity does not exist for pure domestic firms.
- (2) Interest and tax rates vary from one country to the other. A Treasurer associated with a multinational firm has to consider the interest/ tax rate differentials while financing current assets. This is not the case for domestic firms.
- (3) A multinational firm is confronted with foreign exchange risk due to the value of inflow/outflow of funds as well as the value of import/export are influenced by exchange rate variations. Restrictions imposed by the home or host country government towards movement of cash and inventory on account of political considerations affect the growth of MNCs. Domestic firm limit their operations within the country and does not face such problems.
- (4) With limited knowledge of the politico-economic conditions prevailing in different host countries, a Manager of a multinational firm often finds it difficult to manage working capital of different units of the firm operating in these countries. The pace of development taking place in the communication system has to some extent eased this problem.
- (5) In countries which operate on full capital convertibility, a MNC can move its funds from one location to another and thus mobilize and 'position' the funds in the most efficient way possible. Such freedom may not be available for MNCs operating in countries that have not subscribed to full capital convertibility (like India).

A study of International Working Capital Management requires knowledge of Multinational Cash Management, International Inventory Management and International Receivables Management.

9.1 Multinational Cash Management: MNCs are very much concerned with effective cash management. International money managers follow the traditional objectives of cash management viz.

- (1) effectively managing and controlling cash resources of the company as well as
- (2) achieving optimum utilization and conservation of funds.

The former objective can be attained by improving cash collections and disbursements and by making an accurate and timely forecast of cash flow pattern. The latter objective can be reached by making money available as and when needed, minimising the cash balance level and increasing the risk adjusted return on funds that is to be invested.

11.38 Strategic Financial Management

International Cash Management requires Multinational firms to adhere to the extant rules and regulations in various countries that they operate in. Apart from these rules and regulations, they would be required to follow the relevant forex market practices and conventions which may not be practiced in their parent countries. A host of factors curtail the area of operations of an international money manager e.g. restrictions on FDI, repatriation of foreign sales proceeds to the home country within a specified time limit and the, problem of blocked funds. Such restrictions hinder the movement of funds across national borders and the manager has to plan beforehand the possibility of such situation arising on a country to country basis. Other complications in the form of multiple tax jurisdictions and currencies and absence of internationally integrated exchange facilities result in shifting of cash from one location to another to overcome these difficulties.

The main objectives of an effective system of international cash management are :

- (1) To minimise currency exposure risk.
- (2) To minimise overall cash requirements of the company as a whole without disturbing smooth operations of the subsidiary or its affiliate.
- (3) To minimise transaction costs.
- (4) To minimise country's political risk.
- (5) To take advantage of economies of scale as well as reap benefits of superior knowledge.

The objectives are conflicting in nature as minimising of transaction costs require cash balance to be kept in the currency in which they are received thereby contradicting both currency and political exposure requirements.

A centralized cash management group is required to monitor and manage parent subsidiary and inter-subsidary cash flows. Centralization needs centralization of information, reports and decision making process relating to cash mobilisation, movement and investment. This system benefits individual subsidiaries which require funds or are exposed to exchange rate risk.

A centralised cash system helps MNCs as follows:

- (a) To maintain minimum cash balance during the year.
- (b) To manage judiciously liquidity requirements of the centre.
- (c) To optimally use various hedging strategies so that MNC's foreign exchange exposure is minimised.
- (d) To aid the centre to generate maximum returns by investing all cash resources optimally.
- (e) To aid the centre to take advantage of multinational netting so that transaction costs and currency exposure are minimised.
- (f) To make maximum utilization of transfer pricing mechanism so that the firm enhances its profitability and growth.

- (g) To exploit currency movement correlations:
 - (i) Payables & receivables in different currencies having positive correlations
 - (ii) Payables of different currencies having negative correlations
 - (iii) Pooling of funds allows for reduced holding – the variance of the total cash flows for the entire group will be smaller than the sum of the individual variances

Consider an MNC with two subsidiaries in different countries. The two subsidiaries periodically send fees and dividends to the parent as well as send excess cash – all of them represent incoming cash to the parent while the cash outflows to the subsidiaries include loans and return on cash invested by them. As subsidiaries purchase supplies from each other they have cash flows between themselves.

International Cash Management has two basic objectives:

1. Optimising Cash Flow movements.
2. Investing excess cash.

As no single strategy of international cash management can help in achieving both these objectives together, its task on such aspects becomes very challenging.

9.1.1 Optimising Cash Flow movements: There are numerous ways of optimising cash inflows:

- (i) Accelerating cash inflows.
- (ii) Managing blocked funds.
- (iii) Minimising tax on cash flow through international transfer pricing.
- (iv) Leading and Lagging strategy.
- (v) Using netting to reduce overall transaction costs by eliminating number of unnecessary conversions and transfer of currencies.

(i) Accelerating Cash Inflows: Faster recovery of cash inflows helps the firm to use them whenever required or to invest them for better returns. Customers all over the world are instructed to send their payments to lockboxes set up at various locations, thereby reducing the time and transaction costs involved in collecting payments. Also, through pre-authorized payment, an organization may be allowed to charge the customer's bank account up to some limit.

(ii) Managing Blocked Funds: The host country may block funds of the subsidiary to be sent to the parent or make sure that earnings generated by the subsidiary be reinvested locally before being remitted to the parent so that jobs are created and unemployment reduced. The subsidiary may be instructed to obtain bank finance locally for the parent firm so that blocked funds may be utilised to pay off bank loans.

The parent company has to assess the potential of future funds blockage in a foreign country. MNCs have to be aware of political risks cropping up due to unexpected blockage of funds

11.40 Strategic Financial Management

and devise ways to benefit their shareholders by using different methods for moving blocked funds through transfer pricing strategies, direct negotiations, leading and lagging and so on.

(iii) Minimising Tax on Cash Flows through Transfer Pricing Mechanism: Large entities having many divisions require goods and services to be transferred frequently from one division to another. The profits of different divisions are determined by the price to be charged by the transferor division to the transferee division. The higher the transfer price, the larger will be the gross profit of the transferor division with respect to the transferee division. The position gets complicated for MNCs due to exchange restrictions, inflation differentials, import duties, tax rate differentials between two nations, quotas imposed by host country, etc.

(iv) Leading and Lagging: This technique is used by subsidiaries for optimizing cash flow movements by adjusting the timing of payments to determine expectations about future currency movements. MNCs accelerate (lead) or delay (lag) the timing of foreign currency payments through adjustment of the credit terms extended by one unit to another. The technique helps to reduce foreign exchange exposure or to increase available working capital. Firms accelerate payments of hard currency payables and delay payments of soft currency payables in order to reduce foreign exchange exposure. A MNC in the USA has subsidiaries all over the world. A subsidiary in India purchases its supplies from another subsidiary in Japan. If the Indian subsidiary expects the rupee to fall against the yen, then it shall be the objective of that firm to accelerate the timing of its payment before the rupee depreciates. Such a strategy is called Leading. On the other hand, if the Indian subsidiary expects the rupee to rise against the yen then it shall be the objective of that firm to delay the timing of its payment before the rupee appreciates. Such a strategy is called Lagging. MNCs should be aware of the government restrictions in such countries before availing of such strategies.

Leading and Lagging involve the movement of cash inflows and outflows, forward and backward in time so as to allow netting and achieve various goals. Regulations governing Leading and Lagging are subject to frequent changes and vary from country to country. So, the global finance manager has to keep himself abreast with such changed regulations before he can successfully employ this technique. The advantages associated with Leading and Lagging are:

1. No formal recognition of indebtedness is required and the credit terms can be altered by increase / decrease of the terms on the accounts.
2. It helps in minimizing foreign exchange exposure and helps in transferring liquidity among affiliates by changing credit terms and is dependent on the opportunity cost of funds to both paying and receiving units.
3. It is an aggressive technique aimed at taking advantage of expected revaluations and devaluations of currency movements.

(v) Netting: It is a technique of optimising cash flow movements with the combined efforts of the subsidiaries thereby reducing administrative and transaction costs resulting from currency conversion. There is a co-ordinated international interchange of materials, finished

Foreign Direct Investment (FDI) and Foreign Institutional Investment (FIIs) 11.41

products and parts among the different units of MNC with many subsidiaries buying /selling from/to each other. Netting helps in minimising the total volume of inter-company fund flow.

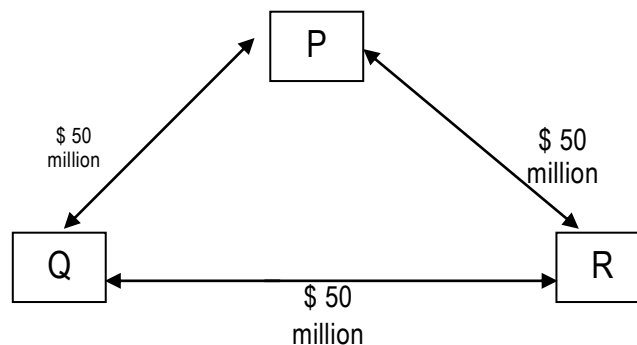
Advantages derived from netting system includes:

- 1) Reduces the number of cross-border transactions between subsidiaries thereby decreasing the overall administrative costs of such cash transfers
- 2) Reduces the need for foreign exchange conversion and hence decreases transaction costs associated with foreign exchange conversion.
- 3) Improves cash flow forecasting since net cash transfers are made at the end of each period
- 4) Gives an accurate report and settles accounts through co-ordinated efforts among all subsidiaries

There are two types of Netting:

- 1) *Bilateral Netting System* – It involves transactions between the parent and a subsidiary or between two subsidiaries. If subsidiary X purchases \$ 20 million worth of goods from subsidiary Y and subsidiary Y in turn buy \$ 30 million worth of goods from subsidiary X, then the combined flows add up to \$ 50 million. But in a bilateral netting system subsidiary X would pay subsidiary Y only \$10 million. Thus bilateral netting reduces the number of foreign exchange transactions and also the costs associated with foreign exchange conversion. A more complex situation arises among the parent firm and several subsidiaries paving the way to multinational netting system.
- 2) *Multilateral Netting System* – Each affiliate nets all its inter affiliate receipts against all its disbursements. It transfers or receives the balance on the position of it being a net receiver or a payer thereby resulting in savings in transfer / exchange costs. For an effective multilateral netting system, these should be a centralised communication system along with disciplined subsidiaries. This type of system calls for the consolidation of information and net cash flow positions for each pair of subsidiaries.

Subsidiary P sells \$ 50 million worth of goods to Subsidiary Q, Subsidiary Q sells \$ 50 million worth of goods to Subsidiary R and Subsidiary R sells \$ 50 million worth of goods to Subsidiary P. Through multilateral netting inter affiliate fund transfers are completely eliminated.



11.42 Strategic Financial Management

The netting system uses a matrix of receivables and payables to determine the net receipt / net payment position of each affiliate at the date of clearing. A US parent company has subsidiaries in France, Germany, UK and Italy. The amounts due to and from the affiliates is converted into a common currency viz. US dollar and entered in the following matrix.

Inter Subsidiary Payments Matrix (US \$ Thousands)

		Paying affiliate				
		France	Germany	UK	Italy	Total
Receiving affiliate	France	---	40	60	100	200
	Germany	60	---	40	80	180
	UK	80	60	---	70	210
	Italy	100	30	60	---	190
	Total	240	130	160	250	780

Without netting, the total payments are \$ 780 Thousands. Through multinational netting these transfers will be reduced to \$ 100 Thousands, a net reduction of 87%. Also currency conversion costs are significantly reduced. The transformed matrix after consolidation and net payments in both directions convert all figures to US dollar equivalents to the below form:

Netting Schedule (US \$ Thousands)

	Receipt	Payment	Net Receipt	Net Payments
France	200	240	---	40
Germany	180	130	50	---
UK	210	160	50	---
Italy	190	250	---	60
			100	100

9.1.2 Investing Excess Cash: Euro Currency market accommodates excess cash in international money market. Euro Dollar deposits offer MNCs higher yield than bank deposits in US. The MNCs use the Euro Currency market for temporary use of funds, purchase of foreign treasury bills / commercial paper. Through better telecommunication system and integration of various money markets in different countries, access to the securities in foreign markets has become easier.

Through a centralised cash management strategy, MNCs pool together excess funds from subsidiaries enabling them to earn higher returns due to the larger deposits lying with them. Sometimes a separate investment account is maintained for all subsidiaries so that short term financing needs of one can be met by the other subsidiary without incurring transaction costs charged by banks for exchanging currencies. Such an approach leads to an excessive transaction costs. The centralised system helps to convert the excess funds pooled together

into a single currency for investments thereby involving considerable transaction cost and a cost benefit analysis should be made to find out whether the benefits reaped are not offset by the transaction costs incurred. A question may arise as to how MNCs will utilise their excess funds once they have used them to meet short term financing needs. This is vital since some currencies may provide a higher interest rate or may appreciate considerably. So deposits made in such currencies will be attractive. Again MNCs may go in for foreign currency deposit which may give an effective yield higher than domestic deposit so as to overcome exchange rate risk. Forecasting of exchange rate fluctuations need to be calculated in this respect so that a comparative study can be effectively made. Lastly an MNC can go for a diversification of its portfolio in different countries having different currencies because of the exchange rate fluctuations taking place and at the same time avoid the possibility of incurring substantial losses that may arise due to sudden currency depreciation.

9.2 International Inventory Management: An international firm possesses normally a bigger stock than EOQ and this process is known as stock piling. The different units of a firm get a large part of their inventory from sister units in different countries. This is possible in a vertical set up. For political disturbance there will be bottlenecks in import. If the currency of the importing country depreciates, imports will be costlier thereby giving rise to stock piling. To take a decision against stock piling the firm has to weigh the cumulative carrying cost vis-à-vis expected increase in the price of input due to changes in exchange rate. If the probability of interruption in supply is very high, the firm may opt for stock piling even if it is not justified on account of higher cost.

Also in case of global firms, lead time is larger on various units as they are located far off in different parts of the globe. Even if they reach the port in time, a lot of customs formalities have to be carried out. Due to these factors, re-order point for international firm's lies much earlier. The final decision depends on the quantity of goods to be imported and how much of them are locally available. Relying on imports varies from unit to unit but it is very much large for a vertical set up.

9.3 International Receivables Management: Credit Sales lead to the emergence of account receivables. There are two types of such sales viz. Inter firm Sales and Intra firm Sales in the global aspect.

In case of Inter firm Sales, the currency in which the transaction should be denominated and the terms of payment need proper attention. With regard to currency denomination, the exporter is interested to denominate the transaction in a strong currency while the importer wants to get it denominated in weak currency. The exporter may be willing to invoice the transaction in the weak currency even for a long period if it has debt in that currency. This is due to sale proceeds being used to retire debts without loss on account of exchange rate changes. With regard to terms of payment, the exporter does not provide a longer period of credit and ventures to get the export proceeds quickly in order to invoice the transaction in a weak currency. If the credit term is liberal the exporter is able to borrow currency from the bank on the basis of bills receivables. Also credit terms may be liberal in cases where

11.44 Strategic Financial Management

competition in the market is keen compelling the exporter to finance a part of the importer's inventory. Such an action from the exporter helps to expand sales in a big way.

In case of Intra firm sales, the focus is on global allocation of firm's resources. Different parts of the same product are produced in different units established in different countries and exported to the assembly units leading to a large size of receivables. The question of quick or delayed payment does not affect the firm as both the seller and the buyer are from the same firm though the one having cash surplus will make early payments while the other with cash crunch will make late payments. This is a case of intra firm allocation of resources where leads and lags explained earlier will be taken recourse to.

12

Foreign Exchange Exposure and Risk Management

Learning Objectives

After going through the chapter student shall be able to understand

- Foreign Exchange Market and its participants
- Nostro, Vostro and Loro Accounts
- Exchange Rate Determination
- Exchange Rate Quotation
- Exchange Rate Forecasting
- Exchange Rate Theories
- Risk Management
- Risk Considerations
- Foreign Exchange Exposure
- Types of Exposures
 - (1) Transaction Exposure
 - (2) Translation Exposure
 - (3) Economic Exposure
- Hedging Currency Risk
 - (A) Internal Techniques
 - (i) Invoicing in Foreign Currency
 - (ii) Leading and Lagging
 - (iii) Netting
 - (iv) Matching
 - (v) Price Variation
 - (vi) Asset and Liability Management

12.2 Strategic Financial Management

- (B) External Techniques
 - (i) Money Market Hedge
 - (ii) Derivatives
 - ❖ Forward Contract including its fate
 - ❖ Future Contract
 - ❖ Option Contract
 - ❖ Swap Contract
- Strategies for Exposure Management
 - (1) Low Risk: Low Reward
 - (2) Low Risk: Reasonable Reward
 - (3) High Risk: Low Reward
 - (4) High Risk: High Reward

1. Introduction

Coupled with globalisation of business, the raising of capital from the international capital markets has assumed significant proportion during the recent years. The volume of finance raised from international capital market is steadily increasing over a period of years, across the national boundaries. Every day new institutions are emerging on the international financial scenario and introducing new derivative financial instruments (products) to cater to the requirements of multinational organisations and the foreign investors.

To accommodate the underlying demands of investors and capital raisers, financial institutions and instruments have also changed dramatically. Financial deregulation, first in the United States and then in Europe and Asia, has prompted increased integration of world financial markets. As a result of the rapidly changing scenario, the finance manager today has to be global in his approach.

In consonance with these remarkable changes, the Government of India has also opened Indian economy to foreign investments and has taken a number of bold and drastic measures to globalise the Indian economy. Various fiscal, trade and industrial policy decisions have been taken and new avenues provided to foreign investors like Foreign Institutional Investors (FII's) and NRI's etc., for investment especially in infrastructural sectors like power and telecommunication etc.

The basic principles of financial management i.e., efficient allocation of resources and raising of funds on most favourable terms and conditions etc. are the same, both for domestic and international enterprises. However the difference lies in the environment in which these multinational organisations function. The environment relates to political risks, Government's tax and investment policies, foreign exchange risks and sources of finance etc. These are some of

the crucial issues which need to be considered in the effective management of international financial transactions and investment decisions.

Under the changing circumstances as outlined above, a finance manager, naturally cannot just be a silent spectator and wait and watch the developments. He has to search for "best price" in a global market place (environment) through various tools and techniques. Sometimes he uses currency and other hedges to optimise the utilisation of financial resources at his command.

However, the problems to be faced by him in the perspective of financial management of the multinational organisations are slightly more complex than those of domestic organisations. While the concepts developed earlier in the previous chapters are also applicable here, the environment in which decisions are made in respect of international financial management is different and it forms the subject matter of this chapter for discussion. In this chapter we shall describe how a finance manager can protect his organisation from the vagaries of international financial transactions.

2. Foreign Exchange Market

The foreign exchange market is the market in which individuals, firms and banks buy and sell foreign currencies or foreign exchange. The purpose of the foreign exchange market is to permit transfers of purchasing power denominated in one currency to another i.e. to trade one currency for another. For example, a Japanese exporter sells automobiles to a U.S. dealer for dollars, and a U.S. manufacturer sells machine tools to Japanese company for yen. Ultimately, however, the U.S. company will be interested in receiving dollars, whereas the Japanese exporter will want yen. Because it would be inconvenient for the individual buyers and sellers of foreign exchange to seek out one another, a foreign exchange market has developed to act as an intermediary.

Transfer of purchasing power is necessary because international trade and capital transactions usually involve parties living in countries with different national currencies. Each party wants to trade and deal in his own currency but since the trade can be invoiced only in a single currency, the parties mutually agree on a currency beforehand. The currency agreed could also be any convenient third country currency such as the US dollar. For, if an Indian exporter sells machinery to a UK importer, the exporter could invoice in pound, rupees or any other convenient currency like the US dollar.

But why do individuals, firms and banks want to exchange one national currency for another? The demand for foreign currencies arises when tourists visit another country and need to exchange their national currency for the currency of the country they are visiting or when a domestic firm wants to import from other nations or when an individual wants to invest abroad and so on. On the other hand, a nation's supply of foreign currencies arises from foreign tourist expenditures in the nation, from export earnings, from receiving foreign investments, and so on. For example, suppose a US firm exporting to the UK is paid in pounds sterling (the UK currency). The US exporter will exchange the pounds for dollars at a commercial bank. The commercial bank will then sell these pounds for dollars to a US resident who is going to visit the UK or to a United States firm that wants to import from the UK and pay in

12.4 Strategic Financial Management

pounds, or to a US investor who wants to invest in the UK and needs the pounds to make the investment.

Thus, a nation's commercial banks operate as clearing houses for the foreign exchange demanded and supplied in the course of foreign transactions by the nation's residents. Hence, four levels of transactor or participants can be identified in foreign exchange markets. At the first level, are tourists, importers, exporters, investors, etc. These are the immediate users and suppliers of foreign currencies. At the next or second level are the commercial banks which act as clearing houses between users and earners of foreign exchange. At the third level are foreign exchange brokers through whom the nation's commercial banks even out their foreign exchange inflows and outflows among themselves. Finally, at the fourth and highest level is the nation's central bank which acts as the lender or buyer of last resort when the nation's total foreign exchange earnings and expenditures are unequal. The central bank then either draws down its foreign exchange reserves or adds to them.

3. Market Participants

The participants in the foreign exchange market can be categorized as follows:

- (i) **Non-bank Entities:** Many multinational companies exchange currencies to meet their import or export commitments or hedge their transactions against fluctuations in exchange rate. Even at the individual level, there is an exchange of currency as per the needs of the individual.
- (ii) **Banks:** Banks also exchange currencies as per the requirements of their clients.
- (iii) **Speculators:** This category includes commercial and investment banks, multinational companies and hedge funds that buy and sell currencies with a view to earn profit due to fluctuations in the exchange rates.
- (iv) **Arbitrageurs:** This category includes those investors who make profit from price differential existing in two markets by simultaneously operating in two different markets.
- (v) **Governments:** The governments participate in the foreign exchange market through the central banks. They constantly monitor the market and help in stabilizing the exchange rates.

4. Nostro, Vostro and Loro Accounts

In interbank transactions, foreign exchange is transferred from one account to another account and from one centre to another centre. Therefore, the banks maintain three types of current accounts in order to facilitate quick transfer of funds in different currencies. These accounts are Nostro, Vostro and Loro accounts meaning "our", "your" and "their". A bank's foreign currency account maintained by the bank in a foreign country and in the home currency of that country is known as Nostro Account or "our account with you". For example, An Indian bank's Swiss franc account with a bank in Switzerland. Vostro account is the local currency account maintained by a foreign bank/branch. It is also called "your account with us". For example, Indian rupee account maintained by a bank in Switzerland with a bank in India. The Loro

account is an account wherein a bank remits funds in foreign currency to another bank for credit to an account of a third bank.

4.1 Exchange Position: It is referred to total of purchases or sale of commitment of a bank to purchase or sale foreign exchange whether actual delivery has taken place or not. In other words, all transactions for which bank has agreed with counter party are entered into exchange position on the date of the contract.

4.2 Cash Position: it is outstanding balance (debit or credit) in bank's nostro account. Since all foreign exchange dealings of bank are routed through nostro account it is credited for all purchases and debited for sale by bank.

It should however be noted that all dealings whether delivery has taken place or not effects the Exchange Position, but Cash Position is affected only when actual delivery has taken place.

Therefore, all transactions effecting Cash position will affect Exchange Position not vice versa.

Illustration 1

Suppose you are a dealer of ABC Bank and on 20.10.2014 you found that balance in your Nostro account with XYZ Bank in London is £65000 and you had overbought £35000. During the day following transaction have taken place:

	£
<i>DD purchased</i>	12500
<i>Purchased a Bill on London</i>	40000
<i>Sold forward TT</i>	30000
<i>Forward purchase contract cancelled</i>	15000
<i>Remitted by TT</i>	37500
<i>Draft on London cancelled</i>	15000

What steps would you take, if you are required to maintain a credit Balance of £7,500 in the Nostro A/c and keep as overbought position on £7,500?

Solution

Exchange Position

Particulars	Purchase £	Sale £
Opening Balance Overbought	35000	—
DD Purchased	12500	—
Purchased a Bill on London	40000	—
Sold forward TT	—	30,000
Forward purchase contract cancelled	—	15000
TT Remittance	—	37500
Draft on London cancelled	15000	—
	102500	82500
Closing Balance Overbought	—	20000
	102500	102500

12.6 Strategic Financial Management

Cash Position (Nostro A/c)

	Credit £	Debit £
Opening balance credit	65000	—
TT Remittance	—	37500
	65000	37500
Closing balance (credit)	—	27500
	65000	65000

To maintain Cash Balance in Nostro Account at £7500 you have to sell £20000 in Spot which will bring Overbought exchange position to Nil. Since bank require Overbought position of £7500 it has to buy the same in forward market.

5. Exchange Rate Determination

An exchange rate is, simply, the price of one nation's currency in terms of another currency, often termed the reference currency. For example, the rupee/dollar exchange rate is just the number of rupee that one dollar will buy. If a dollar will buy 100 rupee, the exchange rate would be expressed as Rs 100/\$ and the rupee would be the reference currency.

Equivalently, the dollar/ rupee exchange rate is the number of dollars one rupee will buy. Continuing the previous example, the exchange rate would be \$0.01/Rs (1/100) and the dollar would now be the reference currency. Exchange rates can be for spot or forward delivery.

The foreign exchange market includes both the spot and forward exchange rates. The spot rate is the rate paid for delivery within two business days after the day the transaction takes place. If the rate is quoted for delivery of foreign currency at some future date, it is called the forward rate. In the forward rate, the exchange rate is established at the time of the contract, though payment and delivery are not required until maturity. Forward rates are usually quoted for fixed periods of 30, 60, 90 or 180 days from the day of the contract.

(a) The Spot Market: The most common way of stating a foreign exchange quotation is in terms of the number of units of foreign currency needed to buy one unit of home currency. Thus, India quotes its exchange rates in terms of the amount of rupees that can be exchanged for one unit of foreign currency.

Illustration 2

If the Indian rupee is the home currency and the foreign currency is the US Dollar then what is the exchange rate between the rupee and the US dollar?

Solution

US\$ 0.0217/₹1 reads "0.0217 US dollar per rupee." This means that for one Indian rupee one can buy 0.0217 US dollar.

In this method, known as the European terms, the rate is quoted in terms of the number of units of the foreign currency for one unit of the domestic currency. This is called an *indirect quote*.

The alternative method, called the American terms, expresses the home currency price of one unit of the foreign currency. This is called a *direct quote*.

This means the exchange rate between the US dollar and rupee can be expressed as:

₹ 46.08/US\$ reads "₹ 46.08 per US dollar."

Hence, a relationship between US dollar and rupee can be expressed in two different ways which have the same meaning:

- One can buy 0.0217 US dollars for one Indian rupee.
- ₹ 46.08 Indian rupees are needed to buy one US dollar.

Illustration 3

The following spot rates are observed in the foreign currency market.

Currency	Foreign currency per U.S.\$
Britain pound	00.62
Netherlands Guilder	1.90
Sweden Kroner	6.40
Switzerland Franc	1.50
Italy Lira	1,300.00
Japan Yen	140.00

On the basis of this information, compute to the nearest second decimal the number of :

- a. British pounds that can be acquired for \$100.
- b. Dollars that 50 Dutch guilders (a European Monetary Union legacy currency) will buy.
- c. Swedish krona that can be acquired for \$40.
- d. Dollars that 200 Swiss francs can buy.
- e. Italian lira (an EMU legacy currency) that can be acquired for \$10.
- f. Dollars that 1,000 Japanese yen will buy.

Solution

	Question	Answer
A	British pounds that can be acquired for \$ 100	$\$100 \times .62 = 62$ pounds
B	\$ that 50 Dutch guilders will buy	$50/1.90 = \$26.32$
C	Swedish Kroner that can be acquired for \$ 40	$\$40 \times 6.40 = 256$ krona
D	Dollars that 200 Swiss francs can buy	$200 / 1.50 = \$133.33$
E	Italian Lira that can be acquired for \$ 10	$\$10 \times 1,300 = 13,000$ lira
F	Dollars that 1000 Japanese yen will buy	$1,000 /140 = \$7.14$

Spot Rates and Forward Rates and Currency Appreciation

Illustration 4

Suppose that 1 French franc could be purchased in the foreign exchange market for 20 US cents on Jan 2, 2012. If the franc appreciated 10 percent the next day against the dollar, how many francs would a dollar buy on Jan 3, 2012?

12.8 Strategic Financial Management

Solution

1 franc = 0.2 US\$. Currency appreciation of francs is 10% Therefore 1 franc = $0.2 \times 1.1 = .22\text{US\$}$

Therefore 1 US\$ = $1/.22 = 4.5455$ French francs

(b) The Forward Market: A forward exchange rate occurs when buyers and sellers of currencies agree to deliver the currency at some future date. They agree to transact a specific amount of currency at a specific rate at a specified future date. The forward exchange rate is set and agreed by the parties and remains fixed for the contract period regardless of the fluctuations in the spot exchange rates in future. The forward exchange transactions can be understood by an example.

A US exporter of computer peripherals might sell computer peripherals to a German importer with immediate delivery but not require payment for 60 days. The German importer has an obligation to pay the required dollars in 60 days, so he may enter into a contract with a trader (typically a local banker) to deliver Euros for dollars in 60 days at a forward rate – the rate today for future delivery.

So, a forward exchange contract implies a forward delivery at specified future date of one currency for a specified amount of another currency. The exchange rate is agreed today, though the actual transactions of buying and selling will take place on the specified date only. The forward rate is not the same as the spot exchange rate that will prevail in future. The actual spot rate that may prevail on the specified date is not known today and only the forward rate for that day is known. The actual spot rate on that day will depend upon the supply and demand forces on that day. The actual spot rate on that day may be lower or higher than the forward rate agreed today.

An Indian exporter of goods to London could enter into a forward contract with his banker to sell pound sterling 90 days from now. This contract can also be described as a contract to purchase Indian Rupees in exchange for delivery of pound sterling. In other words, foreign exchange markets are the only markets where barter happens – i.e., money is delivered in exchange for money!

6. Exchange Rate Quotation

6.1 American Term and European Term: Quotes in *American terms* are the rates quoted in amounts of U.S. dollar per unit of foreign currency. While rates quoted in amounts of foreign currency per U.S. dollar are known as quotes in *European terms*.

For example, U.S. dollar 0.2 per unit of Indian rupee is an American quote while INR 44.92 per unit of U.S. dollar is a European quote.

Most foreign currencies in the world are quoted in terms of the number of units of foreign currency needed to buy one U.S. dollar i.e. the European term.

6.2 Direct and Indirect Quote: As indicated earlier, a currency quotation is the price of a currency in terms of another currency. For example, \$1 = ₹48.00, means that one dollar can be exchanged for ₹48.00. Alternatively; we may pay ₹48.00 to buy one dollar. A foreign

exchange quotation can be either a direct quotation and or an indirect quotation, depending upon the home currency of the person concerned.

A direct quote is the home currency price of one unit foreign currency. Thus, in the aforesaid example, the quote \$1 = ₹48.00 is a direct-quote for an Indian.

An indirect quote is the foreign currency price of one unit of the home currency. The quote Re.1 = \$0.0208 is an indirect quote for an Indian. (\$1/₹ 48.00 = \$0.0208 approximately)

Direct and indirect quotes are reciprocals of each other, which can be mathematically expressed as follows.

Direct quote = 1/indirect quote and vice versa

The following table is an extract from the Bloomberg website showing the Foreign Exchange rates prevailing on 14/09/2012.

	USD	CNY	JPY	HKD	INR	KRW	SGD	EUR
USD		0.1583	0.0128	0.129	0.0184	0.0009	0.8197	1.3089
CNY	6.3162		0.0809	0.8147	0.1161	0.0057	5.177	8.2667
JPY	78.08	12.362		10.072	1.435	0.0701	64	102.17
HKD	7.7526	1.2274	0.0993		0.143	0.0069	6.3546	10.148
INR	54.405	8.613	0.6955	7.005		0.0488	44.505	71.067
KRW	1,114.65	176.5476	14.2965	143.9908	20.4965		914.8582	1,459.05
SGD	1.2202	0.1932	0.0156	0.1574	0.0224	0.0011		1.5961
EUR	0.7642	0.121	0.0098	0.0986	0.014	0.0007	0.6263	

Source : <http://www.bloomberg.com/markets/currencies/cross-rates/>

Students will notice that the rates given in the rows are direct quotes for each of the currencies listed in the first column and the rates given in the columns are the indirect quotes for the currencies listed in the first row. Students can also verify that in every case above.

6.3 Bid, Offer and Spread: A foreign exchange quotes are two-way quotes, expressed as a 'bid' and an offer' (or ask) price. Bid is the price at which the dealer is willing to buy another currency. The offer is the rate at which he is willing to sell another currency. Thus a bid in one currency is simultaneously an offer in another currency. For example, a dealer may quote Indian rupees as ₹48.80 - 48.90 vis-a-vis dollar. That means that he is willing to buy dollars at ₹48.80/\$ (sell rupees and buy dollars), while he will sell dollar at ₹ 48.90/\$ (buy rupees and sell dollars). The difference between the bid and the offer is called the spread. The offer is always higher than the bid as inter-bank dealers make money by buying at the bid and selling at the offer.

$$\% \text{ Spread} = \frac{\text{Bid} - \text{Offer}}{\text{Bid}} \times 100$$

It must be clearly understood that while a dealer buys a currency, he at the same time is selling another currency. When a dealer wants to buy a currency, he/she will ask the other

12.10 Strategic Financial Management

dealer a quote for say a million dollars. The second dealer does not know whether the first dealer is interested in buying or selling one million dollars. The second dealer would then give a two way quote (a bid/offer quote). When the first dealer is happy with the 'ask' price given by the second dealer, he/she would convey "ONE MINE", which means "I am buying one million dollars from you". If the first dealer had actually wanted to sell one million dollars and had asked a quote, and he is happy with the 'bid' price given by the second dealer, he/she would convey "ONE YOURS", which means "I am selling one million dollars to you".

6.4 Cross Rates: It is the exchange rate which is expressed by a pair of currency in which none of the currencies is the official currency of the country in which it is quoted. For example, if the currency exchange rate between a Canadian dollar and a British pound is quoted in Indian newspapers, then this would be called a cross rate since none of the currencies of this pair is of Indian rupee.

Broadly, it can be stated that the exchange rates expressed by any currency pair that does not involve the U.S. dollar are called cross rates. This means that the exchange rate of the currency pair of Canadian dollar and British pound will be called a cross rate irrespective of the country in which it is being quoted as it does not have U.S. dollar as one of the currencies.

Illustration 5

Suppose the exchange rate on Jan 2, 2012 between US dollars and the French franc was FF5.9 = \$1, and on the same day the exchange rate between the dollar and the British pound was 1 Pound = \$1.50. What was the exchange rate between francs and pounds?

Solution

$$1 \text{ Pound} = 1.5 \times 5.9 = 8.85 \text{ FF}$$

6.5 Pips: This is another technical term used in the market. PIP is the Price Interest Point. It is the smallest unit by which a currency quotation can change. E.g., USD/INR quoted to a customer is INR 61.75. The minimum value this rate can change is either INR 61.74 or INR 61.76. In other words, for USD/INR quote, the pip value is 0.01. Pip in foreign currency quotation is similar to the tick size in share quotations. However, in Indian interbank market, USD-INR rate is quoted upto 4 decimal point. Hence minimum value change will be to the tune of 0.0001. Spot EUR/USD is quoted at a bid price of 1.0213 and an ask price of 1.0219. The difference is USD 0.0006 equal to 6 "pips".

6.6 Forward exchange rate Quotation: Forward contract or outright forward contractor merely outright is an agreement between two counterparts to exchange currencies on a future date at a rate fixed in the contract. Ideally, the way in which exchange rate for a forward date [forward exchange rate] is quoted should be the same as that for spot date e.g. if the spot rate is 61.53/54, then the [say six months] forward rate quoting should look like say 61.93/98. However, the market convention is different. Forward rate is not quoted as so and so exchange rate like this but always quoted with spot rate and the forward margin separately. In other words, forward quote is not a foreign exchange rate quotation but is quoted as a difference between spot & forward rates.

The reader or user has to calculate the forward applicable rate by loading the forward margin into the spot rate. Thus e.g. in the above case, the foreign exchange dealer will quote the six-month forward rate as 40/44. He will even presume that the ongoing spot rate is known to the counterparty and may not even mention. Even if he were to mention, he will mention only 53/54, because the 'big figure' [in this case, "61"] is supposed to be known to the counterparty without ambiguity. Since the rate fluctuation is very high, the dealer has no time to quote rates in very detailed English sentences and these conventions have come into practice! The numbers 40 & 44 are arrived at as the differential between 61.93 – 61.53 and 61.98 – 62.54 respectively. These numbers 40 & 44 are called forward margins representing the factor by which the forward rate is different from the spot rate i.e. the margin to be 'loaded' onto the spot rate. Though looks silly, it is worth reiterating that this margin is not the profit margin of the trader!

If the price on a future date is higher, then the currency is said to be at forward premium and then the number represents the forward premium for that forward period. If the price on a future date is lower, then the currency is said to be at forward discount and then the number represents the forward discount for that forward period. In the above example, US dollar is at a premium and the forward premium of USD for six months is 40/44 paise for buying and selling rate respectively in the interbank market. Generally, the margin is quoted in annualized percentage terms. E.g. in this case, extrapolating the premium of six months to twelve months, it can be said that US dollar is likely to have a premium of 80 paise per year [40 paise per six months X 2] which means on a base rate of 61.53, the annualized premium $[=0.8 \times 2 \times 100 / 61.53]$ is 2.60% p.a. In market parlance, forward premium is quoted in percentage terms and this is the basis of calculation. Actually, the forward market in foreign exchange is an interest rate market and is not a foreign exchange market. Because it compares interest rate of one currency with that of another over a period of time. In fact some banks include FX forward traders under their interest rate segment rather than FX segment.

6.7 Forward points determination: The number of 'basis points' from the spot rate to arrive at the forward rate in the above discussions is also referred to as forward points. The points are added to the spot rate when the [foreign] currency is at a premium and deducted from the spot rate when the [foreign] currency is at a discount, to arrive at the forward rate. This is when the rates are quoted in direct method. In case of indirect rate quotations, the process will be exactly the opposite. The forward point may be positive or negative and marked accordingly or specifically mentioned so. The forward points represent the interest rate differential between the two currencies. E.g. if the spot exchange rate is GBP 1 = 1.6000 - 1.6010 USD and if the outright forward points are 5-8, then the outright forward exchange rate quote is GBP 1 = \$ 1.6005 - 1.6018. The number of forward points between the spot and forward is influenced by the present and forward interest rates, the 'length' of the forward and other market factors. Forward point is not a rate but a difference in the rate! Between two currencies, the currency which carries lower interest rate is always at a premium versus the other currency. This is the same as stating that if a currency has a relatively higher 'yield', then it will cost less in the forward market and a currency having lower yield will cost more in

12.12 Strategic Financial Management

the forward market. If there is an aberration to this, arbitrage opportunity arises, which itself will push the prices to equilibrium. If the forward points are mentioned simply as 5/8, then a doubt arises as to whether it is at premium, and hence has to be added or at discount and hence to be deducted. The spot market always has the lowest bid-ask spread and the spread will steadily widen as the duration lengthens.

This is because the uncertainty and the liquidity concerns increase as we go forward in time. If we add 5/8 to the left and right side, the spread will widen and hence fits into the argument.

Hence a quote such as 5/8 or 43/45 with increasing numbers from left to right means the foreign currency is at premium. This looks like a workaround to calculate but the reader can visualize the logic.

Forward points are equivalent to pips in the spot market which we discussed earlier. They are quoted to an accuracy of 1/100th of one point. E.g. if EUR/USD rates for spot and forward are 1.1323 & 1.1328, then the forward point is 5 because one pip or point is worth 0.0001 in EUR/USD.

6.8 Broken period forward rate: Interbank exchange rates are wholesale rates which are applicable to transaction among banks and in the interbank market. They are for large standard amounts with standardized due dates i.e. end of January, end of February and so on. However, in customer transactions, the amounts are not only smaller & for odd amounts, but the due date could be also a non-standardized one. There could be an export bill for euro 12,345.67 getting realized on 10th January or 23rd February and so on. Thus, the forward rate that is available in the interbank market [in the form of forward points for February, for March and so on] cannot be applied as such for customer transactions. The broken period concept becomes relevant in such situations.

On 1st January, if the spot rate for US Dollar is 62 and if the forward margin for two months is 10 paise [premium], then the forward rate can be calculated as ₹ 62.10 per USD and any customer transaction exchange rate can be calculated using this as the base rate. Thus, if the bank wishes to keep a margin of say 3 paise, it will quote a rate of ₹ 62.13 for an importer and quote a rate of ₹ 62.07 for an exporter for an end February realizing bill. However, this logic is valid only for a bill to be realized [for an exporter] or a bill to be paid [for an importer] on 28th February because the underlying forward rate was for two months on 1st January i.e. the date of 28th February. However, in customer transactions, the event [of converting FC into INR or vice versa] does not always happen on the exact standard dates. Thus, if the bill is getting paid or is to be retired on 23rd February, then the forward points are to be calculated for such odd number of days starting from 1st January. It will be presumed [though there is no logical answer, in practice, it turns out to be adequately accurate], that the forward points 'grow' uniformly throughout and arithmetical proportionate for the applicable date is arrived at. E.g. in the above instance, on 1st January, the premium for a customer transaction expected to happen on 23rd February is calculated as $= 10 \times \frac{53}{59} = 8.98$ paise [53 & 59 are broken & full periods] and hence the exchange rate will be 62.0898. As market convention, this will be rounded off to 62.09. The merchant forward rate for a customer transaction expected to

happen on 23rd February will be this margin loaded onto spot rate. Thus, if the margin is 3 paise, the rate for an exporter will be 62.06 & for an importer, the rate will be 62.12. This logic will be applied even while calculating exchange rate for a third currency though the calculation will be a bit lengthier.

6.9 Merchant Rates: It is always interesting to know who 'fixes' the exchange rates as quoted to customers and to realize that nobody fixes but the market decides the exchange rate based on demand and supply and other relevant factors. RBI often clarifies that it does not fix the exchange rates, though in the same breath, RBI also clarifies that it monitors the 'volatility' of Indian rupee exchange rate. In other words, RBI does not control the exchange rates but it controls the volatile movement of INR exchange rate by intervention i.e. by deliberately altering the demand and supply of the foreign currency say USD. It does it by either buying USD from the interbank market or pumping in USD into the market. This wholesale interbank market rate is the basis for banks' exchange rates quoted to customers.

In foreign exchange market, banks consider customers as 'merchants' for historical reasons. It may look ridiculous to call an NRI who has remitted dollars to India as a merchant but exchange rates applied to all types of customers including that for converting inward remittance in USD to INR are called merchant rates as against the rates quoted to each other by banks in the interbank market, which are called interbank rates. Why this term is important here is because there are guidelines issued by FEDAI [Foreign Exchange Dealers Association of India] to banks on these merchant rates as there is customer service element involved in these.

Till 1998, FEDAI prescribed what 'margins' are to be loaded by banks onto the ongoing interbank exchange rate for quoting to customers i.e. to arrive at the merchant rates. This was because, most customer affecting costs like interest rates were then controlled by regulators.

As a part of liberalization, banks got the freedom to quote their own rates. Since then, banks decide themselves what should be the margin depending on the bank's 'position'. The only rule that is still existing in the FEDAI rule book is rule 5A.8 which states that "Settlement of all merchant transactions shall be effected on the principle of rounding off the Rupee amounts to the nearest whole Rupee i.e., without paise". This means if an exporter or an individual has received USD 1234 and if the applicable exchange rate is 61.32, then the amount to be credited to customer's account is ₹ 75669 and not ₹ 75668.88, less charges if any. This rule will be similarly applicable for import or outward remittance transactions also. This rule is more a matter of common sense and does not have any meaningful impact on customer transactions. In fact in some of the banking software, amount is always rounded off.

After the discontinuation of gold standard in 1971 by USA, the foreign exchange market was in turmoil. Initially, RBI had kept sterling as the intervention currency pegging the rupee exchange rate for historical reasons and due to political legacy. Effective 1975, rupee was delinked from sterling and was linked to a basket of currencies. It should be noted that the concept of RBI/FEDAI advising the fixed exchange rate was discontinued long ago. The sterling schedule was abolished from the beginning of 1984. FEDAI issued detailed guidelines

12.14 Strategic Financial Management

to banks on how to calculate exchange rates under the new freedom, the minimum & maximum profit margin and the maximum spread between the buying and selling rates. All these are now redundant now. There were arguments for and against giving freedom to banks for loading margins by banks themselves on the ongoing interbank rate. However the liberalization wave overruled the skeptics.

The International Division of any bank calculates the merchant rates for variety of transactions like import bill, export bill, inward & outward remittance etc. and advises the same in the morning with standard spread loaded to all branches. It is called card rate. For a walk-in customer, for transactions of small value [what is the small it varies with the bank to bank], this is applied.

However, for regular customers and for transactions of high value, always a better rate is sought from the dealing room. Card rates advised in the margin are generally not changed unless there is too much volatility.

7. Exchange Rate Forecasting

The foreign exchange market has changed dramatically over the past few years. The amounts traded each day in the foreign exchange market are now huge. In this increasingly challenging and competitive market, investors and traders need tools to select and analyze the right data from the vast amounts of data available to them to help them make good decisions. Corporates need to do the exchange rate forecasting for taking decisions regarding hedging, short-term financing, short-term investment, capital budgeting, earnings assessments and long-term financing.

7.1 Techniques of Exchange Rate Forecasting: There are numerous methods available for forecasting exchange rates. They can be categorized into four general groups-technical, fundamental, market-based, and mixed.

(a) Technical Forecasting: It involves the use of historical data to predict future values. For example time series models. Speculators may find the models useful for predicting day-to-day movements. However, since the models typically focus on the near future and rarely provide point or range estimates, they are of limited use to MNCs.

(b) Fundamental Forecasting: It is based on the fundamental relationships between economic variables and exchange rates. For example subjective assessments, quantitative measurements based on regression models and sensitivity analyses.

In general, fundamental forecasting is limited by:

- the uncertain timing of the impact of the factors,
- the need to forecast factors that have an immediate impact on exchange rates,
- the omission of factors that are not easily quantifiable, and
- changes in the sensitivity of currency movements to each factor over time.

(c) **Market-Based Forecasting:** It uses market indicators to develop forecasts. The current spot/forward rates are often used, since speculators will ensure that the current rates reflect the market expectation of the future exchange rate.

(d) **Mixed Forecasting:** It refers to the use of a combination of forecasting techniques. The actual forecast is a weighted average of the various forecasts developed.

8. Exchange Rate Theories

There are three theories of exchange rate determination- Interest rate parity, Purchasing power parity and International Fisher effect.

8.1 Interest Rate Parity (IRP): Interest rate parity is a theory which states that ‘the size of the forward premium (or discount) should be equal to the interest rate differential between the two countries of concern’. When interest rate parity exists, covered interest arbitrage (means foreign exchange risk is covered) is not feasible, because any interest rate advantage in the foreign country will be offset by the discount on the forward rate. Thus, the act of covered interest arbitrage would generate a return that is no higher than what would be generated by a domestic investment.

The Covered Interest Rate Parity equation is given by:

$$(1 + r_D) = \frac{F}{S}(1 + r_F)$$

Where,

$(1 + r_D)$ = Amount that an investor would get after a unit period by investing a rupee in the domestic market at r_D rate of interest and $\frac{F}{S}(1 + r_F)$ is the amount that an investor by investing in the foreign market at r_F that the investment of one rupee yield same return in the domestic as well as in the foreign market.

The Uncovered Interest Rate Parity equation is given by:

$$r + r_D = \frac{S_1}{S}(1 + r_F)$$

Where,

S_1 = Expected future spot rate when the receipts denominated in foreign currency is converted into domestic currency.

Thus, it can be said that Covered Interest Arbitrage has an advantage as there is an incentive to invest in the higher-interest currency to the point where the discount of that currency in the forward market is less than the interest differentials. If the discount on the forward market of the currency with the higher interest rate becomes larger than the interest differential, then it pays to invest in the lower-interest currency and take advantage of the excessive forward premium on this currency.

12.16 Strategic Financial Management

Illustration 6

Six-month T-bills have a nominal rate of 7 percent, while default-free Japanese bonds that mature in 6 months have a nominal rate of 5.5 percent. In the spot exchange market, 1 yen equals \$0.009. If interest rate parity holds, what is the 6-month forward exchange rate?

Solution

$$(1.035 / 1.0275) \times .009 = 0.00907$$

8.2 Purchasing Power Parity (PPP): Why is a dollar worth ₹ 48.80, JPY 122.18, etc. at some point in time? One possible answer is that these exchange rates reflect the relative purchasing powers of the currencies, i.e. the basket of goods that can be purchased with a dollar in the US will cost ₹ 48.80 in India and ¥ 122.18 in Japan.

Purchasing Power Parity theory focuses on the 'inflation – exchange rate' relationship. There are two forms of PPP theory:-

The ABSOLUTE FORM, also called the 'Law of One Price' suggests that "prices of similar products of two different countries should be equal when measured in a common currency". If a discrepancy in prices as measured by a common currency exists, the demand should shift so that these prices should converge.

An alternative version of the absolute form that accounts for the possibility of market imperfections such as transportation costs, tariffs, and quotas embed the sectoral constant. It suggests that 'because of these market imperfections, prices of similar products of different countries will not necessarily be the same when measured in a common currency.' However, it states that the rate of change in the prices of products should be somewhat similar when measured in a common currency, as long as the transportation costs and trade barriers are unchanged.

In Equilibrium Form:

$$S = \alpha \frac{P_D}{P_F}$$

Where,

S(₹/\$) = spot rate

P_D = is the price level in India, the domestic market.

P_F = is the price level in the foreign market, the US in this case.

α = Sectoral price and sectoral shares constant.

For example, A cricket bat sells for ₹ 1000 in India. The transportation cost of one bat from Ludhiana to New York costs ₹ 100 and the import duty levied by the US on cricket bats is ₹ 200 per bat. Then the sectoral constant for adjustment would be $1000/1300 = 0.7692$.

It becomes extremely messy if one were to deal with millions of products and millions of constants. One way to overcome this is to use a weighted basket of goods in the two countries represented by an index such as Consumer Price Index. However, even this could break down

because the basket of goods consumed in a country like Finland would vary with the consumption pattern in a country such as Malaysia making the aggregation an extremely complicated exercise.

The RELATIVE FORM of the Purchasing Power Parity tries to overcome the problems of market imperfections and consumption patterns between different countries. A simple explanation of the Relative Purchase Power Parity is given below:

Assume the current exchange rate between INR and USD is ₹ 50 / \$1. The inflation rates are 12% in India and 4% in the US. Therefore, a basket of goods in India, let us say costing now ₹ 50 will cost one year hence ₹ 50 x 1.12 = ₹ 56.00. A similar basket of goods in the US will cost USD 1.04 one year from now. If PPP holds, the exchange rate between USD and INR, one year hence, would be ₹ 56.00 = \$1.04. This means, the exchange rate would be ₹ 53.8462 / \$1, one year from now. This can also be worked backwards to say what should have been the exchange rate one year before, taking into account the inflation rates during last year and the current spot rate.

Expected spot rate = Current Spot Rate x expected difference in inflation rates

$$E(S_1) = S_0 \times \frac{(1 + I_d)}{(1 + I_f)}$$

Where

$E(S_1)$ is the expected Spot rate in time period 1

S_0 is the current spot rate (Direct Quote)

I_d is the inflation in the domestic country (home country)

I_f is the inflation in the foreign country

According to Relative PPP, any differential exchange rate to the one propounded by the theory is the 'real appreciation' or 'real depreciation' of one currency over the other. For example, if the exchange rate between INR and USD one year ago was ₹ 45.00. If the rates of inflation in India and USA during the last one year were 10% and 2% respectively, the spot exchange rate between the two currencies today should be

$$S_0 = 45.00 \times (1+10\%)/(1+2\%) = ₹ 48.53$$

However, if the actual exchange rate today is ₹ 50.00, then the real appreciation of the USD against INR is ₹ 1.47, which is 1.47/45.00 = 3.27%. And this appreciation of the USD against INR is explained by factors other than inflation.

PPP is more closely approximated in the long run than in the short run, and when disturbances are purely monetary in character.

8.3 International Fisher Effect (IFE): International Fisher Effect theory uses interest rate rather than inflation rate differentials to explain why exchange rates change over time, but it is closely related to the Purchasing Power Parity (PPP) theory because interest rates are often highly correlated with inflation rates.

12.18 Strategic Financial Management

According to the International Fisher Effect, 'nominal risk-free interest rates contain a real rate of return and anticipated inflation'. This means if investors of all countries require the same real return, interest rate differentials between countries may be the result of differential in expected inflation.

The IFE theory suggests that foreign currencies with relatively high interest rates will depreciate because the high nominal interest rates reflect expected inflation. The nominal interest rate would also incorporate the default risk of an investment.

The IFE equation can be given by:

$$r_D - P_D = r_F - \Delta P_F$$

or

$$P_D - P_F = \Delta S = r_D - r_F$$

The above equation states that if there are no barriers to capital flows the investment will flow in such a manner that the real rate of return on investment will equalize. In fact, the equation represents the interaction between real sector, monetary sector and foreign exchange market.

If the IFE holds, then a strategy of borrowing in one country and investing the funds in another country should not provide a positive return on average. The reason is that exchange rates should adjust to offset interest rate differentials on the average. As we know that purchasing power has not held over certain periods, and since the International Fisher Effect is based on Purchasing Power Parity (PPP). It does not consistently hold either, because there are factors other than inflation that affect exchange rates, the exchange rates do not adjust in accordance with the inflation differential.

8.4 Comparison of PPP, IRP and IFE Theories: All the above theories relate to the determination of exchange rates. Yet, they differ in their implications.

The theory of IRP focuses on why the forward rate differs from the spot rate and on the degree of difference that should exist. This relates to a specific point in time.

Conversely, PPP theory and IFE theory focuses on how a currency's spot rate will change over time. While PPP theory suggests that the spot rate will change in accordance with inflation differentials, IFE theory suggests that it will change in accordance with interest rate differentials. PPP is nevertheless related to IFE because inflation differentials influence the nominal interest rate differentials between two countries.

<i>Theory</i>	<i>Key Variables</i>	<i>Basis</i>	<i>Summary</i>
Interest Rate Parity (IRP)	Forward rate premium (or discount)	Interest rate differential	The forward rate of one currency will contain a premium (or discount) that is determined by the differential in interest rates between the two countries. As a result, covered interest arbitrage will

			provide a return that is no higher than a domestic return.
Purchasing Power Parity (PPP)	Percentage change in spot exchange rate.	Inflation rate differential.	The spot rate of one currency w.r.t. another will change in reaction to the differential in inflation rates between two countries. Consequently, the purchasing power for consumers when purchasing goods in their own country will be similar to their purchasing power when importing goods from foreign country.
International Fisher Effect (IFE)	Percentage change in spot exchange rate	Interest rate differential	The spot rate of one currency w.r.t. another will change in accordance with the differential in interest rates between the two countries. Consequently, the return on uncovered foreign money market securities will on average be no higher than the return on domestic money market securities from the perspective of investors in the home country.

9. Risk Management

Whether it is investing, driving, or just walking down the street, everyone exposes himself or herself to risk. A person's personality and lifestyle play a big deal on how much risk he can comfortably take on. If an investor invests in stocks and has trouble sleeping at nights because of his investments, then probably he is taking on too much risk. A 'risk' is anything that can lead to results that deviate from the requirements. Risk has two parameters – there must be an uncertainty about the outcome and the 'outcome' has to matter in terms of a 'utility'. According to Tom Gilb, risk can be defined as "An abstract concept expressing the possibility of unwanted outcomes". Deciding what amount of risk an investor can take on while allowing him to get rest at night is his most important decision.

Risk Management is, "any activity which identifies risks, and takes action to remove or control 'negative results' (deviations from the requirements)." Effective risk management strategies have become increasingly necessary due to the dynamic nature of the business environment. Globalization is resulting in new markets, new competitors, and new products. Technological

12.20 Strategic Financial Management

advances are dramatically accelerating the pace of business and the volatility of financial markets. A new relationship between the public and private sectors is contributing to restructured markets and greater deregulation.

Volatility in financial markets was a natural outcome of changes in the flow of funds worldwide following the first oil crisis in the 1970s, the collapse of the fixed foreign exchange rate system, monetarist practices adopted by many central banks, the advancement of communications and technology, and the acceptance of deregulation of financial systems around the world during the 1980s.

Unpredictable changes in interest rates, yield curve structures, exchange rates, and commodity prices, exacerbated by the explosion in international expansion, have made the financial environment riskier today than it ever was in the past. For this reason, boards of directors, shareholders, and executive and tactical management need to be seriously concerned that corporate risk management activities be adequately assessed, prioritized, driven by strategy, controlled, and reported.

Organizations around the globe are therefore overwhelmingly focused on the most fundamental of financial principles: risks = returns. Executives are undertaking major initiatives to manage the risk side of this equation, and, in doing so, are examining global treasury alternatives and employing comprehensive and integrated risk management strategies.

Each organization faces a unique set of parameters with respect to, for example, industry sector, product mix, organizational goals, business culture, and risk tolerances. Consequently, an organization must tailor its risk management framework to meet its particular needs.

Organizations are now concerned with the problems faced by any firm whose performance is affected by the international environment. Indeed, even companies that operate only domestically but compete with firms producing abroad and selling in their local market are affected by international developments. For example, Indian clothing or appliance manufacturers with no overseas sales will find Indian sales and profit margins affected by exchange rates, which influence the prices of imported clothing and appliances. Similarly, bond investors holding their own government's bonds, denominated in their own currency, and spending all their money at home are affected by changes in exchange rates if exchange rates prompt changes in interest rates. Specifically, if governments increase interest rates to defend their currencies when they fall in value on the foreign exchange markets, holders of domestic bonds will find their assets falling in value along with their currencies: bond prices fall when interest rates increase. It is difficult to think of any firm or individual that is not affected in some way or other by the international environment. Jobs, bond and stock prices, food prices, government revenues and other important economic variables are all tied to exchange rates and other developments in the global financial environment.

10. Risk Considerations

A multinational organization operates in more than one country. This implies that it functions in different environments. However, the degree of risk is different in different countries. It has

been observed that international diversification is often more effective than domestic diversification in reducing company's risk in relation to its expected return because the economic cycles of different countries do not tend to be completely synchronized. For example, if a company is in a particular line of business, say power and telecom facilities, invests in another unit in the same country, both the existing and the new units are subjected to the same environmental risks and the return from the new plant is likely to be highly correlated with return from existing plant. This implies that there is no change in the environmental risks and perceptions in the same country both for existing and new units. However, had the management decided to invest the same money in the similar business but in a different country, there would have been change in environmental risk as well as reward perception since both the units now function in different environments. This mechanism probably reduces the risk facing the business and improves chances of rewards.

The political instability and unfavourable Government can seriously endanger the very existence and functioning of the multi-national organizations. It is therefore advisable that before making investment abroad, the organisation should realistically assess the political instability and risk of that country in which investment is proposed to be made. In other words, the company will have to forecast the political instability of the country, which is possible by assessing the degree of stability of the existing government, its attitude towards foreign investment, incentives offered and the quickness in processing foreign investment proposals. If the assessment reveals that political risks is high, the company may decide not to invest even if very high returns are expected to be made and vice-versa.

There are several types of risk that an investor should consider and pay careful attention to. They are:

10.1 Financial Risk – It is the potential loss or danger due to the uncertainty in movement of foreign exchange rates, interest rates, credit quality, liquidity position, investment price, commodity price, or equity price, as well as the unpredictability of sales price, growth, and financing capabilities. Balance sheet and cash flow hedges as well as derivatives tools mitigate financial risks by reducing uncertainty faced by firms.

However, these strategies and instruments themselves are manifestations of the different types of financial uncertainty in that further risks arise from their use.

10.2 Business Risk – On a micro scale, business risk involves the variability in earnings due to variation in the cash inflows and outflows of capital investment projects undertaken. This risk, also known as investment risk, may materialize because of forecasting errors made in market acceptance of products, future technological changes, and changes in costs related to projects.

On an aggregated basis variability in earnings may derive from the degree of efficient diversification that the firm has achieved in its operations and its overall portfolio of assets. The firm can reduce this risk, also referred to as portfolio risk, by seeking out capital projects and merger candidates that have a low or negative correlation with its present operations.

12.22 Strategic Financial Management

10.3 Credit Risk (i.e, default risk) – Government Securities (G-Secs) and Treasury bills have sovereign risk associated with them – i.e. read zero credit risk, whereas securities issued by Corporates suffer from the risk of non-payment or delayed payment of interest and principal as and when they become due.

10.4 Interest Rate Risk – Interest rate prevailing in a economy is influenced, inter alia, by the demand for and supply of money and the inflation rates. These parameters keep changing continuously and hence interest rates also fluctuate. An investor's investment in a financial security suffers from the fluctuating interest rates as price of the security and yield expectations are inversely related. Therefore, when interest rates rise, the value of a portfolio reduces.

10.5 Liquidity Risk – This is the possibility for an investor to experience losses due to the inability to sell or convert assets into cash immediately or in instances where conversion to cash is possible but at a loss. These may be caused by different reasons such as trading in securities with small or few outstanding issues, absence of buyers, limited buy/sell activity or underdeveloped market. Even government securities which are the most liquid of fixed income securities may be subjected to liquidity risk particularly if a sizeable volume is involved. In the equity markets, the liquidity risk is captured by 'impact cost' percentage.

10.6 Market/Price Risk - This is the possibility for an investor to experience losses due to changes in market prices of securities. It is the exposure to the uncertain market value of a portfolio due to price fluctuations.

10.7 Reinvestment Risk – This is the risk associated with the possibility of having lower returns or earnings when maturing funds or the interest earnings of funds are reinvested. Investors who redeem and realize their gains run the risk of reinvesting their funds in an alternative investment outlet with lower yields. Similarly, the investor is faced with the risk of not being able to find good or better alternative investment outlets as some of the securities in the fund matures.

10.8 Country Risk – This is the possibility for an investor to experience losses arising from investments in securities issued by/in foreign countries due to changes in forex rates (transaction, translation and economic exposures) or due to expropriation actions by the host governments.

All businesses trading overseas and increasingly in domestic markets will have some exposure to exchange rate movements either directly or indirectly. Whilst exposure to exchange rate movements may be an inevitable part of everyday activity, the risk arising from such exposure can be controlled.

EXHIBIT 8.11

International Country Risk Guide Methodology					
Political		Financial		Economic	
Risk Factor	Weight (%)	Risk Factor	Weight (%)	Risk Factor	Weight (%)
Economic expectations versus reality	6	Loan default or unfavorable loan restructuring	5	Inflation	5
Economic planning failures	6	Delayed payment of suppliers' credit	5	Debt service as percentage of exports	5
Political leadership	6	Repudiation of contracts	5	International liquidity ratios	3
External conflict	5	Losses from exchange controls	5	Foreign trade collection experience	3
Government corruption	3	Expropriation of private investments	5	Current account as percentage of GNP	6
Military in politics	3			Parallel foreign exchange rate market indicators	3
Organized religion in politics	3				
Law and order tradition	3				
Racial and national tensions	3				
Political terrorism	3				
Civil war	3				
Political party development	3				
Quality of bureaucracy	3				
Total Political	50	Total Financial	25	Total Economic	25

11. Foreign Exchange Exposure

“An Exposure can be defined as a Contracted, Projected or Contingent Cash Flow whose magnitude is not certain at the moment. The magnitude depends on the value of variables such as Foreign Exchange rates and Interest rates.”

In other words, exposure refers to those parts of a company's business that would be affected if exchange rate changes. Foreign exchange exposures arise from many different activities.

For example, travellers going to visit another country have the risk that if that country's currency appreciates against their own their trip will be more expensive.

An exporter who sells his product in foreign currency has the risk that if the value of that foreign currency falls then the revenues in the exporter's home currency will be lower.

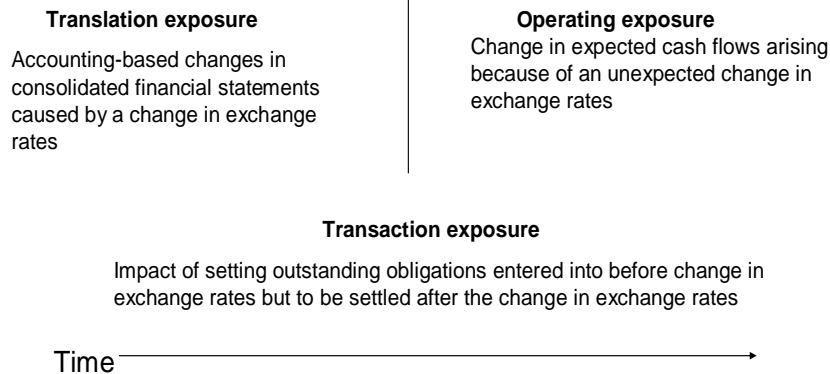
An importer who buys goods priced in foreign currency has the risk that the foreign currency will appreciate thereby making the local currency cost greater than expected.

Fund Managers and companies who own foreign assets are exposed to fall in the currencies where they own the assets. This is because if they were to sell those assets their exchange rate would have a negative effect on the home currency value.

Other foreign exchange exposures are less obvious and relate to the exporting and importing in ones local currency but where exchange rate movements are affecting the negotiated price.

Types of Exposures: The foreign exchange exposure may be classified under three broad categories:

Moment in time when exchange rate changes



11.1 Transaction Exposure: It measures the effect of an exchange rate change on outstanding obligations that existed before exchange rates changed but were settled after the exchange rate changes. Thus, it deals with cash flows that result from existing contractual obligations.

Example: If an Indian exporter has a receivable of \$100,000 due in six months hence and if the dollar depreciates relative to the rupee a cash loss occurs. Conversely, if the dollar appreciates relative to the rupee, a cash gain occurs.

The above example illustrates that whenever a firm has foreign currency denominated receivables or payables, it is subject to transaction exposure and their settlements will affect the firm's cash flow position.

11.2 Translation Exposure: Also known as accounting exposure, it refers to gains or losses caused by the translation of foreign currency assets and liabilities into the currency of the parent company for consolidation purposes.

Translation exposure, also called as accounting exposure, is the potential for accounting derived changes in owner's equity to occur because of the need to "translate" foreign currency financial statements of foreign subsidiaries into a single reporting currency to prepare worldwide consolidated financial statements.

Translation exposures arise due to the need to "translate" foreign currency assets and liabilities into the home currency for the purpose of finalizing the accounts for any given period. A typical example of translation exposure is the treatment of foreign currency loans.

Consider that a company has taken a medium-term loan to finance the import of capital goods worth dollars 1 million. When the import materialized, the exchange rate was, say, USD/INRR-55. The imported fixed asset was, therefore, capitalized in the books of the company at ₹ 550 lacs through the following accounting entry:

Debit fixed assets ₹ 550 lacs

Credit dollar loan ₹ 550 lacs

In the ordinary course, and assuming no change in the exchange rate, the company would have provided depreciation on the asset valued at ₹ 550 lacs, for finalizing its account for the year in which the asset was purchased.

However, what happens if at the time of finalization of the accounts the exchange rate has moved to say USD/INR-58. Now the dollar loan will have to be “translated” at ₹ 58, involving a “translation loss” of a ₹ 30 lacs. It shall have to be capitalized by increasing the book value of the asset, thus making the figure ₹ 380 lacs and consequently higher depreciation will have to be provided, thus reducing the net profit.

It will be readily seen that both transaction and translation exposures affect the bottom line of a company. The effect could be positive as well if the movement is favourable – i.e., in the cited examples, in case the USD would have appreciated in case of Transaction Exposure example, or the USD would have depreciated in case of Translation Exposure, for example, against the rupee.

An important observation is that the translation exposure, of course, becomes a transaction exposure at some stage: the dollar loan has to be repaid by undertaking the transaction of purchasing dollars.

11.3 Economic Exposure: It refers to the extent to which the economic value of a company can decline due to changes in exchange rate. It is the overall impact of exchange rate changes on the value of the firm. The essence of economic exposure is that exchange rate changes significantly alter the cost of a firm’s inputs and the prices of its outputs and thereby influence its competitive position substantially.

Effects of Local Currency Fluctuations on Company’s Economic Exposure (Cash inflow)

<i>Variables influencing the inflow of cash in Local currency</i>	<i>Revaluation impact</i>	<i>Devaluation impact</i>
Local sale, relative to foreign competition in local currency	Decrease	Increase
Company’s export in local currency	Decrease	Increase
Company’s export in foreign currency	Decrease	Increase
Interest payments from foreign investments	Decrease	Increase

Effects of Local Currency Fluctuations on Company’s Economic Exposure (Cash outflow)

<i>Variables influencing the outflow of cash in local currency</i>	<i>Revaluation impact</i>	<i>Devaluation impact</i>
Company’s import of material the same denoted in local currency	Remain the same	Remain the same

12.26 Strategic Financial Management

Company's import of material denoted in foreign currency	Decrease	Increase
Interest on foreign debt	Decrease	Increase

12. Hedging Currency Risk

There are a range of hedging instruments that can be used to reduce risk. Broadly these techniques can be divided into

(A) Internal Techniques: These techniques explicitly do not involve transaction costs and can be used to completely or partially offset the exposure. These techniques can be further classified as follows:

(i) Invoicing in Domestic Currency: Companies engaged in exporting and importing, whether of goods or services, are concerned with decisions relating to the currency in which goods and services are invoiced. Trading in a foreign currency gives rise to transaction exposure. Although trading purely in a company's home currency has the advantage of simplicity, it fails to take account of the fact that the currency in which goods are invoiced has become an essential aspect of the overall marketing package given to the customer. Sellers will usually wish to sell in their own currency or the currency in which they incur cost. This avoids foreign exchange exposure. But buyers' preferences may be for other currencies. Many markets, such as oil or aluminum, in effect require that sales be made in the same currency as that quoted by major competitors, which may not be the seller's own currency. In a buyer's market, sellers tend increasingly to invoice in the buyer's ideal currency. The closer the seller can approximate the buyer's aims, the greater chance he or she has to make the sale.

Should the seller elect to invoice in foreign currency, perhaps because the prospective customer prefers it that way or because sellers tend to follow market leader, then the seller should choose only a major currency in which there is an active forward market for maturities at least as long as the payment period. Currencies, which are of limited convertibility, chronically weak, or with only a limited forward market, should not be considered.

The seller's ideal currency is either his own, or one which is stable relative to it. But often the seller is forced to choose the market leader's currency. Whatever the chosen currency, it should certainly be one with a deep forward market. For the buyer, the ideal currency is usually its own or one that is stable relative to it, or it may be a currency of which the purchaser has reserves.

(ii) Leading and Lagging: Leading and Lagging refer to adjustments in the times of payments in foreign currencies. Leading is the payment before due date while lagging is delaying payment past the due date. These techniques are aimed at taking advantage of expected devaluation and/or revaluation of relevant currencies. Lead and lag payments are of special importance in the event that forward contracts remain inconclusive. For example, Subsidiary b in B country owes money to subsidiary a in country A with payment due in three months' time, and with the debt denominated in US dollar. On the other side, country B's currency is expected to devalue within three months against US dollar, vis-à-vis country A's currency.

Under these circumstances, if company b leads -pays early - it will have to part with less of country B's currency to buy US dollars to make payment to company A. Therefore, lead is attractive for the company. When we take reverse the example-revaluation expectation- it could be attractive for lagging.

(iii) Netting: Netting involves associated companies, which trade with each other. The technique is simple. Group companies merely settle inter affiliate indebtedness for the net amount owing. Gross intra-group trade, receivables and payables are netted out. The simplest scheme is known as bilateral netting and involves pairs of companies. Each pair of associates nets out their own individual positions with each other and cash flows are reduced by the lower of each company's purchases from or sales to its netting partner. Bilateral netting involves no attempt to bring in the net positions of other group companies.

Netting basically reduces the number of inter company payments and receipts which pass over the foreign exchanges. Fairly straightforward to operate, the main practical problem in bilateral netting is usually the decision about which currency to use for settlement.

Netting reduces banking costs and increases central control of inter company settlements. The reduced number and amount of payments yield savings in terms of buy/sell spreads in the spot and forward markets and reduced bank charges.

(iv) Matching: Although netting and matching are terms, which are frequently used interchangeably, there are distinctions. Netting is a term applied to potential flows within a group of companies whereas matching can be applied to both intra-group and to third-party balancing.

Matching is a mechanism whereby a company matches its foreign currency inflows with its foreign currency outflows in respect of amount and approximate timing. Receipts in a particular currency are used to make payments in that currency thereby reducing the need for a group of companies to go through the foreign exchange markets to the unmatched portion of foreign currency cash flows.

The prerequisite for a matching operation is a two-way cash flow in the same foreign currency within a group of companies; this gives rise to a potential for natural matching. This should be distinguished from parallel matching, in which the matching is achieved with receipt and payment in different currencies but these currencies are expected to move closely together, near enough in parallel.

Both Netting and Matching presuppose that there are enabling Exchange Control regulations. For example, an MNC subsidiary in India cannot net its receivable(s) and payable(s) from/to its associated entities. Receivables have to be received separately and payables have to be paid separately.

(v) Price Variation: Price variation involves increasing selling prices to counter the adverse effects of exchange rate change. This tactic raises the question as to why the company has not already raised prices if it is able to do so. In some countries, price increases are the only legally available tactic of exposure management.

12.28 Strategic Financial Management

Let us now concentrate to price variation on inter company trade. Transfer pricing is the term used to refer to the pricing of goods and services, which change hands within a group of companies. As an exposure management technique, transfer price variation refers to the arbitrary pricing of inter company sales of goods and services at a higher or lower price than the fair price, arm's length price. This fair price will be the market price if there is an existing market or, if there is not, the price which would be charged to a third party customer. Taxation authorities, customs and excise departments and exchange control regulations in most countries require that the arm's length pricing be used.

(vi) Asset and Liability Management: This technique can be used to manage balance sheet, income statement or cash flow exposures. Concentration on cash flow exposure makes economic sense but emphasis on pure translation exposure is misplaced. Hence our focus here is on asset liability management as a cash flow exposure management technique.

In essence, asset and liability management can involve aggressive or defensive postures. In the aggressive attitude, the firm simply increases exposed cash inflows denominated in currencies expected to be strong or increases exposed cash outflows denominated in weak currencies. By contrast, the defensive approach involves matching cash inflows and outflows according to their currency of denomination, irrespective of whether they are in strong or weak currencies.

(B) External Techniques: Under this category range of various financial products are used which can be categorized as follows:

(i) Money Market Hedging: At its simplest, a money market hedge is an agreement to exchange a certain amount of one currency for a fixed amount of another currency, at a particular date. For example, suppose a business owner in India expects to receive 1 Million USD in six months. This Owner could create an agreement now (today) to exchange 1 Million USD for INR at roughly the current exchange rate. Thus, if the USD dropped in value by the time the business owner got the payment, he would still be able to exchange the payment for the original quantity of U.S. dollars specified.

Advantages and Disadvantages of Money Market Hedge: Following are the advantages and disadvantages of this technique of hedging.

Advantages

- (a) Fixes the future rate, thus eliminating downside risk exposure
- (b) Flexibility with regard to the amount to be covered
- (c) Money market hedges may be feasible as a way of hedging for currencies where forward contracts are not available.

Disadvantages include:

- (a) More complicated to organise than a forward contract
- (b) Fixes the future rate - no opportunity to benefit from favourable movements in exchange rates.

(ii) Derivative Instruments: A derivatives transaction is a bilateral contract or payment exchange agreement whose value depends on - derives from - the value of an underlying asset, reference rate or index. Today, derivatives transactions cover a broad range of underlying - interest rates, exchange rates, commodities, equities and other indices.

In addition to privately negotiated, global transactions, derivatives also include standardized futures and options on futures that are actively traded on organized exchanges and securities such as call warrants.

The term derivative is also used to refer to a wide variety of other instruments. These have payoff characteristics, which reflect the fact that they include derivatives products as part of their make-up.

Transaction risk can also be hedged using a range of financial derivatives products which include: Forwards, futures, options, swaps, etc. These instruments are discussed in detailed manner in following pages.

13. Forward Contracts

The simplest form of derivatives is the forward contract. It obliges one party to buy, and the other to sell, a specified quantity of a nominated underlying financial instrument at a specific price, on a specified date in the future. There are markets for a multitude of underlying. Among these are the traditional agricultural or physical commodities, currencies (foreign exchange forwards) and interest rates (forward rate agreements - FRAs). The volume of trade in forward contracts is massive.

13.1 Forward Rate – Premium and Discount: The change in value in a forward contract is broadly equal to the change in value in the underlying. Forwards differ from options in that options carry a different payoff profile. Forward contracts are unique to every trade. They are customized to meet the specific requirements of each end-user. The characteristics of each transaction include the particular business, financial or risk-management targets of the counterparties. Forwards are not standardized. The terms in relation to contract size, delivery grade, location, delivery date and credit period are always negotiated.

In a forward contract, the buyer of the contract draws its value at maturity from its delivery terms or a cash settlement. On maturity, if the price of the underlying is higher than the contract price the buyer makes a profit. If the price is lower, the buyer suffers a loss. The gain to the buyer is a loss to the seller.

- ❖ *Forwards Rates:* The forward rate is different from the spot rate. Depending upon whether the forward rate is greater than the spot rate, given the currency in consideration, the forward may either be at a 'discount' or at a 'premium'. Forward premiums and discounts are usually expressed as an annual percentages of the difference between the spot and the forward rates.
- ❖ *Premium:* When a currency is costlier in forward or say, for a future value date, it is said to be at a premium. In the case of direct method of quotation, the premium is added to both the selling and buying rates.

12.30 Strategic Financial Management

- ❖ *Discount:* If the currency is cheaper in forward or for a future value date, it is said to be at a discount. In case of direct quotation the discount is deducted from both the selling and buying rate. The following example explains how to calculate Premium / Discount both under Indirect/Direct quotes.

To calculate the Premium or Discount of a currency vis-à-vis another, we need to find out how much each unit of the first currency can buy units of the second currency. For instance, if the Spot rate between INR and USD is ₹ 55 to a dollar and the six months forward rate is ₹ 60 to a dollar, it is clear the USD is strengthening against the Rupee and hence is at a premium. Which also means that Rupee is at discount.

The premium of USD against INR is ₹ 5 for six months in absolute terms. However, forward premium is always expressed as an annual percentage. Therefore, this premium is calculated as

$$\begin{aligned} & [(\text{Forward Rate} - \text{Spot rate}) / (\text{Spot rate})] \times (12/6) \\ & = (60 - 55) / (55) \times 12/6 = 18.18\% \end{aligned}$$

Rupee is at discount and to calculate the discount, we need to find out how many dollars each Rupee can buy today and six months from now. Therefore, the Spot rate of USD in terms of INR today is USD 1/55 = \$ 0.01818 and six months from now is USD 1/60 = \$ 0.01667. The discount is calculated as:

$$\begin{aligned} & [(\text{Forward Rate} - \text{Spot rate}) / (\text{Spot rate})] \times (12/6) \\ & = (0.01667 - 0.01818) / 0.01818 \times 12/6 \\ & = - 0.00151 / 0.01818 \times 12/6 = - 16.61\% \end{aligned}$$

The minus sign implies that the Rupee is at discount.

Another important point to be noted in the above example, is that the forward premiums do not equal forward discount always. In the aforesaid example, for instance, the rupee is trading at a discount of 16.67% while the dollar is trading at a premium of 18.18%.

13.2 Fate of Forward Contracts: Whenever any forward contract is entered, normally it meets any of the following three fates.

- (A) *Delivery under the Contract*
- (B) *Cancellation of the Contract*
- (C) *Extension of the Contract*

Further above of fates of forward contract can further classified into following sub-categories.

- (A) Delivery under the Contract
 - (i) Delivery on Due Date
 - (ii) Early Delivery

- (iii) Late Delivery
- (B) Cancellation of the Contract
 - (i) Cancellation on Due Date
 - (ii) Early Cancellation
 - (iii) Late Cancellation
- (C) Extension of the Contract
 - (i) Extension on Due Date
 - (ii) Early Extension
 - (iii) Late Extension

Let us discuss each of above executions one by one.

Delivery on Due Date

This situation does not pose any problem as rate applied for the transaction would be rate originally agreed upon. Exchange shall take place at this rate irrespective of the spot rate prevailing.

Illustration 7

On 1st June 2015 the bank enters into a forward contract for 2 months for selling US\$ 1,00,000 at ₹ 65.5000. On 1st July 2015 the spot rate was ₹ 65.7500/65.2500. Calculate the amount to be debited in the customer's account.

Solution

The bank will apply rate originally agreed upon i.e. ₹ 65.5000 and will debit the account of the customer with ₹ 65,50,000.

Early Delivery

The bank may accept the request of customer of delivery at the before due date of forward contract provided the customer is ready to bear the loss if any that may accrue to the bank as a result of this. In addition to some prescribed fixed charges bank may also charge additional charges comprising of:

- (a) *Swap Difference*: This difference can be loss/ gain to the bank. This arises on account of offsetting its position earlier created by early delivery as bank normally covers itself against the position taken in the original forward contract.
- (b) *Interest on Outlay of Funds*: It might be possible early delivery request of a customer may result in outlay of funds. In such bank shall charge from the customer at a rate not less than prime lending rate for the period of early delivery to the original due date. However, if there is an inflow of funds the bank at its discretion may pass on interest to the customer at the rate applicable to term deposits for the same period.

12.32 Strategic Financial Management

Illustration 8

On 1 October 2015 Mr. X an exporter enters into a forward contract with a BNP Bank to sell US\$ 1,00,000 on 31 December 2015 at ₹ 65.40/\$. However, due to the request of the importer, Mr. X received amount on 28 November 2015. Mr. X requested the bank to take delivery of the remittance on 30 November 2015 i.e. before due date. The inter-banking rates on 28 November 2015 was as follows:

Spot	₹ 65.22/65.27
One Month Premium	10/15

If bank agrees to take early delivery then what will be net inflow to Mr. X assuming that the prevailing prime lending rate is 18%.

Solution

Bank will buy from customer at the agreed rate of ₹ 65.40. In addition to the same if bank will charge/pay swap difference and interest on outlay funds.

(a) Swap Difference

Bank Sells at Spot Rate on 28 November 2015	₹ 65.22
Bank Buys at Forward Rate of 31 December 2015 (65.27 + 0.15)	<u>₹ 65.42</u>
Swap Loss per US\$	<u>₹ 00.20</u>
Swap loss for US\$ 1,00,000	₹ 20,000

(b) Interest on Outlay Funds

On 28 th November Bank sells at	₹ 65.22
It buys from customer at	<u>₹ 65.40</u>
Outlay of Funds per US\$	<u>₹ 00.18</u>
Interest on Outlay fund for US\$ 1,00,000 for 31 days (US\$100000 x 00.18 x 31/365 x 18%)	₹ 275.00

(c) Charges for early delivery

Swap loss	₹ 20,000.00
Interest on Outlay fund for US\$ 1,00,000 for 31 days	<u>₹ 275.00</u>
	<u>₹ 20,275.00</u>

(d) Net Inflow to Mr. X

Amount received on sale (₹ 65.40 x 1,00,000)	₹ 65,40,000
Less: Charges for early delivery payable to bank	<u>(₹ 20,275)</u>
	<u>₹ 65,19,725</u>

Late Delivery

In case of late delivery current rate prevailing on such date of delivery shall be applied. However, before this delivery (execution) takes place the provisions of Automatic Cancellation (discussed later on) shall be applied.

Cancellation on Due Date

In case of cancellation on due date in addition of flat charges (if any) the difference between contracted rate and the cancellation rate (reverse action of original contract) is charged from/ paid to the customer.

Illustration 9

On 15th January 2015 you as a banker booked a forward contract for US\$ 250000 for your import customer deliverable on 15th March 2015 at ₹ 65.3450. On due date customer request you to cancel the contract. On this date quotation for US\$ in the inter-bank market is as follows:

Spot	₹ 65.2900/2975 per US\$
Spot/ April	3000/ 3100
Spot/ May	6000/ 6100

Assuming that the flat charges for the cancellation is ₹ 100 and exchange margin is 0.10%, then determine the cancellation charges payable by the customer.

Solution

Bank will buy from customer at the agreed rate of ₹ 65.40.

Since this is sale contract the contract shall be cancelled at ready buying rate on the date of cancellation as follows:

Spot Buying Rate on 15 March 2015	₹ 65.2900
Less: Exchange Margin	<u>₹ 0.0653</u>
	<u>₹ 65.2247</u>
Rounded to ₹ 65.2250	
Dollar sold to customer at	₹ 65.3450
Dollar bought from customer	<u>₹ 65.2250</u>
Net amount payable by the customer per US\$	<u>₹ 0.1200</u>
Amount payable by the customer	
Flat Charges	₹ 100.00
Cancellation Charges (₹ 0.12 x 250000)	<u>₹ 30,000.00</u>
	<u>₹ 30,100.00</u>

Early Cancellation

If a forward is required to be cancelled earlier than the due date of forward contract same shall be cancelled at opposite rate of original contract of the date that synchronizes with the date of original forward contract.

12.34 Strategic Financial Management

Illustration 10

You as a banker has entered into a 3 month's forward contract with your customer to purchase and 1,00,000 at the rate of ₹ 47.2500. However, after 2 months your customer comes to you and requests cancellation of the contract. On this date quotation for AUD in the market is as follows:

Spot	₹ 47.3000/3500 per AUD
1 month forward	₹ 47.4500/5200 per AUD

Determine the cancellation charges payable by the customer.

Solution

The contract shall be cancelled at the 1 month forward sale rate of ₹ 47.5200 as follows:

AUD bought from customer under original forward contract at	₹ 47.2500
On cancellation it is sold to him at	<u>₹ 47.5200</u>
Net amount payable by customer per AUD	<u>₹ 00.2700</u>

Thus, total cancellation charges payable by the customer ₹ 27,000

Late Cancellation

In case of late cancellation of Forward Contract the provisions of Automatic Cancellation (discussed later on) shall be applied.

Extension on Due Date

It might also be possible that an exporter may not be able to export goods on the due date. Similarly, it might also be possible that an importer may not to pay on due date. In both of these situations an extension of contract for selling and buying contract is warranted. Accordingly, if earlier contract is extended first it shall be cancelled and rebooked for the new delivery period. In case extension is on due date it shall be cancelled at spot rate as like cancellation on due date (discussed earlier) and new contract shall be rebooked at the forward rate for the new delivery period.

Illustration 11

Suppose you are a banker and one of your export customer has booked a US\$ 1,00,000 forward sale contract for 2 months with you at the rate of ₹ 62.5200 and simultaneously you covered yourself in the interbank market at ₹ 62.5900.

However, on due date, after 2 months your customer comes to you and requests for cancellation of the contract and also requests for extension of the contract by one month. On this date quotation for US\$ in the market was as follows:

Spot	₹ 62.7200/62.6800
1 month forward	₹ 62.6400/62.7400

Determine the extension charges payable by the customer assuming exchange margin of 0.10% on buying as well as selling.

Solution

Cancellation

First the original contract shall be cancelled as follows:

US\$/₹ Spot Selling Rate	₹ 62.7200
Add: Margin @ 0.10%	₹ <u>0.06272</u>
Net amount payable by customer per US\$	₹ <u>62.78272</u>
Rounded off	₹ 62.7825
Bank buys US\$ under original contract at	₹ 62.5200
Bank Sells at	₹ <u>62.7825</u>
	₹ <u>0.2675</u>

Thus total cancellation charges payable by the customer for US\$ 1,00,000 is ₹ 26,750.

Rebooking

Forward US\$/₹ Buying Rate	₹ 62.6400
Less: Margin @ 0.10%	₹ <u>0.06264</u>
Net amount payable by customer per US\$	₹ <u>62.57736</u>
Rounded off	₹ 62.5775

Extension before Due Date

In case any request to extend the contract is received before due date of maturity of forward contract, first the original contract would be cancelled at the relevant forward rate as in case of cancellation of contract before due date and shall be rebooked at the current forward rate of the forward period.

Illustration 12

Suppose you as a banker entered into a forward purchase contract for US\$ 50,000 on 5th March with an export customer for 3 months at the rate of ₹ 59.6000. On the same day you also covered yourself in the market at ₹ 60.6025. However on 5th May your customer comes to you and requests extension of the contract to 5th July. On this date (5th May) quotation for US\$ in the market is as follows:

Spot	₹ 59.1300/1400 per US\$
Spot/ 5 th June	₹ 59.2300/2425 per US\$
Spot/ 5 th July	₹ 59.6300/6425 per US\$

Assuming a margin 0.10% on buying and selling, determine the extension charges payable by the customer and the new rate quoted to the customer.

12.36 Strategic Financial Management

Solution

(a) Cancellation of Original Contract

The forward purchase contract shall be cancelled at the for the forward sale rate for delivery June.

Interbank forward selling rate	₹ 59.2425
Add: Exchange Margin	<u>₹ 0.0592</u>
Net amount payable by customer per US\$	<u>₹ 59.3017</u>
Rounded off, the rate applicable is ₹ 59.3000	
Buying US\$ under original contract at original rate	₹ 59.6000
Selling rate to cancel the contract	<u>₹ 59.3000</u>
Difference per US\$	<u>₹ 00.3000</u>

Exchange difference for US\$ 50,000 payable to the customer is ₹ 15,000.

(b) Rate for booking new contract

The forward contract shall be rebooked with the delivery 15th July as follows:

Forward buying rate (5 th July)	₹ 59.6300
Less: Exchange Margin	<u>₹ 0.0596</u>
Net amount payable by customer per US\$	<u>₹ 59.5704</u>

Rounded off to ₹ 59.5700

Late Extension

In case of late extension current rate prevailing on such date of delivery shall be applied. However, before this delivery the provisions of Automatic Cancellation (discussed later on) shall be applied.

Automatic Cancellation

As per FEDAI Rule 8 a forward contract which remains overdue without any instructions from the customers on or before due date shall stand automatically cancelled on 15th day from the date of maturity. Though customer is liable to pay the exchange difference arising there from but not entitled for the profit resulting from this cancellation.

For late delivery and extension after due date as mentioned above the contract shall be treated as fresh contract and appropriate rates prevailing on such date shall be applicable as mentioned below:

1. Late Delivery: In this case the relevant spot rate prevailing on the such date shall be applicable.

2. Extension after Due Date: In this case relevant forward rate for the period desired shall be applicable.

As mentioned earlier in both of above case cancellation charges shall be payable consisting of following:

- (i) *Exchange Difference:* The difference between Spot Rate of offsetting position (cancellation rate) on the date of cancellation of contract after due date or 15 days (whichever is earlier) and original rate contracted for.
- (ii) *Swap Loss:* The loss arises on account of offsetting its position created by early delivery as bank normally covers itself against the position taken in the original forward contract. This position is taken at the spot rate on the date of cancellation earliest forward rate of offsetting position.
- (iii) *Interest on Outlay of Funds:* Interest on the difference between the rate entered by the bank in the interbank market and actual spot rate on the due date of contract of the opposite position multiplied by the amount of foreign currency amount involved. This interest shall be calculated for the period from the due date of maturity of the contract and the actual date of cancellation of the contract or 15 days whichever is later.

Please note in above in any case there is profit by the bank on any course of action same shall not be passed on the customer as normally passed cancellation and extension on or before due dates.

Illustration 13

An importer booked a forward contract with his bank on 10th April for USD 2,00,000 due on 10th June @ ₹ 64.4000. The bank covered its position in the market at ₹ 64.2800.

The exchange rates for dollar in the interbank market on 10th June and 20th June were:

	10th June	20th June
Spot USD 1=	₹ 63.8000/8200	₹ 63.6800/7200
Spot/June	₹ 63.9200/9500	₹ 63.8000/8500
July	₹ 64.0500/0900	₹ 63.9300/9900
August	₹ 64.3000/3500	₹ 64.1800/2500
September	₹ 64.6000/6600	₹ 64.4800/5600

Exchange Margin 0.10% and interest on outlay of funds @ 12%. The importer requested on 20th June for extension of contract with due date on 10th August.

Rates rounded to 4 decimal in multiples of 0.0025.

On 10th June, Bank Swaps by selling spot and buying one month forward.

Calculate:

- (i) Cancellation rate
- (ii) Amount payable on \$ 2,00,000

12.38 Strategic Financial Management

- (iii) Swap loss
- (iv) Interest on outlay of funds, if any
- (v) New contract rate
- (vi) Total Cost

Solution

(i) Cancellation Rate:

The forward sale contract shall be cancelled at Spot TT Purchase for \$ prevailing on the date of cancellation as follows:

\$/ ₹ Market Buying Rate	₹ 63.6800
Less: Exchange Margin @ 0.10%	₹ 0.0636
	₹ 63.6163

Rounded off to ₹ 63.6175

(ii) Amount payable on \$ 2,00,000

Bank sells \$2,00,000 @ ₹ 64.4000	₹ 1,28,80,000
Bank buys \$2,00,000 @ ₹ 63.6163	₹ 1,27,23,260
Amount payable by customer	₹ 1,56,740

(iii) Swap Loss

On 10th June the bank does a swap sale of \$ at market buying rate of ₹ 63.8300 and forward purchase for June at market selling rate of ₹ 63.9500.

Bank buys at	₹ 63.9500
Bank sells at	₹ 63.8000
Amount payable by customer	₹ 0.1500

Swap Loss for \$ 2,00,000 in ₹ = ₹ 30,000

(iv) Interest on Outlay of Funds

On 10th April, the bank receives delivery under cover contract at ₹ 64.2800 and sell spot at ₹ 63.8000.

Bank buys at	₹ 64.2800
Bank sells at	₹ 63.8000
Amount payable by customer	₹ 0.4800

Outlay for \$ 2,00,000 in ₹ 96,000

Interest on ₹ 96,000 @ 12% for 10 days

₹ 320

(v) New Contract Rate

The contract will be extended at current rate

\$/ ₹ Market forward selling Rate for August	₹ 64.2500
Add: Exchange Margin @ 0.10%	₹ 0.0643
	₹ 64.3143

Rounded off to ₹ 64.3150

(vi) Total Cost

Cancellation Charges	₹ 1,56,740.00
Swap Loss	₹ 30,000.00
Interest	₹ 320.00
	₹ 1,87,060.00

13.3 Non-deliverable Forward Contract: A cash-settled, short-term forward contract on a thinly traded or non-convertible foreign currency, where the profit or loss at the time at the settlement date is calculated by taking the difference between the agreed upon exchange rate and the spot rate at the time of settlement, for an agreed upon notional amount of funds.

All NDFs have a fixing date and a settlement date. The fixing date is the date at which the difference between the prevailing market exchange rate and the agreed upon exchange rate is calculated. The settlement date is the date by which the payment of the difference is due to the party receiving payment.

NDFs are commonly quoted for time periods of one month up to one year and are normally quoted and settled in U.S. dollars. They have become a popular instrument for corporations seeking to hedge exposure to foreign currencies that are not internationally traded.

13.4 Rollover of Deliverable Forward Contract: Rollover of Deliverable Forward Contract is a Contract wherein, as an Exporter, you have no Foreign Currency to Deliver at maturity and as an Importer you have no Local Currency to deliver at maturity. As an Exporter or Importer you would like to rollover the contract which effectively means spot cancellation and booking of new contract for later date.

The rationale behind the rollover is:

- ❖ Non receipt of Foreign Currency from client (export perspective),
- ❖ Shortage of local currencies (Import perspective) ,
- ❖ Non-agreement of payment with clients,
- ❖ Non availability of longer period forward contracts as normally forward contracts are available maximum for one year and to hedge the exposure for the period more than one roll over contract shall be used.

14. Futures Contracts

A basic futures contract is very similar to the forward contract in its obligation and payoff profile.

There are some important distinctions between futures and forwards and swaps.

- The contract terms of futures are standardized. These encompass:
 - Quantity and quality of the underlying;
 - Time and place of delivery;
 - Method of payment.
 - ❖ Credit risk is standardized as this is greatly reduced by marking the contract to market on a daily basis with daily checking of position.
 - ❖ Futures are smaller in contract size than forwards and swaps, which means that they are available to a wider business market.

A financial futures contract is purchased or sold through a broker. It is a commitment to make or take delivery of a specified financial instrument, or perform a particular service, at predetermined date in the future. The price of the contract is established at the outset.

Distinction between Futures and Forward Contracts

There are major differences between the traditional forward contract and a futures contract. These are tabulated below:

Feature	Forward Contract	Futures Contract
Amount	Flexible	Standard amount
Maturity	Any valid business date agreed to by the two parties	Standard date. Usually one delivery date such as the second Tuesday of every month
Furthest maturity date	Open	12 months forward
Currencies traded	All currencies	Majors
Cross rates	Available in one contract; Multiple contracts avoided	Usually requires two contracts
Market-place	Global network	Regular markets – futures market and exchanges
Price fluctuations	No daily limit in many currencies	Daily price limit set by exchange
Risk	Depends on counter party	Minimal due to margin requirements

Honouring of contract	By taking and giving delivery	Mostly by a reverse transaction
Cash flow	None until maturity date	Initial margin plus ongoing variation margin because of market to market rate and final payment on maturity date
Trading hours	24 hours a day	4 – 8 hours trading sessions

15. Option Contracts

An option is a contract which has one or other of two key attributes:

- to buy (**call option**);
- or to sell (**put option**).

The purchaser is called the buyer or holder; the seller is called the writer or grantor. The premium may be expressed as a percentage of the price per unit of the underlying.

The holder of an **American option** has the right to exercise the contract at any stage during the period of the option, whereas the holder of a **European option** can exercise his right only at the end of the period.

During or at the end of the contract period (depending on the type of the option) the holder can do as he pleases. He can buy or sell (as the case may be) the underlying, let the contract expire or sell the option contract itself in the market.

Call Option: It is a contract that gives the buyer the right, but not the obligation, to buy a specified number of units of commodity or a foreign currency from the seller of option at a fixed price on or up to a specific date.

Put Option: It is a contract that gives the buyer the right, but not the obligation, to sell a specified number of units of commodity or a foreign currency to a seller of option at a fixed price on or up to a specific date.

Distinction between Options and Futures

There are certain fundamental differences between a futures and an option contract. Let us look at the main comparative features given below:

	Options	Futures
(a)	Only the seller (writer) is obliged to perform	Both the parties are obligated to perform.
(b)	Premium is paid by the buyer to the seller at the inception of the contract	No premium is paid by any party.
(c)	Loss is restricted while there is unlimited gain potential for the option buyer.	There is potential/risk for unlimited gain/loss for the futures buyer.

12.42 Strategic Financial Management

(d)	An American option contract can be exercised any time during its period by the buyer.	A futures contract has to be honoured by both the parties only on the date specified.
-----	---	---

Options Vs Futures: Gain and Losses in Different Circumstances

Price Movement	Type of Position Held					
	<i>Call buyer</i>	<i>Long Futures Position</i>	<i>Call Seller</i>	<i>Put Buyer</i>	<i>Short Futures Position</i>	<i>Put Seller</i>
<i>Price rises</i>	Unlimited gain	Unlimited gain	Unlimited loss	Limited loss	Unlimited loss	Limited gain
<i>Price falls</i>	Limited loss	Unlimited loss*	Limited gain	Unlimited gain*	Unlimited gain*	Unlimited loss*
<i>Price unchanged</i>	Limited loss	No gain or loss	Limited gain	Limited loss	No Gain or loss	Limited gain

Note: Transaction Costs are ignored.

*Since the price of any commodity; share or financial instrument cannot go below zero, there is technically a 'limit' to the gain/loss when the price falls. For practical purposes, this is largely irrelevant.

16. Swap Contracts

Swaps are infinitely flexible. In technical terms they are a method of exchanging the underlying economic basis of a debt or asset without affecting the underlying principal obligation on the debt or asset.

A swap transaction commits the participants to exchange cash flows at specified intervals, which are called payment or settlement dates. Cash flows are either fixed or calculated for specific dates by multiplying the quantity of the underlying by specified reference rates or prices.

The vast majority of swaps are classified into the following groups:

- ❖ Interest rate;
- ❖ Currency;
- ❖ Commodity;
- ❖ Equity.

The notional principal (i.e. the face value of a security) on all these, except currency swaps, is

used to calculate the payment stream but not exchanged. Interim payments are usually netted - the difference is paid by one party to the other.

Like forwards, the main users of swaps are large multinational banks or corporations. Swaps create credit exposures and are individually designed to meet the risk-management objectives of the participants.

16.1 Interest Rate Swaps: Interest Rate Swap has been covered in greater details in the Chapter 5 of this Study Material. Please refer the same from there.

16.2 Currency Swaps: It involves an exchange of liabilities between currencies. A currency swap can consist of three stages:

- ❖ A spot exchange of principal - this forms part of the swap agreement as a similar effect can be obtained by using the spot foreign exchange market.
- ❖ Continuing exchange of interest payments during the term of the swap - this represents a series of forward foreign exchange contracts during the term of the swap contract. The contract is typically fixed at the same exchange rate as the spot rate used at the outset of the swap.
- ❖ Re-exchange of principal on maturity.

A currency swap has the following benefits:

- ❖ Treasurers can hedge currency risk.
- ❖ It can provide considerable cost savings. A strong borrower in the Japanese Yen market may be interested in borrowing in the American USD markets where his credit rating may not be as good as it is in Tokyo. Such a borrower could get a better US dollar rate by raising funds first in the Tokyo market and then swapping Yen for US dollars.
- ❖ The swap market permits funds to be accessed in currencies, which may otherwise command a high premium.
- ❖ It offers diversification of borrowings.

A more complex version of a currency swap is a currency coupon swap, which swaps a fixed-or-floating rate interest payment in one currency for a floating rate payment in another. These are also known as *Circus Swaps*.

In a currency swap the principal sum is usually exchanged:

- ❖ At the start;
- ❖ At the end;
- ❖ At a combination of both; or
- ❖ Neither.

Many swaps are linked to the issue of a Eurobond. An issuer offers a bond in a currency and

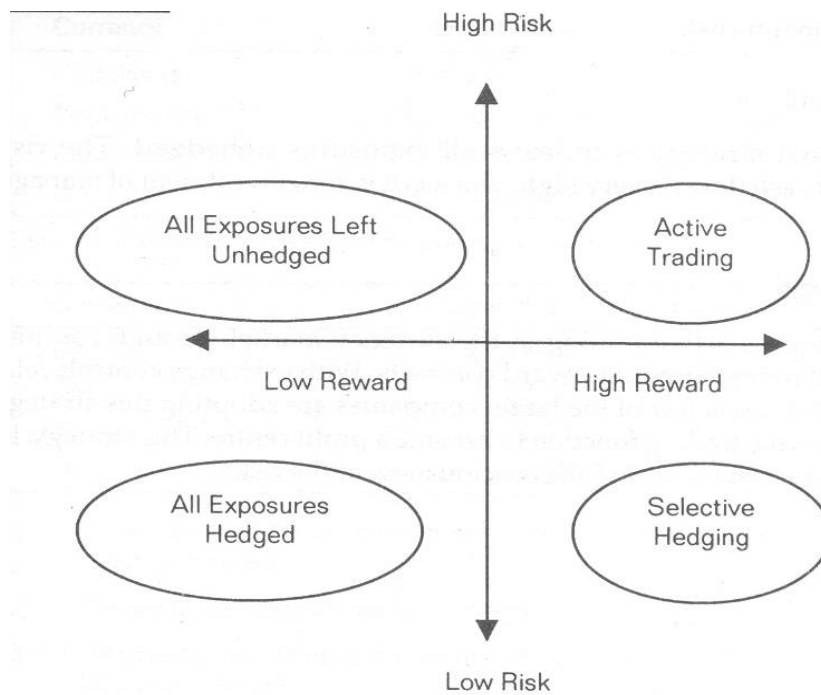
12.44 Strategic Financial Management

instrument where it has the greatest competitive advantage. It then asks the underwriter of the bond to provide it with a swap to convert funds into the required type.

16.3 Equity Swaps: An equity swap is an arrangement in which total return on equity or equity index in the form of dividend and capital is exchanged with either a fixed or floating rate of interest.

17. Strategies for Exposure Management

A company's attitude towards risk, financial strength, nature of business, vulnerability to adverse movements, etc shapes its exposure management strategies. There can be no single strategy which is appropriate to all businesses. Four separate strategy options are feasible for exposure management.



Exposure Management Strategies

17.1 Low Risk: Low Reward: This option involves automatic hedging of exposures in the forward market as soon as they arise, irrespective of the attractiveness or otherwise of the forward rate. The merits of this approach are that yields and costs of the transaction are known and there is little risk of cash flow destabilization. Again, this option doesn't require any investment of management time or effort. The negative side is that automatic hedging at whatever rates are available is hardly likely to result into optimum costs. At least some management seems to prefer this strategy on the grounds that an active management of exposures is not really their business. In the floating rate era, currencies outside their home countries, in terms of their exchange rate, have assumed the characteristics of commodities.

And business whose costs depend significantly on commodity prices can hardly afford not to take views on the price of the commodity. Hence this does not seem to be an optimum strategy.

17.2 Low Risk: Reasonable Reward: This strategy requires selective hedging of exposures whenever forward rates are attractive but keeping exposures open whenever they are not. Successful pursuit of this strategy requires quantification of expectations about the future and the rewards would depend upon the accuracy of the prediction. This option is similar to an investment strategy of a combination of bonds and equities with the proportion of the two components depending on the attractiveness of prices. In foreign exchange exposure terms, hedged positions are similar to bonds (known costs or yields) and unhedged ones to equities (uncertain returns).

17.3 High Risk: Low Reward: Perhaps the worst strategy is to leave all exposures unhedged. The risk of destabilization of cash flows is very high. The merit is zero investment of managerial time or effort.

17.4 High Risk: High Reward: This strategy involves active trading in the currency market through continuous cancellations and re-bookings of forward contracts. With exchange controls relaxed in India in recent times, a few of the larger companies are adopting this strategy. In effect, this requires the trading function to become a profit centre. This strategy, if it has to be adopted, should be done in full consciousness of the risks.

18. Misc. Illustrations

Illustration 14

A company operating in a country having the dollar as its unit of currency has today invoiced sales to an Indian company, the payment being due three months from the date of invoice. The invoice amount is \$ 7,500 and at today's spot rate of \$0.025 per ₹1, is equivalent to ₹ 3,00,000.

It is anticipated that the exchange rate will decline by 10% over the three months period and in order to protect the dollar proceeds, the importer proposes to take appropriate action through foreign exchange market. The three months forward rate is quoted as \$0.0244 per ₹1.

You are required to calculate the expected loss and to show, how it can be hedged by forward contract.

Solution

Calculation of the expected loss due to foreign exchange rate fluctuation

Present Cost

US \$7,500 @ today spot rate of US \$0.025 per Re. 1 = ₹ 3,00,000

Cost after 3 months

US \$7,500 @ expected spot rate of US \$0.0225 per Re. 1 = ₹ 3,33,333

(Refer to working note)

Expected loss = ₹ 33,333

Forward cover is available today at 1 Re. = US \$0.0244 for 3 months

12.46 Strategic Financial Management

If we take forward cover now for payment after 3 months net amount to be paid is (US \$ 7,500/0.0244)
= ₹ 3,07,377

Hence, by forward contract the company can cover ₹25,956 (₹33,333 – ₹7,377) i.e. about 78% of the expected loss.

Working Note:

Expected spot rate after 3 months

It is anticipated by the company that the exchange rate will decline by 10% over the three months period. The expected rate will be

Present rate - 10% of the present rate.

$$= \text{US } \$ 0.025 - 10\% \text{ of US } \$ 0.025$$

$$= \text{US } \$ 0.0225$$

Alternatively, the expected rate may also be calculated as follows:

$$= \text{US } \$ 0.025 \times \frac{90}{100} = \text{US } \$ 0.0225$$

Illustration 15

Fleur du lac, a French co., had shipped on Jan 2, 2012 goods to an American importer under a letter of credit arrangement, which calls for payment at the end of 90 days. The invoice is for \$ 124,000. On the date of shipment the exchange rate was 5.70 French francs to the \$ if the French franc were to strengthen by 5% by the end of 90 days what would be the transactions gain or loss in French francs? If it were to weaken by 5%, what would happen? (Note: may calculate in francs per \$)

Solution

The French franc strengthening by 5 percent means an exchange rate of $5.70 \times .95 = 5.415$ French francs to the dollar. The French franc weakening by 5 percent means an exchange rate of $5.70 \times 1.05 = 5.985$ French francs to the dollar.

French franc strengthens		French franc weakens	
Before: \$124,000 × 5.70	= FF 706,800	Before: \$124,000 × 5.70	= FF 706,800
After: 124,000 × 5.415	= FF <u>671,460</u>	After: 124,000 × 5.985	= FF <u>742,140</u>
Transaction loss	- FF <u>35,340</u>	Transaction gain	+ FF <u>35,340</u>

Illustration 16

India Imports co., purchased USD 100,000 worth of machines from a firm in New York, USA. The value of the rupee in terms of the Dollar has been decreasing. The firm in New York offers 2/10, net 90 terms. The spot rate for the USD is ₹ 55; the 90 days forward rate is ₹ 56.

- Compute the Rupee cost of paying the account within the 10 days.*
- Compute the Rupee cost of buying a forward contract to liquidate the account in 10 days.*
- The differential between part a and part b is the result of the time value of money (the discount for prepayment) and protection from currency value fluctuation. Determine the magnitude of each of these components.*

Solution

- a) $(98,000) (\₹55) = ₹53,90,000$
- b) $(100,000) (\₹56) = ₹56,00,000$
Differences = $₹56,00,000 - ₹53,90,000 = ₹2,10,000$
- c) Time value of money = $(100,000 - 98,000) (\₹ 56) = ₹1,12,000$
Protection from devaluation = $(98,000) (\₹56 - ₹55) = ₹9,80,000$

Illustration 17

Following are the rates quoted at Bombay for British pound:

BP/₹	52.60/70	Interest Rates	India	London
3 m Forward	20/70	3 months	8%	5%
6 m Forward	50/75	6 months	10%	8%

Verify whether there is any scope for covered interest arbitrage if you borrow rupees.

Solution

Particulars	Option I (3 mths)	Option II (6mths)
Amount borrowed	100000	100000
Pound obtained by converting at spot rate	$100000/52.70$ = 1897.53	$100000/52.70$ = 1897.53
Invest pound for the period	1.25%	4%
Amount of pound received at the end	1897.53×1.0125	1897.53×1.0
Of the period	= 1,921.25	= 1,973.43
Convert pounds to ₹ At forward rate	$1,921.25 \times 52.80$ = 1,01,441	$1,973.43 \times 53.10$ = 1,04,789
Amount of Re. Loan to be repaid	100000×1.02 = 102000	100000×1.05 = 105000

As the amount of Re. Received is less than the amount repaid there is no scope for covered interest arbitrage.

Illustration 18

A Company's international transfer of funds amounts to about \$2 million monthly. Presently the average transfer time is ten days. It has been proposed that the transfer of funds be turned over to one of the larger international banks, which can reduce the transfer time to an average of two days. A charge of one-half of 1 percent of the volume of transfer has been proposed for this service. In view of the fact that the firm's opportunity cost of funds is 12 percent, should this offer be accepted?

Solution

\$2,000,000 per month = \$24,000,000 per year.

12.48 Strategic Financial Management

Time saved = $10 - 2 = 8$ days funds are freed for other uses.

Investing \$24,000,000 at 12% for 8 days: Yield = $24,000,000 (0.12) (8/360) = \$64,000$

% yield = $64,000/24,000,000 = 0.00267$ or 0.267%

Since the firm saves less than 0.3% and the proposed charges is 0.5%, the services would not produce commensurate savings. However, the new transfer time would shorten the exposure of the funds to various risks by an average of 8 days. The firm must decide whether or not this reduction in risk is worth the difference between the proposed fee and the savings due to the shorter transfer time, $0.5\% - 0.267\% = 0.233\%$.

Mergers, Acquisitions & Restructuring

Learning Objective

After going through the chapter student shall be able to understand

- Introduction
- Reasons and Rationale for Mergers and Acquisitions
- Gains from Mergers or Synergy
- Accounting for Amalgamations
- Problems for M & A in India
- Mergers in specific sectors
- Acquisition and Takeover
- Takeover by Reverse Bid
- The Acquisition Process
- Defending a company in a takeover bid
- Legal Aspects of M & As
- Due Diligence
- Target Valuation for M & As
- Corporate Restructuring
- Financial Restructuring
- Merger Failures or Potential Adverse Competitive Effects
- Acquiring for shares
- Cross-Border M&A
- Decade of Corporate Churning and Change

1. Introduction

The most talked about subject of the day is Mergers & Acquisitions (M&A). In developed economies, corporate Mergers and Acquisition are a regular feature. In Japan, the US and

13.2 Strategic Financial Management

Europe, hundreds of mergers and acquisition take place every year. In India, too, mergers and acquisition have become part of corporate strategy today.

Mergers, acquisitions and corporate restructuring business in India have grown by leaps and bounds in the last decade. This tremendous growth was attributed to the fact that the foreign investors were looking for an alternative destination, preferable a growing economy as their own country was reeling under the pressure of recession. This was caused by the tough macro economic climate created due to Euro Zone crisis and other domestic reasons such as inflation, fiscal deficit and currency depreciation.

The terms 'mergers; 'acquisitions' and 'takeovers' are often used interchangeably in common parlance. However, there are differences. While merger means unification of two entities into one, acquisition involves one entity buying out another and absorbing the same. In India, in legal sense merger is known as 'Amalgamation'.

The amalgamations can be by merger of companies within the provisions of the Companies Act, and acquisition through takeovers. While takeovers are regulated by SEBI.M & A deals fall under the Companies Act. In cross border transactions, international tax considerations also arise.

Halsbury's *Laws of England* defined amalgamation as a blending of two or more existing undertakings, the shareholders of each **amalgamating** company becoming substantially the shareholders in the **amalgamating** company. Accordingly, in a merger, two or more companies combine into a single unit.

The term "amalgamation" is used when two or more companies are amalgamated or where one is merged with another or taken over by another. In *Inland steam Navigation Workers Union vs. R.S. Navigation Company Ltd.*, it was observed that in case of amalgamation, the rights and liabilities of a company are amalgamated into another so that the transferee company becomes vested with all rights and liabilities of the transferor company.

An **acquisition** is when both the acquiring and acquired companies are still left standing as separate entities at the end of the transaction. A **merger** results in the legal dissolution of one of the companies, and a **consolidation** dissolves both of the parties and creates a new one, into which the previous entities are merged.

Corporate takeovers were started by Swaraj Paul when he tried to takeover Escorts. The other major takeovers are that of Ashok Leyland by the Hindujas Shaw Wallace, Dunlop, and Falcon Tyres by the Chabbria Group; Ceat Tyres by the Goenkas; and Consolidated Coffee by Tata Tea. The BIFR arranged for the takeover of companies by giants like ITC, McDowells, Lakshmi Machine Works, and the Somani Group.

Many new companies are being incorporated as a result of the fast growing industrialisation of the country which is mainly dependent on agriculture. With the new trends of globalisation, not only in this country but also worldwide, there has been increasing interaction of companies and persons of one country with those of other countries. Today, corporate restructuring has gained momentum and undertakings and companies are merging, demerging, divesting and taking in or taking over companies and undertakings, both unregistered and registered, in India and outside.

Against this corporate backdrop, mergers and acquisitions have to be encouraged in the interest of the general public and for the promotion of industry and trade. At the same time the government has to safeguard the interest of the citizens, the consumers and the investors on the one hand and the shareholders, creditors and employees/workers on the other.

Chapter XV (Section 230 to 240) of Companies Act, 2013 (the Act) contains provisions on 'Compromises, Arrangements and Amalgamations', that covers compromise or arrangements, mergers and amalgamations, Corporate Debt Restructuring, demergers, fast track mergers for small companies/holding subsidiary companies, cross border mergers, takeovers, amalgamation of companies in public interest etc.

Special restructuring processes such as 'Reconstruction' of sick industrial companies envisaged by the Sick Industries (Special Provisions) Act, 1985 and 'Revival' of financially unviable companies envisaged by sec 72A of the Income Tax Act, 1961. However, all such mergers and acquisitions are also governed or controlled through relevant provisions of the Foreign Exchange Management Act, 1999; Income Tax Act, 1961; Industries (Development and Regulation) Act, 1951, the Competition Act 2002; the restrictions imposed by other relevant Acts including SEBI Act, 1992, as the case may be.

Amalgamation signifies the transfer of all or some part of the assets and liabilities of one or more than one existing company to another existing company or of two or more existing companies or to a new company, of which transferee company or all the members of the transferor company or companies become, or have the right of becoming, members and generally, such amalgamation is accomplished by a voluntary winding-up of the transferor company or companies.

Under an amalgamation, merger or takeover, two (or more) companies are merged either *de jure* by a consolidation of their undertakings or *de facto* by the acquisition of a controlling interest in the share capital of one by the other or of the capital of both by a new company.

Amalgamation is a state of things under which either two companies are so joined to form a third entity or one is absorbed into or blended with another."

"Generally, where only one company is involved in a scheme and the rights of the shareholders and creditors are varied, it amounts to **reconstruction or reorganisation or scheme of arrangement**. In an amalgamation, two or more companies are fused into one by merger or by one taking over the other. Amalgamation is a blending of two or more existing undertakings into one undertaking, the shareholders of each blending company become substantially the shareholders of the company which is to carry on the blended undertaking. There may be amalgamation either by the transfer of two or more undertakings to a new company, or by the transfer of one or more undertaking to an existing company. Strictly, 'amalgamation' does not cover the mere acquisition by a company of the share capital of the other company which remains in existence and continues its undertaking but the context in which the term is used may show that it is intended to include such an acquisition."

Types of Mergers

A merger is generally understood to be a fusion of two companies. The term "merger" means and signifies the dissolution of one or more companies or firms or proprietorships to form or

13.4 Strategic Financial Management

get absorbed into another company. By concept, merger increases the size of the undertakings. Following are major types of mergers:

- (i) **Horizontal Merger:** The two companies which have merged are in the same industry, normally the market share of the new consolidated company would be larger and it is possible that it may move closer to being a monopoly or a near monopoly to avoid competition.
- (ii) **Vertical Merger:** This merger happens when two companies that have 'buyer-seller' relationship (or potential buyer-seller relationship) come together.
- (iii) **Conglomerate Mergers:** Such mergers involve firms engaged in unrelated type of business operations. In other words, the business activities of acquirer and the target are neither related to each other horizontally (i.e., producing the same or competing products) nor vertically (having relationship of buyer and supplier). In a pure conglomerate merger, there are no important common factors between the companies in production, marketing, research and development and technology. There may however be some degree of overlapping in one or more of these common factors. Such mergers are in fact, unification of different kinds of businesses under one flagship company. The purpose of merger remains utilization of financial resources, enlarged debt capacity and also synergy of managerial functions.
- (iv) **Congeneric Merger:** In these mergers, the acquirer and the target companies are related through basic technologies, production processes or markets. The acquired company represents an extension of product-line, market participants or technologies of the acquirer. These mergers represent an outward movement by the acquirer from its current business scenario to other related business activities within the overarching industry structure
- (v) **Reverse Merger:** Such mergers involve acquisition of a public (Shell Company) by a private company, as it helps private company to by-pass lengthy and complex process required to be followed in case it is interested in going public.

Sometimes, it might be possible that a public company continuously a public traded corporation but it has no or very little assets and what remains only its internal structure and shareholders. This type of merger is also known as 'back door listing'. This kind of merger has been started as an alternative to go for public issue without incurring huge expenses and passing through cumbersome process. Thus, it can be said that reverse merger leads to the following benefits for acquiring company:

- Easy access to capital market.
- Increase in visibility of the company in corporate world.
- Tax benefits on carry forward losses acquired (public) company.
- Cheaper and easier route to become a public company.

2. Reasons and Rationale for Mergers and Acquisitions

The most common reasons for Mergers and Acquisition (M&A) are:

- **Synergistic operating economics:** Synergy May be defined as follows:

$$V(AB) > V(A) + V(B).$$

In other words the combined value of two firms or companies shall be more than their individual value. Synergy is the increase in performance of the combined firm over what the two firms are already expected or required to accomplish as independent firms (Mark L Sirower of Boston Consulting Group, in his book "The Synergy Trap"). This may be result of complimentary services economics of scale or both.

A good example of complimentary activities can a company may have a good networking of branches and other company may have efficient production system. Thus, the merged companies will be more efficient than individual companies.

On similar lines, economies of large scale is also one of the reasons for synergy benefits. The main reason is that, the large-scale production results in lower average cost of production e.g. reduction in overhead costs on account of sharing of central services such as accounting and finances, office executives, top level management, legal, sales promotion and advertisement etc.

These economies can be "real" arising out of reduction in factor input per unit of output, whereas pecuniary economics are realized from paying lower prices for factor inputs for bulk transactions. Other factors for synergy are as follows:

- **Diversification:** In case of merger between two unrelated companies would lead to reduction in business risk, which in turn will increase the market value consequent upon the reduction in discount rate/ required rate of return. Normally, greater the combination of statistically independent or negatively correlated income streams of merged companies, there will be higher reduction in the business risk in comparison to companies having income streams which are positively correlated to each other.
- **Taxation:** The provisions of set off and carry forward of losses as per Income Tax Act may be another strong season for the merger and acquisition. Thus, there will be Tax saving or reduction in tax liability of the merged firm. Similarly, in the case of acquisition the losses of the target company will be allowed to be set off against the profits of the acquiring company.
- **Growth:** Merger and acquisition mode enables the firm to grow at a rate faster than the other mode viz., organic growth. The reason being the shortening of 'Time to Market'. The acquiring company avoids delays associated with purchasing of building, site, setting up of the plant and hiring personnel etc.
- **Consolidation of Production Capacities and increasing market power:** Due to reduced competition, marketing power increases. Further, production capacity is increased by combined of two or more plants. The following table shows the key rationale for some of the well known transactions which took place in India in the recent past.

13.6 Strategic Financial Management

Rationale for M & A

Instantaneous growth, Snuffing out competition, Increased market share.	<ul style="list-style-type: none"> Airtel – Loop Mobile (2014) (Airtel bags top spot in Mumbai Telecom Circle)
Acquisition of a competence or a capability	<ul style="list-style-type: none"> Google – Motorola (2011) (Google got access to Motorola's 17,000 issued patents and 7500 applications)
Entry into new markets/product segments	<ul style="list-style-type: none"> Airtel – Zain Telecom (2010) (Airtel enters 15 nations of African Continent in one shot)
Access to funds	<ul style="list-style-type: none"> Ranbaxy – Sun Pharma (2014) (Daiichi Sankyo sold Ranbaxy to generate funds)
Tax benefits	<ul style="list-style-type: none"> Burger King (US) – Tim Hortons(Canada) (2014) (Burger King could save taxes in future)
Instantaneous growth, Snuffing out competition, Increased market share.	<ul style="list-style-type: none"> Facebook – Whatsapp (2014) (Facebook acquired its biggest threat in chat space)
Acquisition of a competence or a capability	<ul style="list-style-type: none"> Flipkart – Myntra (2014) (Flipkart poised to strengthen its competency in apparel e-commerce market)
Entry into new markets/product segments	<ul style="list-style-type: none"> Cargill – Wipro (2013) (Cargill acquired Sunflower Vanaspati oil business to enter Western India Market)
Access to funds	<ul style="list-style-type: none"> Jaypee – Ultratech (2014) (Jaypee sold its cement unit to raise funds for cutting off its debt)
Tax benefits	<ul style="list-style-type: none"> Durga Projects Limited (DPL) – WBPDC (2014) (DPL's loss could be carry forward and setoff)

Amalgamation is effected basically for growth and sometimes for image. Some of the objectives for which amalgamation may be resorted to are:

- Horizontal growth to achieve optimum size, to enlarge the market share, to curb competition or to use unutilised capacity;

- Vertical combination with a view to economising costs and eliminating avoidable sales-tax and/or excise duty;
- Diversification of business;
- Mobilising financial resources by utilising the idle funds lying with another company for the expansion of business. (For example, nationalisation of banks provided this opportunity and the erstwhile banking companies merged with industrial companies);
- Merger of an export, investment or trading company with an industrial company or *vice versa* with a view to increasing cash flow;
- Merging subsidiary company with the holding company with a view to improving cash flow;
- Taking over a 'shell' company which may have the necessary industrial licences etc., but whose promoters do not wish to proceed with the project.

An amalgamation may also be resorted to for the purpose of nourishing a sick unit in the group and this is normally a merger for keeping up the image of the group.

3. Gains from Mergers or Synergy

The first step in merger analysis is to identify the economic gains from the merger. There are gains, if the combined entity is more than the sum of its parts.

That is, Combined value > (Value of acquirer + Stand alone value of target)

The difference between the combined value and the sum of the values of individual companies is usually attributed to **synergy**.

$$\text{Value of acquirer} + \text{Stand alone value of target} + \text{Value of synergy} = \text{Combined value}$$

There is also a cost attached to an acquisition. The cost of acquisition is the price premium paid over the market value plus other costs of integration. Therefore, the net gain is the value of synergy minus premium paid.

$$V_A = ₹100$$

$$V_B = ₹ 50$$

$$V_{AB} = ₹ 175$$

$$\text{Synergy} = V_{AB} - (V_A + V_B) = 25$$

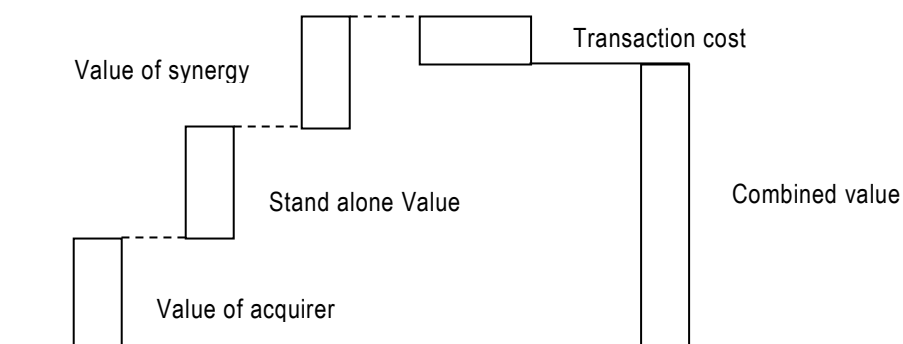
If premium is ₹ 10, Net gain = 25 – 10 = 15

The following depicts the synergy equation. Acquisition need not be made with synergy in mind. It is possible to make money from non-synergistic acquisitions as well. As can be seen from Exhibit, operating improvements are a big source of value creation. Better post-merger integration could lead to abnormal returns even when the acquired company is in unrelated business. Obviously, managerial talent is the single most important instrument in creating

13.8 Strategic Financial Management

value by cutting down costs, improving revenues and operating profit margin, cash flow position, etc. Many a time, executive compensation is tied to the performance in the post-merger period. Providing equity stake in the company induces executives to think and behave like shareholders.

Exhibit : Merger gains



Source : Patricia L Anslinger and Thomas E Copeland, 'Growth Through Acquisitions : A Fresh Look', *Harvard Business Review*, Jan–Feb., 1996.

There are five principal steps in a successful M & A programme.

1. Manage the pre-acquisition phase.
2. Screen candidates.
3. Eliminate those who do not meet the criteria and value the rest.
4. Negotiate.
5. Post-merger integration.

During the pre-acquisition phase, the acquirer should maintain secrecy about its intentions. Otherwise, the resulting price increase due to rumours may kill the deal.

Scheme of Amalgamation or Merger

The scheme of any arrangement or proposal for a merger is the heart of the process and has to be drafted with care.

There is no prescribed form for a scheme and it is designed to suit the terms and conditions relevant to the proposal and should take care of any special feature peculiar to the arrangement.

An essential component of a scheme is the provision for vesting all the assets and liabilities of the transferor company in its transferee company. If the transferee company does not want to take over any asset or liability, the transferor company before finalising the draft scheme should dispose it off or settle. Otherwise, the scheme would be considered defective and incomplete and the court would not sanction it.

It is equally important to define the **effective date** from which the scheme is intended to come into operation. This would save time and labour in explaining to the court the intention behind using several descriptions in the scheme. According to an order of the Central Government under Section 396 of the Companies Act, the entire business and undertaking of a transferor company shall be transferred to and vest with the transferee company on the day when it is notified in the Official Gazette. For accounting purposes, the amalgamation shall be effected with reference to the audited accounts and balance sheets as on a particular date (which precedes the date of notification) of the two companies and the transactions thereafter shall be pooled into a common account.

Another aspect relates to the **valuation of shares** to decide the exchange ratio. Objections have been raised as to the method of valuation even in cases where the scheme had been approved by a large majority of shareholders and the financial institutions as lenders. The courts have declared their unwillingness to engage in a study of the fitness of the mode of valuation. A High Court stated: "There are bound to be differences of opinion as to what the correct value of the shares of the company is. Simply because it is possible to value the share in a manner different from the one adopted in a given case, it cannot be said that the valuation agreed upon has been unfair." Similarly, in the case of Hindustan Lever the Supreme Court held that it would not interfere with the valuation of shares when more than 99 per cent of the shareholders have approved the scheme and the valuations having been perused by the financial institutions.

The position of employees also has to be clearly set out. The employment contract is a contract of personal service which may not be transferred by an order of court and may not have an effect of making an employee of the transferor company as an employee of the transferee company. The scheme should provide for the transfer of all employees to the transferee company on the same terms and conditions of service without any break in service. In the event of the transferee company not willing to absorb any of the employees through the merger, the transferor company should settle those employees with applicable law before the scheme is put through.

4. Accounting for Amalgamations

Accounting Standard 14 on *Accounting for Amalgamations*, issued by the Institute of Chartered Accountants of India which came into effect in respect of accounting periods commencing on or after April 1, 1995 is mandatory.

This statement deals with accounting for amalgamations and the treatment of any resultant goodwill or reserves.

The Standard prescribes two methods of accounting for amalgamations namely (a) the pooling of interests method and (b) the purchase method. The pooling of interests method is confined to circumstances which meet the criteria referred to in the definition of the amalgamation in the nature of merger. The object of the purchase method is to account for the amalgamation by applying the same principle as are applied in the normal purchase of assets. This method is used in accounting for amalgamations in the nature of purchase. Under the purchase method,

13.10 Strategic Financial Management

the transferee company accounts for the amalgamation either by incorporating the assets and liabilities at their existing carrying amounts or by allocating the consideration to individual identifiable assets and liabilities of the transferor company on the basis of their fair value at the date of amalgamation.

The Standard prescribes that if, at the time of amalgamation, the transferor and the transferee companies have conflicting accounting policies, a uniform accounting policy must be adopted following the amalgamation. (Note: Students are advised to refer to AS-14).

5. Problems for M & A in India

- Indian corporates are largely promoter-controlled and managed. The ownership stake should, in the normal course, inhibit any rational judgment on this sensitive issue. It is difficult for either of the two promoters to voluntarily relinquish management control in favour of the other, as a merger between two companies implies. In some cases, the need for prior negotiations and concurrence of financial institutions and banks is an added rider, besides SEBI's rules and regulations.
- The reluctance of financial institutions and banks to fund acquisitions directly.
- The BIFR route, although tedious, is preferred for obtaining financial concessions.
- Lack of Exit Policy for restructuring/downsizing.
- Absence of efficient capital market system makes the Market capitalisation not fair in some cases.
- Valuation is still evolving in India.

6. Mergers in specific sectors

The Companies Act and the SEBI's Takeover Code are the general source of guidelines governing mergers. There are sector specific legislative provisions, which to a limited extent empower the regulator to promote competition. For example, the Electricity Regulatory Commission has been given powers under the Electricity Act, 2003 to promote competition. Also, in the telecom and broadcasting Regulatory Authority of India (TRAI) Regulate mergers in these sectors and any dispute regarding the same is adjudicated by the Telecom Dispute Settlement Appellate Tribunal (TDSAT). Guidelines for (intra-circle mergers intra-circle mergers means mergers, of telecom service providers within the same geographical area or zone of operation) are also formulated by the TRAI.

In addition to the above authorities, approval may also be required from other sector-specific authorities. Mergers in the banking sector require approval from the RBI.

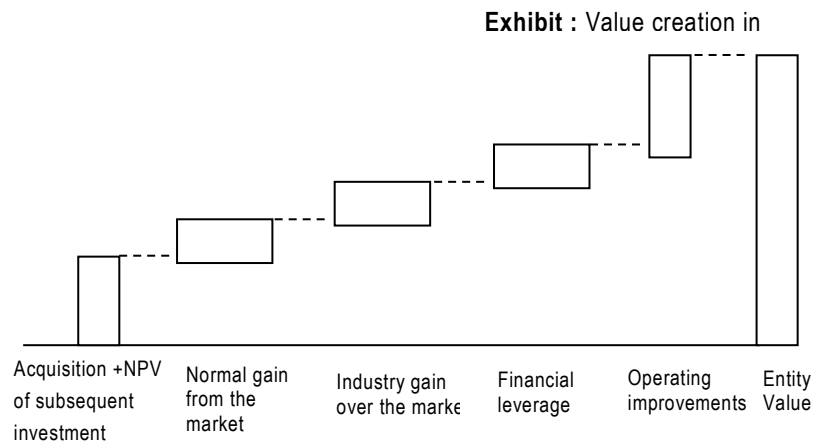
7. Acquisition and Takeover

7.1 Acquisition: This refers to the purchase of controlling interest by one company in the share capital of an existing company. This may be by:

- (i) an agreement with majority holder of Interest.
- (ii) Purchase of new shares by private agreement.

- (iii) Purchase of shares in open market (open offer)
- (iv) Acquisition of share capital of a company by means of cash, issuance of shares.
- (v) Making a buyout offer to general body of shareholders.

When a company is acquired by another company, the acquiring company has two choices either to merge both the companies into one and function as a single entity and the another is to operate the taken-over company as an independent entity with changed management and policies. ‘Merger’ is the fusion of two independent firms on co-equal terms. ‘Acquisition’ is buying out a company by another company and the acquired company usually loses its identity. Usually, this process is friendly.



Source: Patricia Anslinger and Thomas E Copeland, “Growth through Acquisitions : A Fresh look, *Harvard Business Review* Jan. – Feb -1996.

Acquisition of one of the business of a company, as a going concern by an agreement need not necessarily be routed through court, if the transfer of business is to be accomplished without allotting shares in the transferee company to the shareholders of the transferor company. This would tantamount to a simple acquisition. In this case the transferor company continues to exist and no change in shareholding is expected. If the sale takes place for a lumpsum consideration without attributing any individual values to any class of assets, such sales are called slump sales. The capital gains arising on slump sales were being exempt from income tax based on a decision of the Supreme Court of India.

7.2 Takeover: Normally acquisitions are made friendly, however when the process of acquisition is unfriendly (i.e., hostile) such acquisition is referred to as ‘takeover’. Hostile takeover arises when the Board of Directors of the acquiring company decide to approach the shareholders of the target company directly through a Public Announcement (Tender Offer) to buy their shares consequent to the rejection of the offer made to the Board of Directors of the target company.

Take Over Strategies: Other than Tender Offer the acquiring company can also use the following techniques:

13.12 Strategic Financial Management

- *Street Sweep*: This refers to the technique where the acquiring company accumulates larger number of shares in a target before making an open offer. The advantage is that the target company is left with no choice but to agree to the proposal of acquirer for takeover.
- *Bear Hug*: When the acquirer threatens the target to make an open offer, the board of target company agrees to a settlement with the acquirer for change of control.
- *Strategic Alliance*: This involves disarming the acquirer by offering a partnership rather than a buyout. The acquirer should assert control from within and takeover the target company.
- *Brand Power*: This refers to entering into an alliance with powerful brands to displace the target's brands and as a result, buyout the weakened company.

8. Takeover by Reverse Bid

In ordinary case, the company taken over is the smaller company; in a 'reverse takeover', a smaller company gains control of a larger one. The concept of takeover by reverse bid, or of reverse merger, is thus not the usual case of amalgamation of a sick unit which is non-viable with a healthy or prosperous unit but is a case whereby the entire undertaking of the healthy and prosperous company is to be merged and vested in the sick company which is non-viable. A company becomes a sick industrial company when there is erosion in its net worth. This alternative is also known as taking over by reverse bid.

The three tests should be fulfilled before an arrangement can be termed as a reverse takeover are specified as follows:

- (i) the assets of the transferor company are greater than the transferee company,
- (ii) equity capital to be issued by the transferee company pursuant to the acquisition exceeds its original issued capital, and
- (iii) the change of control in the transferee company through the introduction of a minority holder or group of holders.

9. The Acquisition Process

The acquisition process involves the following essential stages:

- (i) Defining the Acquisition Criteria
- (ii) Competitive analysis;
- (iii) Search and screen.
- (iv) Strategy development.
- (v) Financial evaluation.
- (vi) Target contact and negotiation.
- (vii) Due Diligence (in the case of a friendly acquisition)

- (viii) Arranging for finance for acquisition
- (ix) Putting through the acquisition and Post merger integration

(i) Defining the Acquisition Criteria

A company that has decided to go the inorganic growth route needs to fit in its acquisition criteria in conjunction with its acquisition strategy, which in turn should mesh with its business vision and mission. For example, acquisition criteria can be articulated as:-

- Annual Revenue of the target firm to be between ₹ xx million and ₹ yy million
- Annual EBITDA of the target firm to be between ₹ pp million and ₹ qq million
- Target firm should be aged between nn years to mm years
- Target firm should have established operations in Europe and Asia Pacific
- Target firm's number of customers with 5 million plus shall not less than 2 million
- Target firm has its products that are well entrenched in multiple markets

The following extract from the Annual Report of Berkshire Hathaway Inc., of 1998, talks about 'acquisition criteria'

We are eager to hear *from principals or their representatives* about businesses that meet all of the following criteria:

- (1) Large purchases (at least \$50 million of before-tax earnings),
- (2) Demonstrated consistent earning power (future projections are of no interest to us, nor are "turnaround" situations),
- (3) Businesses earning good returns on equity while employing little or no debt,
- (4) Management in place (we can't supply it),
- (5) Simple businesses (if there's lots of technology, we won't understand it),
- (6) An offering price (we don't want to waste our time or that of the seller by talking, even preliminarily, about a transaction when price is unknown).

The larger the company, the greater will be our interest: We would like to make an acquisition in the \$5-20 billion range. *We are not interested, however, in receiving suggestions about purchases we might make in the general stock market.*

We will not engage in unfriendly takeovers. We can promise complete confidentiality and a very fast answer -- customarily within five minutes -- as to whether we're interested. We prefer to buy for cash, but will consider issuing stock when we receive as much in intrinsic business value as we give.

(ii) Competitive Analysis.

The competitive analysis stage is to identify synergistic inter-relationship between the buyer and the target's business opportunities.

13.14 Strategic Financial Management

In search and screen stage a list of good acquisition candidates is developed. The screening process involves identifying a few of the best candidates that meet the established criteria. Once best apparent candidates have been identified, more detailed analysis for each will be initiated.

(iii) Search and Screen

This phase comprises initial market evaluation, market study and research and initial screening. Parts of this initial data-gathering phase, which could take a few days at most in the developed countries, where reliable third-party information is readily available, could last as long as two to three months in developing countries, where it is a far more painstaking and labor-intensive task to unearth company information.

Robert F Bruner, an authority on Mergers and Acquisitions, says 'Target Search is non-linear and sometimes even unruly'. Proper knowledge, experience and skills with capital transactions of in-house experts or internationally seasoned investment bankers is critical to the M&A process. It is usual for a corporate that is doing a scenario planning, to engage a set of investment bankers to identify prospective candidates for acquisition/takeover

(iv) Strategy Development

The strategy development calls for the development of a blue print for execution of acquisition. In particular, the strategy for the exploitation of apparent operational synergies would be delineated. The more an acquisition depends upon synergistic interrelationship, the greater is the need to develop a post-merger integration blueprint beforehand. In particular, once you have figured out what drives the value of the target firm, the acquisition strategy should sure that it is still there after the acquiring firm has acquired the business.

(v) Financial Evaluation

Next there is financial evaluation stage of the acquisition process. The central issues addressed in this stage include:

- (i) What is the maximum price that should be for the target company?
- (ii) What are the principal areas of Risk?
- (iii) What are the cash flow and balance sheet implications of the acquisition? and
- (iv) What is the best way of structuring the acquisition?

(vi) Target Contact and Negotiation.

Once a target Co. is identified, the acquirer company initiates the process of contacting the target firm. It is now a reasonably agreed protocol for the CEO/Executive Chairman of the acquiring company to talk to his/her counterpart of the target company. This enables the acquirer to quickly assess the other side's interest. A direct formal letter containing a purchase offer is certain to be construed as notice of a hostile acquisition, and hence is very undesirable.

When an acquirer approaches the target for merger/acquisition, the bidder must assess the target's response. This will involve evaluation of:-

Personalities in the opposite camp

Motivations for sale

Relation to the target – e.g. Promoters/Prof. Managers

Desire for independence

Post-acquisition expectations from the merger

Preference for payment – cash or equity

Evaluation of the above will enable the acquirer to be proactively manage the deal rather than being reactive

If the target company is interested, then it will be usually result in an agreement for exchange of information. At this point, pricing is in the air but not finalised. This agreement results in Non-Disclosure Agreement (NDA). NDA does not result in a Yes or No to the proposal – but enables both parties to start evaluating the deal from close quarters.

It is quite possible that the Executive Board of the target company could reject the advance made by the acquiring company. In such a road block, the acquiring company will have to take a call – whether it will still proceed with the acquisition process through a hostile takeover strategy or it will make a strategic exit. If the second decision is taken, the acquiring company goes back to the drawing board to identify the next target.

Assuming that the target company Board of Directors are interested in pursuing the deal, the next stage would be signing the Term Sheet.

Subsequent to NDA, both sides exchange information – most information is sought intensively about the target, its operations, financial details and other details, especially pending litigation. Based on the information exchanged, general terms and conditions of a possible deal are crystallized, usually after protracted negotiations.

The Acquirer will now issue a Letter of Intent (LOI) (also known as Term Sheet). Most importantly, LOI will contain the business interest to be acquired, price and warranties. LOI is a non-binding summary of the primary terms of what will eventually become part of a purchase agreement.

Once the LOI is signed, the due diligence process will start. Due diligence will usually be carried out by Statutory Auditors or by an established audit firm.

(vii) Due Diligence

According to a 2006 survey by Eco. Intelligence Unit (EIU) and Accenture, due diligence is one of the two most critical elements in the success of an Mergers and Acquisitions (M&A) transaction (the other being the proper execution of the integration process). Due diligence is considered to be of greater importance than target selection, negotiation, pricing the deal, and the development of the company's overall M&A strategy. 23% of CEOs consider Due diligence as the most challenging in domestic acquisitions. This % rises to 41% in the case of cross border acquisitions.

13.16 Strategic Financial Management

Areas to evaluate include finance, management, employees, IT, legal, risk management systems, culture, innovation, intangible assets (IPs, Patents, etc), corporate governance and ethics. There are different types of due diligence and the purpose of each will vary to assess different aspects of the target's business. The other additional purposes of 'Due Diligence' are:-

Identifying potential deal breakers – this will help the acquiring company in drafting the 'negotiating strategy'.

Identifying key points for 'post integration 30 days/90 days/180 days strategies' – the areas that require immediate management action

Due Diligence process could throw up previously unknown/undisclosed negatives and flaws in the target company's operations and finances. In such an eventuality, the acquiring firm may take a call either to abandon the deal or re-negotiate the terms and conditions built into the Term Sheet. Due Diligence process gives the last opportunity to the acquiring company Board of Directors to make a go or no-go decision. If the decision to 'go' is taken, 'Purchase Agreement' is signed. This is otherwise called 'Definitive Agreement'

(viii) Arranging Finance for Acquisition

Once the Definitive Agreement is signed, the Company Secretarial aspects relating to putting through the acquisition process will be taken up by the legal and secretarial department of both the companies. Side by side, the CFO of the acquiring company will move to the next stage which is 'Financing the Acquisition'.

One of the most important decisions is how to pay for the acquisition – cash or stock or part of each. And this would be part of the Definitive Agreement. If the acquisition is an 'all equity deal', the CFO's can breathe easy. However, if cash payout is significant, the acquirer has to plan for financing the deal. Sometimes acquirers do not pay all of the purchase consideration as, even though they could have sufficient funds. This is part of the acquisition strategy to keep the war chest ready for further acquisitions. Another reason to pay by shares would be when the acquirer considers that their company's shares are 'over priced' in the market.

Financing the acquisition can be quite challenging where the acquisition is a LBO. Many times strong companies plan to shore up their long term funds subsequent to the takeover. The immediate funding is accomplished with bridge financing.

(ix) Putting through the acquisition and Post-Acquisition Integration

It is in this stage that most M&As lose out – Companies do not realise that proof of the pudding is in the eating

Every acquirer must build an 'Integration Plan' document as soon as possible. The usual guiding principles that underpin an integration plan are:

- integrate the business quickly into one unit which is the right size for the future
- integrate and retain the best people from both organizations into one high performing team

- build support for the new organization with employees, customers and suppliers
- achieve valuation commitments.

It is usual for acquiring companies to make 30 days/90 days/ 180 days transition plan to ensure that immediate pressing needs of the acquisition are met. Whether it should be a 30 days/90 days/ 180 days will be determined after evaluation of the 'Due Diligence Report'.

A typical 90/100 days plan to cover the initial period of integration will have the following purposes:

- identify key events and activities that should take place in the first 100 days to achieve the above integration goals
- identify the required resources to integrate the new businesses
- develop a plan for each functional area including sales, marketing, finance, IT, HR and operations
- ensure open communication
- drive synergy realisation
- achieve transition from integration to business team.

Cultural differences have caused mergers to fail or prevented them from achieving their full potential. Cultural differences are certainly likely to surface when two different entities come together in a merger or acquisition, and become even more important as in a cross-border transaction.

10. Defending a Company in a Takeover Bid

The speed with which a hostile takeover is attempted puts the target Company at a disadvantage.

One of observations on the prevailing regulations pertaining to takeover is that, there is very little scope for a target company to defend itself in a takeover battle. Due to the prevailing guidelines, the target company without the approval of the shareholder cannot resort to any issuance of fresh capital or sale of assets etc., and also due to the necessity of getting approvals from various authorities. In the past most companies who wanted to resist a takeover, did so, either by getting a White Knight to support the Company or by refusing to transfer shares acquired by the Acquirer, followed by long protracted legal battle. Now under the guidelines, the target company cannot refuse transfer of shares without the consent of shareholders in a general meeting.

10.1 Defensive Tactics: A target company can adopt a number of tactics to defend itself from hostile takeover through a tender offer.

- **Divestiture** - In a *divestiture* the target company divests or spins off some of its businesses in the form of an independent, subsidiary company. Thus, reducing the attractiveness of the existing business to the acquirer.

13.18 Strategic Financial Management

- **Crown jewels** - When a target company uses the tactic of divestiture it is said to sell the crown jewels. In some countries such as the UK, such tactic is not allowed once the deal becomes known and is unavoidable.
- **Poison pill** - Sometimes an acquiring company itself becomes a target when it is bidding for another company. The tactics used by the acquiring company to make itself unattractive to a potential bidder is called poison pills. For instance, the acquiring company may issue substantial amount of convertible debentures to its existing shareholders to be converted at a future date when it faces a takeover threat. The task of the bidder would become difficult since the number of shares to having voting control of the company increases substantially.
- **Poison Put** - In this case the target company issue bonds that encourage holder to cash in at higher prices. The resultant cash drainage would make the target unattractive.
- **Greenmail** - Greenmail refers to an incentive offered by management of the target company to the potential bidder for not pursuing the takeover. The management of the target company may offer the acquirer for its shares a price higher than the market price.
- **White knight** - In this a target company offers to be acquired by a friendly company to escape from a hostile takeover. The possible motive for the management of the target company to do so is not to lose the management of the company. The hostile acquirer may change the management.
- **White squire** - This strategy is essentially the same as white knight and involves sell out of shares to a company that is not interested in the takeover. As a consequence, the management of the target company retains its control over the company.
- **Golden parachutes** - When a company offers hefty compensations to its managers if they get ousted due to takeover, the company is said to offer *golden parachutes*. This reduces their resistance to takeover.
- **Pac-man defence** - This strategy aims at the target company making a counter bid for the acquirer company. This would force the acquirer to defend itself and consequently may call off its proposal for takeover.

It is needless to mention that hostile takeovers, as far as possible, should be avoided as they are more difficult to consummate. In other words, friendly takeover are better course of action to follow.

11. Legal Aspects of M & As

Merger control requirements in India are currently governed by the provisions of the Companies Act and the Securities and Exchange Board of India (Substantial Acquisition of Shares and Takeovers) Regulations, 2011 ("the takeover code"). The provisions of the Takeover Code apply only to acquisition of shares in listed public companies. Although there is no definition of amalgamation or mergers in the Indian Companies Act, it is understood to mean an arrangement by which transfer of undertakings is affected. Other statues which governs merger proposals are the Industries (Development and Regulation) Act, 1951; the

Foreign Exchange Management Act, 1999, the Income Tax Act, 1961, SEBI Act, 1992, SEBI Takeover Code and Competition Act 2002.

12. Due Diligence

In the past, various authors have emphasized the importance of due diligence in M&A. The concept of due diligence has many dimensions such as:

- Due diligence is research, its purpose in M&A is to support the valuation process, arm negotiators, test the accuracy of representations and warranties contained in the merger agreement, fulfill disclosure requirements to investors, and inform the planners of post-merger integration.
- Due diligence is conducted in a wide variety of corporate finance settings, and is usually connected with the performance of a professional or fiduciary duty.
- It is the opposite of negligence.
- Weaknesses in the due diligence process may cause an M&A to fail.
- In addition, buyers in M&A may find “ignorance of knowledge risks to be a weak basis for a lawsuit seeking damages from sellers”.

A due diligence process should focus at least on the following issues:

- Legal issues: These include examining documents of asset ownership and associated liabilities; and whether the target company is in compliance with government regulations.
- Financial and tax issues: These include examining accounting records and reports to determine whether the target companies are in compliance with generally accepted accounting principles. In addition, the target company’s compliance with tax laws and regulations should be examined.
- Marketing issues: These include strengths and weaknesses of products and services provided by the target company and their domestic and foreign competition.
- Cross-border issues: These include foreign currency exchange risks, foreign laws and regulations, investment promotional agency and investment incentives, foreign banking and credit agencies, accounting principles, and local tax rules.
- Cultural and ethical issues: These cover cultural differences between the acquirer and target companies and how to deal with these differences; the degree of compliance with the acquirer’s ethical guidelines; and the exposure to liabilities and legal proceedings on unethical conduct such as patent and copyright violations, price fixing and others.

13. Target Valuation for M & As

The value of a business is a function of the business logic driving the M&As and is based on bargaining powers of buyers and sellers. Since business is based on expectations which are

13.20 Strategic Financial Management

dynamic, valuation also tends to be dynamic and not static which means that the same transaction would be valued by the same players at different values at two different times.

Thorough **due diligence** has to be exercised in deciding the valuation parameters since these parameters would differ from sector to sector and company to company.

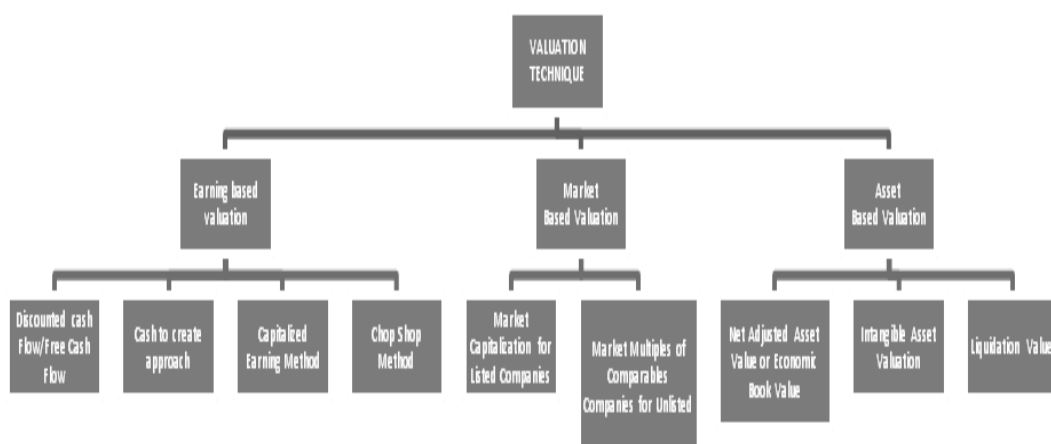
Because of the competitive nature of the acquisition market, companies not only need to respond wisely but often must respond quickly as well. The growing independence of corporate boards and their demand for better information to support strategic decisions such as acquisitions have raised the general standard for acquisition analysis. Sound analysis, convincingly, communicated also yields substantial benefits in negotiations with the target company's management or, in the case of tender offers, its shareholders.

After all, shareholders value creation depends not on pre-merger market valuation of the target company but on the actual acquisition price the acquiring company pays compared with the setting company's cash flow contribution to the combined company. Only a limited supply of acquisition, candidates is available at the price that enables the acquirer to earn an acceptable economic return on investment. A well conceived valuation programme that minimizes the risk of buying an economically unattractive company or paying too much for an attractive one is particularly important in today's market. The premium that must be paid by a successful bidder requires a more careful analysis by buyer than ever before.

There are also social and cultural issues post merger. There are primarily related to work culture, management style and human resources. Synergies fructify only when these issues could be sorted out very early in the merger.

We have studied valuation of stocks and bonds. You understand terms like BVPS (book value per share), Price to Book and P/E (price / earnings per share). Now question arises how do you value a firm?

There are several techniques to value a business as shown below:



13.1 Earnings Based Valuation

13.1.1 Discounted Cash Flow/Free Cash Flow valuation

This discounted cash-flow technique being the most common technique takes into consideration the future earnings of the business and hence the appropriate value depends on projected revenues and costs in future, expected capital outflows, number of years of projection, discounting rate and terminal value of business. This methodology is used to value companies since firms are essentially collection of projects. There are six steps involved in the valuation.

Step 1: Determine Free Cash Flow

Free cash flow to the Firm (FCFF) is the cash flow available to all investors in the company — both shareholders and bondholders after consideration for taxes, capital expenditure and working capital investment. Free cash flow to Equity (FCFE) is the cash flow available to only the equity shareholders after bondholders are paid their interest and the committed principal repayment for the year.

Free Cash Flow to Firm (FCFF) = NOPAT + Depreciation and Amortization – (Capital expenditure + Working capital investment)

Estimate the most likely incremental cash flows to be generated by the target company with the acquirer as owner (and not on as-is basis). Note that financing is not incorporated in the cash flows. Suitable adjustments for the specific financing of the acquisition will be made in the discount rate.

Step 2 : Estimate a suitable Discount Rate for the Acquisition

The acquiring company can use its weighted average cost of capital based on its target capital structure only if the acquisition will not affect the riskiness of the acquirer. If the acquirer intends to change the capital structure of the target company, suitable adjustments for the discount rate should be made. The discount rate should reflect the capital structure of the company after the acquisition. The appropriate discount rate for discounting FCFF is the Weighted Average Cost of Capital (WACC) and the discount rate for discounting FCFE is the Cost of Equity.

Step 3 : Calculate the Present Value of Cash Flows

Since the life of a going concern, by definition, is infinite, the value of the company is,

$$= \text{PV of cash flows during the forecast period} + \text{Terminal value}$$

We can set the forecast period in such a way that the company reaches a stable phase after that. In other words, we are assuming that the company will grow at a constant rate after the forecast period.

Step 4 : Estimate the Terminal Value

Generally it is quite difficult to estimate Terminal Value (TV) of a company because the end of explicit period represents a date when forecasted projections have no more meaning.

13.22 Strategic Financial Management

Generally analysts assumes that after explicit period the company enters in its maturity phase of business cycle. TV can be determined by using following methods:

(i) *On the basis of Capital Employed:* Usually this basis is used in some specific type of industries e.g. mining etc. Where we estimate liquidation value by adding up realizable value of various assets. Thus, under this method it is assumed that the company has a finite life, therefore scrap or realizable value of all assets is computed.

(ii) *On the basis of Multiple of Earnings:* Under this approach TV is determined by multiplying the forecasted terminal year profits by an available/appropriate price earning multiple. Normally, the current P/E multiple can also be used as proxy for future P/E multiple and can be calculated as follows:

$$TV = \text{Current market value of company} / \text{Current profit after tax}$$

Suppose, if the current market value of company is ₹ 576.20 crore and profit after tax is ₹ 82.30 crore,

$$\text{Then P/E} = 576.20 / 82.30 = 7$$

Further if last year's profit are ₹ 201.20 crore, then TV shall be

$$\begin{aligned} &= \text{Last year's profit} \times \text{P/E multiple} \\ &= ₹ 201.20 \text{ crore} \times 7 = ₹ 1408.40 \text{ crore} \end{aligned}$$

(iii) *On the basis of Free Cash Flow:* This is one of the popular method of estimating TV because future expected cash flows are discounted at a rate that reflects the riskiness of the projected cash flows.

It should however be noted that following two approaches can be employed to compute the TV.

(a) Growing Perpetuity: Under this approach we assume that cash flow grows at a constant rate after forecasted period and it is calculated as follows:

$$TV = [CF_t (1 + g)] / (k - g)$$

where,

CF_t = Cash flow in the last year

g = Constant Growth Rate

k = Discount rate or Cost of Capital

(b) Stable Perpetuity: This approach is followed when there is no Capital Expenditure or if it is there then it is equal to depreciation charged. In other words capital does not grow any more. In such situations cash flows becomes equal to Profit After Tax (PAT). Therefore, we can assume that the company earns a rate of return on capital employed is equal to Cost of Capital irrespective of Sales Growth.

The TV in such case shall be calculated as follows:

$$\begin{aligned} \text{TV} &= \text{Free Cash Flow} / \text{Discount Rate (Cost of Capital)} \\ &= \text{FCF}/k \end{aligned}$$

(iv) *On the basis of Multiple Book Value:* Under this method TV is estimated by multiplying an appropriate or available market-to-book ratio to forecasted book value of capital.

Generally, current Market Value/ Book Value (M/B) ratio is taken as proxy for the futures.

Example

The following information is related to A Ltd.

	Market Value (₹ Crore)	Book Value (₹ Crore)	M/B
Debt	792	792	1.00
Equity	1500	1000	1.50
Total	2292	1792	1.28

Now if book value of capital at the end of forecast period is ₹ 300 Crore, then TV shall be:

$$= ₹ 300 \text{ Crore} \times 1.28 = ₹ 3840 \text{ Crore}$$

It is very important to note that, since in case of Growing Perpetuity much of value comes from TV, which is quite sensitive assumption, the other methods can also be used to determine the TV.

Step 5 : Add Present Value of Terminal Value = TV x PVIF_{k,n}

Step 6 : Deduct the Value of Debt and Other Obligations Assumed by the Acquirer.

Thus, the method adopted by the analyst affects the final value placed on the company's equity. These four methods might give four different answers. However, the DCF approach can capture the value of assets in place. Some components of the acquisition are hard to quantify. Consequently, the final price paid by the acquirer might be much higher than the DCF value obtained. But the premium paid for the so-called synergy should not be out of proportion. We could think of the target company's value as:

Value of buyer = Value of seller + Value added by buyer + Change in value to buyer if target firm is acquired by competitor.

The first component is the DCF value of the target firm in its current form with the current growth rate, current financial plan, etc.

The second component, value added by acquirer comprises of synergy to acquirer, cost savings, value of new strategy after the acquisition, proceeds from sale of redundant assets adjusted for taxes benefits from improvement in credit-rating and other financing side-effects.

The third component is the gain or loss to the acquirer if the competitor manages to acquire the target. The sum total of these three components gives the maximum value of the target.

13.24 Strategic Financial Management

A sensitivity analysis may be conducted for pessimistic and optimistic values of key financial variables like sales growth rate, profit margin, working capital investment, capital expenditure, period of high growth, etc. The end product of such an analysis is a range of prices within the acquisition price may lie. Obviously, the acquirer would want to lower the price as much as possible and the opposite is true for the target. The important message is that the acquirer should consider not only what the target may be worth to the buyer but also what the target's next best alternative is likely to be. For example, suppose that when valued as a stand alone, a target is worth ₹ 100, whereas, due to synergies, the target is worth ₹ 150 as part of the buying firm. A key element in the negotiation process is the value of the target to another bidder. If the synergy is unique to the buyer, the buyer may purchase the company for one rupee more than the stand-alone value (₹ 101). On the other hand, if the synergy is available to other bidders as well, the buyer may have to raise the bid closer to ₹ 150. In other words, the valuation must take into account the uniqueness of synergy and the likely range of prices affordable by other bidders. To sum up, valuation has three elements — estimation of cash flows, estimation of discount rate, and sensitivity analysis.

Illustration 1

XYZ Ltd. is a paints manufacturer. The analyst's forecast of free cash flow is shown below:

Free cash flow forecast for XYZ Ltd.

(₹ in crore)

	Years							
	2013	2014	2015	2016	2017	2018	2019	2020
Sales	178.13	204.85	235.58	270.92	311.56	358.29	412.03	473.83
EBIT	16.33	17.25	17.19	19.58	22.17	24.95	27.89	30.95
NOPAT	10.61	11.21	11.17	12.73	14.41	16.22	18.13	20.12
+ Depreciation	3.14	2.13	2.68	2.82	2.96	3.11	3.26	3.42
Less :								
Capital exp.	0	0.63	2.36	1.79	1.88	1.97	2.07	2.17
Increase in working capital	0	6.44	4.12	6.10	9.45	11.67	12.97	14.32
Free cash flow	13.75	6.27	7.37	7.66	6.04	5.69	6.35	7.05

The cost of capital of the company is 15 per cent and value of debt is ₹7.92 crore. Assuming that the company acquiring XYZ Ltd. will not make any operating improvements or change the capital structure and analyst expects the cash flows to grow at 10 per cent forever after 2020, determine the value of Firm and Equity.

Solution

Present Value of Free Cash Flows

(₹ in crore)

	Years								
	2013	2014	2015	2016	2017	2018	2019	2020	
Free Cash Flow	13.75	6.27	7.37	7.66	6.04	5.69	6.35	7.05	
PVF@15%	0.870	0.756	0.658	0.572	0.497	0.432	0.376	0.327	
Present Value	11.96	4.74	4.85	4.38	3.00	2.46	2.39	2.31	
Total									36.09

Approach I: Terminal Value is a Growing Perpetuity

$$\begin{aligned} \text{Terminal value} &= \text{FCFF} \times (1 + g) / (k - g) \\ &= \frac{7.05(1.10)}{0.15 - 0.10} = \frac{7.755}{0.05} \\ &= ₹ 155.1 \text{ crore} \end{aligned}$$

$$\begin{aligned} \text{Present value of terminal value} &= 155.1 \times \text{PVIF} (15\%, 8) \\ &= 155.1 \times 0.327 = 50.72 \text{ crore} \end{aligned}$$

$$\text{Total value} = ₹ (36.09 + 50.72) = ₹ 86.81 \text{ crore}$$

$$\text{Value of Equity} = ₹ 86.81 \text{ crore} - ₹ 7.92 \text{ crore} = ₹ 78.89 \text{ crore}$$

Approach 2: Terminal Value is a Stable Perpetuity

$$\begin{aligned} \text{Terminal value} &= \left[\frac{\text{Free cash flow}}{\text{Discount rate}} \right] = \text{FCF} / k \\ &= \left[\frac{7.05}{0.15} \right] = ₹ 47 \text{ crores} \end{aligned}$$

$$\text{Value of the firm} = ₹ 36.09 \text{ crore} + ₹ 47.00 \text{ crore} \times 0.327 = ₹ 51.46 \text{ crore}$$

13.1.2 Cost to Create: In this approach, the cost for building up the business from scratch is taken into consideration and the purchase price is typically the cost plus a margin. This is suitable in cases like build-operate-transfer deals. The value of a business is estimated in the capitalized earnings method by capitalizing the net profits of the business of the current year or average of three years or projected years at required rate of return.

13.1.3 Capitalised Earning Method: A common method of valuing a business is also called the Capitalization of Earnings (or Capitalized Earnings) method. Capitalization refers to the return on investment that is expected by an investor. The value of a business is estimated in the capitalized earnings method by capitalizing the net profits of the business of the current year or average of three years or a projected year at required rate of return. There are many variations in how this method is applied. However, the basic logic is the same. Suppose you

13.26 Strategic Financial Management

had ₹ 1,00,000 to invest. You might look at different investment options available e.g. shares, bonds, or savings accounts etc. You would compare the potential return against the risk of each and make a judgment as to which is the best deal in your particular situation.

The same return on investment logic holds for buying a business. Capitalization methods (and other methods) for valuing a business are based upon return on the new entity's investment.

13.1.4 Chop-Shop Method: This approach attempts to identify multi-industry companies that are undervalued and would have more value if separated from each other. In other words as per this approach an attempt is made to buy assets below their replacement value. This approach involves following three steps:

Step 1: Identify the firm's various business segments and calculate the average capitalization ratios for firms in those industries.

Step 2: Calculate a "theoretical" market value based upon each of the average capitalization ratios.

Step 3: Average the "theoretical" market values to determine the "chop-shop" value of the firm.

Illustration 2

Using the chop-shop approach (or Break-up value approach), assign a value for Cornett GMBH. whose stock is currently trading at a total market price of €4 million. For Cornett, the accounting data set forth in three business segments: consumer wholesaling, specialty services, and assorted centers. Data for the firm's three segments are as follows:

Business segment	Segment sales	Segment assets	Segment income
Consumer wholesaling	€1,500,000	€ 750,000	€100,000
Specialty services	€800,000	€700,000	€150,000
Assorted centers	€2,000,000	€3,000,000	€600,000

Industry data for "pure-play" firms have been compiled and are summarized as follows:

Business segment	Capitalization/sales	Capitalization/assets	Capitalization/operating income
Consumer wholesaling	0.75	0.60	10.00
Specialty services	1.10	0.90	7.00
Assorted centers	1.00	0.60	6.00

Solution

Cornett, GMBH. – Break-up valuation

Business Segment	Capital-to-Sales	Segment Sales	Theoretical Values
Consumer wholesale	0.75	€1,500,000	€1,125,000
Specialty services	1.10	€800,000	€880,000
Assorted centers	1.00	€2,000,000	€2,000,000
Total value			€4,005,000

Business Segment	Capital-to-Sales	Segment Sales	Theoretical Values
Specialty services	0.60	€750,000	€450,000
Specialty services	0.90	€700,000	€630,000
Assorted centers	0.60	€3,000,000	<u>€1,800,000</u>
Total value			<u>€2,880,000</u>

Business Segment	Capital-to-Sales	Segment Sales	Theoretical Values
Consumer wholesale	10.00	€100,000	€1,000,000
Specialty services	7.00	€150,000	€1,050,000
Assorted centers	6.00	€600,000	<u>€3,600,000</u>
Total value			<u>€5,650,000</u>

$$\text{Average theoretical value} = \frac{4,005,000 + 2,880,000 + 5,650,000}{3} = 4,178,333.33 \text{ say } 4,178,000$$

Average theoretical value of Cornett GMBH. = €4,178,000

13.2 Market Based Valuation: While using the market based valuation for unlisted companies, comparable listed companies have to be identified and their market multiples (such as market capitalizations to sales or stock price to earnings per share) are used as surrogates to arrive at a value.

13.2.1 Market capitalization for listed companies: Method of evaluating the market capitalization for listed companies is same as Capitalized Earning Method except that here the basis is taken earning of similar type of companies.

13.2.2 Market multiples of comparable companies for unlisted company: This method is mainly concerned with the valuation of unlisted companies. In this method various Market multiples i.e. market value of a company's equity (resulting in Market Value of Equity Multiple) or invested capital (resulting in Market Value of Invested Capital) are divided by a company measure (or company fundamental financial variable) – earnings, book value or revenue of comparable listed companies are computed. These computed multiples are then adjusted in light of differences in under consideration company's growth, size or any company specific risk vis-à-vis as those of guideline company. Thereafter these adjusted market multiples are applied to the appropriate fundamental financial variable of the company under consideration to derive its value.

The basics of valuation for listed and unlisted company stay the same. Only thing that is limited with a unlisted company is the ready-made price market perceives for its equity etc. In such cases we need to carry out an exhaustive/ disciplined "Benchmarking Analysis" and identify the most applicable "normalised" median multiples for company under consideration. It is very necessary to ensure the proximity of the business model, size, profitability, geographical spread, risk patterns etc. of the comparable companies with the subject

company. Once this is done, it is as good as valuing any listed entity (of course you would need to make subject company specific adjustments say growth, competition etc.).

13.3 Asset Based Valuation : The asset based value considers either the book value (assets net liabilities) or the net adjusted value (revalued net assets). If the company has intangible assets like brands, copyrights, intellectual property etc., these are valued independently and added to the net asset value to arrive at the business value. Sometimes, if the business were not to be acquired on a going concern basis, the liquidation value (or the realization from sale of assets) is considered for the purpose of valuation.

13.3.1 Net Adjusted Asset Value or Economic Book Value: Valuation of a 'going concern' business by computed by adjusting the value of its all assets and liabilities to the fair market value. This method allows for valuation of goodwill, inventories, real estate, and other assets at their current market value. In other words this method includes valuation of intangible assets and also allows assets to be adjusted to their current market value.

13.3.2 Intangible Asset Valuation: Acceptable methods for the valuation of identifiable intangible assets and intellectual property fall into three broad categories. They are market based, cost based, or based on estimates of past and future economic benefits.

Cost-based methodologies, such as the "cost to create" or the "cost to replace" a given asset, assume that there is some relationship between cost and value and the approach has very little to commend itself other than ease of use. The method ignores changes in the time value of money and ignores maintenance.

The methods of valuation flowing from an estimate of past and future economic benefits (also referred to as the income methods) can be broken down in to four limbs as follows:

1. *The capitalization of historic profits* arrives at the value of intangible assets by multiplying the maintainable historic profitability of the asset by a multiple that has been assessed after scoring the relative strength of the intangible assets. For example, a multiple is arrived at after assessing a brand in the light of factors such as leadership, stability, market share, internationality, trend of profitability, marketing and advertising support and protection. While this capitalization process recognizes some of the factors which should be considered, it has major shortcomings, mostly associated with historic earning capability. The method pays little regard to the future.
2. *Gross profit differential methods* are often associated with trade mark and brand valuation. These methods look at the differences in sale prices, adjusted for differences in marketing costs. That is the difference between the margin of the branded and/or patented product and an unbranded or generic product. This formula is used to drive out cash-flows and calculate value. Finding generic equivalents for a patent and identifiable price differences is far more difficult than for a retail brand.
3. *The excess profits method* looks at the current value of the net tangible assets employed as the benchmark for an estimated rate of return. This is used to calculate the profits that are required in order to induce investors to invest into those net tangible assets. Any return over

and above those profits required in order to induce investment is considered to be the excess return attributable to the intangible assets. While theoretically relying upon future economic benefits from the use of the asset, the method has difficulty in adjusting to alternative uses of the asset.

4. *Relief from royalty* considers what the purchaser could afford, or would be willing to pay, for a licence of similar intangible assets. The royalty stream is then capitalized reflecting the risk and return relationship of investing in the asset.

13.3.3 Liquidation Value: This approach is similar to the book valuation method, except that the value of assets at liquidation is used instead of the book or market value of the assets. Using this approach, the liabilities of the business are deducted from the liquidation value of the assets to determine the liquidation value of the business. The overall value of a business using this method should be lower than a valuation reached using the standard book or adjusted book methods.

The liquidation value of a company is equal to what remains after all assets have been sold and all liabilities have been paid. It differs from book value in that assets would be sold at market prices, whereas book value uses the historical costs of assets. This is considered to be a better floor price than book value for a company, because if a company drops significantly below this price, then someone, such as a corporate raider, can buy enough stock to take control of it, and then liquidate it for a riskless profit. Of course, the company's stock price would have to be low enough to cover the costs of liquidating it and the uncertainty in what the assets would actually sell for in the marketplace.

Student may please note that the topic of 'Valuation' has also been covered in the paper 'Financial Reporting' wherein other different type of techniques of valuation has been discussed from reporting point of view. Students may refer to Chapter 9 in Study Material Vol. I on Financial Reporting. Students are expected to have a complete understanding of these techniques also.

14. Case Studies

Premiums and discounts are typically attached to a business valuation, based on the situation. These could be market share premium, controlling stake premium, brand value premium, small player discount or unlisted company discount. In addition, it may be required to work out various potential scenarios in each methodology and arrive at the likely probabilities of each while deriving the values.

Timing is very critical while divesting a business since valuation depends on the timing. Timing of sale is crucial keeping in mind economic cycles (deal valuation takes into consideration GDP growth rates), stock market situations (which would decide market multiples), global situations (*like a war or terrorist attacks*).

In times like the above, the price expectations between the buyer and the seller would widely vary. For example, during a stock market lull, there could be a situation where there are more buyers but not sellers due to the low valuation.

13.30 Strategic Financial Management

The basis for M&A is the expectation of several future benefits arising out of **synergies** between businesses. There is a risk involved in realizing this synergy value. This could be due to corporate, market, economic reasons or wrong estimation of the benefits/synergies. A key case in point here is the high valuations at which internet companies were acquired in the year 2000 (*such as Satyam Infoway acquisition of India World*).

It is also important to try and work out valuations from as many of the above methods as possible and then try and see which methodology is to be taken in and which are to be rejected and derive a range of values for the transaction in different situations in case one is called upon to assist in advising the transaction valuation. Some methods like Net Asset Value or past earnings based methods may prove inadequate in case of growing businesses or those with intangible assets.

Some case studies are listed below based on actual Indian situations and an analysis based on published data is given below.

14.1 Case Study – Rationale for M & A and Valuation

Bharti Airtel to buy Loop Mobile for ₹ 700 crores

In February 2014, Bharti Airtel (“Airtel”), a leading global telecommunications services provider with operations in 20 countries across Asia and Africa has announced to buy Mumbai based Loop Mobile. Although the price was not stated it is understood to be in the region of around ₹ 700 crores. The proposed association will undergo seamless integration once definitive agreements are signed and are subject to regulatory and statutory approvals. Under the agreement, Loop Mobile’s 3 million subscribers in Mumbai will join Airtel’s over 4 million subscribers, creating an unmatched mobile network in Mumbai. The merged network will be the largest by customer base in the Mumbai circle. The proposed transaction will bring together Loop Mobile’s 2G/EDGE enabled network supported by 2,500 plus cell sites, and Airtel’s 2G and 3G network supported by over 4000 cell sites across Mumbai. It will also offer subscribers the widest exclusive retail reach with 220 outlets that will enable best in class customer service. The agreement will ensure continuity of quality services to Loop Mobile’s subscribers, while offering them the added benefits of Airtel’s innovative product portfolio and access to superior services, innovative products like 3G, 4G, Airtel Money, VAS and domestic/international roaming facilities. Loop Mobile subscribers will become part of Airtel’s global network that serves over 289 million customers in 20 countries. Globally, Airtel is ranked as the fourth largest mobile services provider in terms of subscribers.

(Based on Press release hosted on Bharti Airtel’s website)

14.2 Case Study – Valuation Analysis

Listed software company X to merge with unlisted company Y

Company X and company Y were in the software services business. X was a listed company and Y was an unlisted entity. X and Y decided to merge in order to benefit from marketing. Operational synergies and economies of scale. With both companies being mid-sized, the merger would make them a larger player, open new market avenues, bring in expertise in

more verticals and wider management expertise. For company X, the benefit lies in merging with a newer company with high growth potential and for company Y, the advantage was in merging with a business with track record, that too a listed entity.

The stock swap ratio considered after valuation of the two businesses was 1:1.

Several key factors were considered to arrive at this valuation. Some of them were very unique to the businesses and the deal:

- Valuation based on book value net asset value would not be appropriate for X and Y since they are in the knowledge business, unless other intangibles assets like human capital, customer relationships etc. could be identified and valued.
- X and Y were valued on the basis of
(a) expected earnings (b) market multiple.
- While arriving at a valuation based on expected earnings, a higher growth rate was considered for Y, it being on the growth stage of the business life cycle while a lower rate was considered for X, it being in the mature stage and considering past growth.
- Different discount factors were considered for X and Y, based on their cost of capital, fund raising capabilities and debt-equity ratios.
- While arriving at a market based valuation, the market capitalization was used as the starting point for X which was a listed company. Since X had a significant stake in Z, another listed company, the market capitalization of X reflected the value of Z as well. Hence the market capitalization of Z had to be removed to the extent of X's stake from X's value as on the valuation date.
- Since Y was unlisted, several comparable companies had to be identified, based on size, nature of business etc. and a composite of their market multiples had to be estimated as a surrogate measure to arrive at Y's likely market capitalization, as if it were listed. This value had to be discounted to remove the listing or liquidity premium since the surrogate measure was estimated from listed companies.
- After arriving at two sets of values for X and Y, a weighted average value was calculated after allotting a higher weight for market based method for X (being a listed company) and a higher weight for earnings based method for Y (being an unlisted but growing company). The final values for X and Y were almost equal and hence the 1:1 ratio was decided.

14.3 Case Study – Rationale for M&A and Valuation

(1) Ranbaxy To Bring In Daiichi Sankyo Company Limited As Majority Partner– June 2008

Ranbaxy Laboratories Limited, among the top 10 generic companies in the world and India's largest pharmaceutical company, and Daiichi Sankyo Company Limited, one of the largest pharmaceutical companies in Japan, announced that a binding Share Purchase and Share

13.32 Strategic Financial Management

Subscription Agreement was entered into between Daiichi Sankyo, Ranbaxy and the Singh family, the largest and controlling shareholders of Ranbaxy (the "Sellers"), pursuant to which Daiichi Sankyo will acquire the entire shareholding of the Sellers in Ranbaxy and further seek to acquire the majority of the voting capital of Ranbaxy at a price of Rs737 per share with the total transaction value expected to be between US\$3.4 to US\$4.6 billion (currency exchange rate: US\$1=Rs43). On the post closing basis, the transaction would value Ranbaxy at US\$8.5 billion.

The Share Purchase and Share Subscription Agreement has been unanimously approved by the Boards of Directors of both companies. Daiichi Sankyo is expected to acquire the majority equity stake in Ranbaxy by a combination of (i) purchase of shares held by the Sellers, (ii) preferential allotment of equity shares, (iii) an open offer to the public shareholders for 20% of Ranbaxy's shares, as per Indian regulations, and (iv) Daiichi Sankyo's exercise of a portion or all of the share warrants to be issued on a preferential basis. All the shares/warrants will be acquired at a price of Rs737 per share. This purchase price represents a premium of 53.5% to Ranbaxy's average daily closing price on the National Stock Exchange for the three months ending on June 10, 2008 and 31.4% to such closing price on June 10, 2008.

The deal will be financed through a mix of bank debt facilities and existing cash resources of Daiichi Sankyo. It is anticipated that the transaction will be accretive to Daiichi Sankyo's EPS and Operating income before amortization of goodwill in the fiscal year ending March 31, 2010 (FY2009). EPS and Operating income after amortization of goodwill are expected to see an accretive effect in FY2010 and FY2009, respectively.

Why would Daiichi Sankyo wanted to acquire majority stake in Ranbaxy, that too at a premium?

Ranbaxy's drive to become a research-based drug developer and major manufacturer has led it straight into the welcoming arms of Japan's Daiichi Sankyo, that's why it announced to buy a majority stake in the Indian pharma company. After Sankyo completes a buyout of the founding Singh family's stake in the company, Ranbaxy will become a subsidiary operation. The deal is valued at \$4.6 billion and will create a combined company worth about \$30 billion. That move positions Daiichi Sankyo to become a major supplier of low-priced generics to Japan's aging population and accelerates a trend by Japanese pharma companies to enter emerging Asian markets, where they see much of their future growth. The acquisition stunned investors and analysts alike, who were caught off guard by a bold move from a conservative player in the industry. (Source: Fiercebiotech.com)

Also, from a financial and business perspective Ranbaxy's revenues and bottom lines were continuously on the rise since 2001; the R&D expenses were stable around 6%. In FY 2007 the company had revenues of 69,822 million INR (\$1.5billion) excluding other income. The earnings of the company were well diversified across the globe; however the emerging world contributed heavily to the revenues (Emerging 54%, Developed 40%, others 6%). However the Japan market, with low generics penetration contributed just \$25 million to the top line. The company had just begun to re-orient its strategy in favour of the emerging markets. The product, patent and API portfolio of the company was strong. The company made 526 product

filings and received 457 approvals globally. The Company then served customers in over 125 countries and had an expanding international portfolio of affiliates, joint ventures and alliances, operations in 56 countries. (Source: ukessays.com)

(2) Sun Pharma to acquire Ranbaxy in US\$4 billion – April 2014

Sun Pharmaceutical Industries Ltd. and Ranbaxy Laboratories Ltd today announced that they have entered into definitive agreements pursuant to which Sun Pharma will acquire 100% of Ranbaxy in an all-stock transaction. Under these agreements, Ranbaxy shareholders will receive 0.8 share of Sun Pharma for each share of Ranbaxy. This exchange ratio represents an implied value of ₹457 for each Ranbaxy share, a premium of 18% to Ranbaxy's 30-day volume-weighted average share price and a premium of 24.3% to Ranbaxy's 60-day volume-weighted average share price, in each case, as of the close of business on April 4, 2014. The transaction is expected to represent a tax-free exchange to Ranbaxy shareholders, who are expected to own approximately 14% of the combined company on a pro forma basis. Upon closing, Daiichi Sankyo will become a significant shareholder of Sun Pharma and will have the right to nominate one director to Sun Pharma's Board of Directors.

What prompted Daiichi Sankyo to decide on divestiture of the Indian Pharma company which it had barely acquired just about six years ago?

It has been a rocky path for Japanese pharma major Daiichi Sankyo ever since it acquired a 63.5 per cent stake in Indian drug maker Ranbaxy in June 2008. The Japanese drug-maker was expected to improve manufacturing process at Ranbaxy, which has a long history of run-ins with drug regulators in the US, its largest market, going back to 2002. Instead, serious issues persisted, resulting in a ban by the US Food & Drug Administration on most drugs and pharmaceutical ingredients made in Ranbaxy's four Indian manufacturing plants. Soon after the deal was inked, in September 2008, the US drug regulator - Food and Drug Administration - accused Ranbaxy of misrepresenting data and manufacturing deficiencies. It issued an import ban on Ranbaxy, prohibiting the export of 30 drugs to the US, within three months after Daiichi announced the acquisition. Following this, Ranbaxy's sales in the US shrank almost by a fourth, and its stock price slumped to over a fifth of the acquisition price. It has since taken Ranbaxy four years to reach a settlement with the US regulatory authorities. In 2013, The Company agreed to pay a fine of \$500 million after admitting to false representation of data and quality issues at its three Indian plants supplying to the US market. The company's problems in the US are far from done with. It continues to face challenges in securing timely approval for its exclusive products in the US markets. (Source: thehindubusinessline.com)

Why Sun Pharma take interest in acquiring Ranbaxy?

The combination of Sun Pharma and Ranbaxy creates the fifth-largest specialty generics company in the world and the largest pharmaceutical company in India. The combined entity will have 47 manufacturing facilities across 5 continents. The transaction will combine Sun Pharma's proven complex product capabilities with Ranbaxy's strong global footprint, leading to significant value creation opportunities. Additionally, the combined entity will have increased exposure to emerging economies while also bolstering Sun Pharma's commercial and

13.34 Strategic Financial Management

manufacturing presence in the United States and India. It will have an established presence in key high-growth emerging markets. In India, it will be ranked No. 1 by prescriptions amongst 13 different classes of specialist doctors.

Also, from a financial and business perspective on a pro forma basis, the combined entity's revenues are estimated at US\$ 4.2 billion with EBITDA of US\$ 1.2 billion for the twelve month period ended December 31, 2013. The transaction value implies a revenue multiple of 2.2 based on 12 months ended December 31, 2013. Sun Pharma expects to realize revenue and operating synergies of US\$ 250 million by third year post closing of the transaction. These synergies are expected to result primarily from topline growth, efficient procurement and supply chain efficiencies.

(Major contents are derived from press releases hosted on website of Ranbaxy)

In summary, the challenge to valuing for M&As is to obtain a thorough understanding of the business dynamics of both the parties, the rationale for the merger, the industry dynamics, the resulting synergies as well as the likely risks of the transaction are required in order to ensure that the valuation is such that it is a 'win-win' for both the parties and is financially viable. It is also important to understand that there are no hard and fast rules since one is projecting the future which is 'unknown' based on current understanding. Therefore, experience, good judgment and diligence are important in working out values.

15. Corporate Restructuring

Restructuring of business is an integral part of modern business enterprises. The globalization and liberalization of Control and Restrictions has generated new waves of competition and free trade. This requires Restructuring and Re-organisation of business organization to create new synergies to face the competitive environment and changed market conditions.

Restructuring usually involves major organizational changes such as shift in corporate strategies. Restructuring can be internally in the form of new investments in plant and machinery, Research and Development of products and processes, hiving off of non-core businesses, divestment, sell-offs, de-merger etc. Restructuring can also take place externally through mergers and acquisition (M&A) and by forming joint-ventures and having strategic alliances with other firms.

The topic of Mergers and Acquisition has already been discussed in previous section. It is now proposed to focus on Corporate Restructuring.

The aspects relating to expansion or contraction of a firm's operations or changes in its assets or financial or ownership structure are known as corporate re-structuring. While there are many forms of corporate re-structuring, mergers, acquisitions and takeovers, financial restructuring and re-organisation, divestitures de-mergers and spin-offs, leveraged buyouts and management buyouts are some of the most common forms of corporate restructuring. These forms are discussed herein as follows:

15.1 Demergers or Divestment: There are various reasons for divestment or demerger viz.,

- (i) To pay attention on core areas of business;
- (ii) The Division's/business may not be sufficiently contributing to the revenues;
- (iii) The size of the firm may be too big to handle;
- (iv) The firm may be requiring cash urgently in view of other investment opportunities.

Different ways of divestment or demerger are as follows:

Sell off: A sell off is the sale of an asset, factory, division, product line or subsidiary by one entity to another for a purchase consideration payable either in cash or in the form of securities.

Example: DLF Ltd completed the sale of its Luxury Hotel Unit Aman Resorts to a joint venture of Peak Hotels & Resorts Group and Zecha for \$360 million in 2014.

Spin-off: In this case, a part of the business is separated and created as a separate firm. The existing shareholders of the firm get proportionate ownership. So there is no change in ownership and the same shareholders continue to own the newly created entity in the same proportion as previously in the original firm. The management of spun-off division is however, parted with. Spin-off does not bring fresh cash. The reasons for spin off may be:

- (i) Separate identity to a part/division.
- (ii) To avoid the takeover attempt by a predator by making the firm unattractive to him since a valuable division is spun-off.
- (iii) To create separate Regulated and unregulated lines of business.

Example: Kishore Biyani led Future Group spin off its consumer durables business, Ezone, into a separate entity in order to maximise value from it.

Split-up: This involves breaking up of the entire firm into a series of spin off (by creating separate legal entities). The parent firm no longer legally exists and only the newly created entities survive. For instance, a corporate firm has 4 divisions namely A, B, C, D. All these 4 division shall be split-up to create 4 new corporate firms with full autonomy and legal status. The original corporate firm is to be wound up. Since de-merged units are relatively smaller in size, they are logistically more convenient and manageable. Therefore, it is understood that spin-off and split-up are likely to enhance shareholders value and bring efficiency and effectiveness.

Example: Philips, the Dutch conglomerate that started life making light bulbs 123 years ago, is splitting off its lighting business in a bold step to expand its higher-margin healthcare and consumer divisions. The new structure should save 100 million euros (\$128.5 million) next year and 200 million euros in 2016. It expects restructuring charges of 50 million euros from 2014 to 2016.

Carve outs: This is like spin off however; some shares of the new company are sold in the market by making a public offer, so this brings cash. In carve out, the existing company may sell either majority stake or minority stake, depending upon whether the existing management wants to continue to control it or not.

13.36 Strategic Financial Management

Example – Encana Corp., North America's second-largest producer of natural gas, split itself into two, jettisoning most of its oil assets by carving out oil sands producer Cenovus Energy Inc in 2009.

Sale of a Division: In the case of sale of a division, the seller company is demerging its business whereas the buyer company is acquiring a business. For the first time the tax laws in India propose to recognise demergers.

15.2 Demerger or Division of Family-Managed Business: Around 80 per cent of private sector companies in India are family-managed companies. The family-owned companies are, under extraordinary pressure to yield control to professional managements, as, in the emerging scenario of a liberalised economy the capital markets are broadening, with attendant incentives for growth. So, many of these companies are arranging to hive off their unprofitable businesses or divisions with a view to meeting a variety of succession problems. Even otherwise, a group of such family-managed companies may undertake restructuring of its operations with a view also to consolidating its core businesses. For this, the first step that may need to be taken is to identify core and non-core operations within the group. The second step may involve reducing interest burden through debt restructuring along with sale of surplus assets. The proceeds from the sale of assets may be employed for expanding by acquisitions and rejuvenation of its existing operations. The bottom line is that an acquisition must improve economies of scale, lower the cost of production, and generate and promote synergies. Besides acquisitions, therefore, the group may necessarily have to take steps to improve productivity of its existing operations.

15.3 Corporate Controls

Going Private: This refers to the situation wherein a listed company is converted into a private company by buying back all the outstanding shares from the markets.

Example: The Essar group successfully completed Essar Energy Plc delisting process from London Stock Exchange in 2014.

Equity buyback: This refers to the situation wherein a company buys back its own shares back from the market. This results in reduction in the equity capital of the company. This strengthen the promoter's position by increasing his stake in the equity of the company.

Example Cairn India bought back 3.67 crores shares and spent nearly ₹ 1230 crores by May 2014.

Restructuring of an existing business: An existing business in the face of impending onslaught of international competition or even otherwise, may require restructuring. Such restructuring may involve, for instance, downsizing and closing down of some unprofitable departments. So also, trimming the number of personnel. There may also arise a case of restructuring of a company where for instance, there has been a failure of management, or for the matter of that, to overcome a wrong business or financial decision. In such a situation, the company may sell or close certain divisions, pay off debt, focus on more promising lines of business and focus hard to enhance shareholder value. Restructuring may also involve a long-drawn process. The interesting part is that the process of change has affected stock prices of

these companies. And the same can be expected of their domestic subsidiaries after a while unless business dynamics or holding structure widely differ.

Buy-outs: This has two versions. The classical version where the current management of a company or business division 'buys out' the company/division from the owners/promoters (i.e., shareholders or the company). This happens due to the owners/promoters losing interest in the line of business or due to the accumulating losses. The takeover of Escorts Auto Components Ltd. by its CEO (Bharat Caprihan) and six other CXOs in 2004 was probably the first such reported transaction. There's another example where Liquid Comics has completed the management buyout of the Virgin Comics (a Virgin Group company) in 2008 led by the founding management team of Gotham Chopra, Sharad Devarajan and Suresh Seetharaman. Usually there will be a banker/financier/PE who will bankroll the transaction. This MBO was followed up by the PE Firm Actis helping out the CEO team in Phoenix Lamps. In 2008, Intelenet Global Services Private Limited was bought out by its CXO Team led by Susit Kumar with the support of Blackstone Group from the original promoters of the Company viz., Tata Consultancy Services and HDFC.

The newer version of MBO relates to an active PE who goes after weak managements and buys out the stake and the brings in their CXOs to Manage the Business – the PE gets actively involved in the Management and turns over the company into a profitable opportunity and exits at the right time. The Management Team that comes in takes stake in the equity capital of the company while coming on board and hence the term Management Buy-in.

In recessionary periods buy-outs can play a big part in restructuring of failed or failing businesses and in an environment of generally weakened corporate performance often represent the only viable purchasers when parents wish to dispose of subsidiaries.

Buy-outs are one of the most common forms of privatisation, offering opportunities for enhancing the performances of parts of the public sector, widening employee ownership and giving managers and employees incentives to make best use of their expertise in particular sectors.

Buy-outs will typically be financed by a mixture of senior secured debt and a range of equity and quasi-equity instruments. For larger buy-outs, especially when auctions and buoyant conditions mean that prices well in excess of the security value of assets have to be paid, subordinated (mezzanine debt) may be used. Quasi-equity instruments, such as cumulative convertible participating preferred ordinary shares, are important both in ensuring the venture capitalist obtains a regular dividend and in putting pressure on managers to perform and/or seek to realise an investment in a timely fashion.

Seller's Perspective: It is necessary to remember that for every buyer there must be a seller. Although the methods of analysis for selling are the same as for buying, the selling process is termed **divestiture**. The decision to sell a company is at least as important as buying one. But selling generally lacks the kind of planning that goes into buying. Quite often, the decision and the choice of the buyer is arbitrary, resulting in a raw deal for the selling company's shareholders. It is important to understand that selling needs the same set of skills required for buying. At some point of time the executives of a company may have to take the decision to divest a division There is nothing wrong in selling a division if it is worth more to someone

13.38 Strategic Financial Management

else. The decision to sell may be prompted by poor growth prospects for a division or consolidation in the industry. Given the fact that the need to sell may arise any time, it makes sense for executives to be prepared. More specifically, executives need to know their company's worth. Consideration may be given to strengths and weakness in production, marketing, general management, value of synergy to potential buyers, value of brand equity, skill base of the organisation, etc.

To summarise, the following are some of the 'sell-side' imperatives

- Competitor's pressure is increasing.
- Sale of company seems to be inevitable because company is facing serious problems like:
 - No access to new technologies and developments
 - Strong market entry barriers. Geographical presence could not be enhanced
 - Badly positioned on the supply and/or demand side
 - Critical mass could not be realised
 - No efficient utilisation of distribution capabilities
 - New strategic business units for future growth could not be developed
 - Not enough capital to complete the project
- Window of opportunity: Possibility to sell the business at an attractive price
- Focus on core competencies
- In the best interest of the shareholders – where a large well known firm brings-up the proposal, the target firm may be more than willing to give-up

16. Financial Restructuring

Financial restructuring refers to a kind of internal changes made by the management in Assets and Liabilities of a company with the consent of its various stakeholders. This is a suitable mode of restructuring for corporate entities who have suffered from sizeable losses over a period of time. Consequent upon losses the share capital or net worth of such companies get substantially eroded. In fact, in some cases, the accumulated losses are even more than the share capital and thus leading to negative net worth, putting the firm on the verge of liquidation. In order to revive such firms, financial restructuring is one of the technique to bring into health such firms which are having potential and promise for better financial performance in the years to come. To achieve this desired objective, such firms need to re-start with a fresh balance sheet free from losses and fictitious assets and show share capital at its true worth.

To nurse back such firms a plan of restructuring need to be formulated involving a number of legal formalities (which includes consent of court, and other stake-holders viz., creditors, lenders and shareholders etc.). An attempt is made to do refinancing and rescue financing while Restructuring. Normally equity shareholders make maximum sacrifice by foregoing

certain accrued benefits, followed by preference shareholders and debenture holders, lenders and creditors etc. The sacrifice may be in the form of waving a part of the sum payable to various liability holders. The foregone benefits may be in the form of new securities with lower coupon rates so as to reduce future liabilities. The sacrifice may also lead to the conversion of debt into equity. Sometime, creditors, apart from reducing their claim, may also agree to convert their dues into securities to avert pressure of payment. These measures will lead to better financial liquidity. The financial restructuring leads to significant changes in the financial obligations and capital structure of corporate firm, leading to a change in the financing pattern, ownership and control and payment of various financial charges.

In nutshell it may be said that financial restructuring (also known as internal re-construction) is aimed at reducing the debt/payment burden of the corporate firm. This results into

- (i) Reduction/Waiver in the claims from various stakeholders;
- (ii) Real worth of various properties/assets by revaluing them timely;
- (iii) utilizing profit accruing on account of appreciation of assets to write off accumulated losses and fictitious assets (such as preliminary expenses and cost of issue of shares and debentures) and creating provision for bad and doubtful debts. In practice, the financial restructuring scheme is drawn in such a way so that all the above requirements of write off are duly met. The following illustration is a good example of financial restructuring.

Illustration 3

The following is the Balance-sheet of XYZ Company Ltd as on March 31st, 2013.

(₹ in lakh)

Liabilities	Amount	Assets	Amount
6 lakh equity shares of ₹100/- each	600	Land & Building	200
2 lakh 14% Preference shares of ₹100/- each	200	Plant & Machinery	300
13% Debentures	200	Furniture & Fixtures	50
Debenture Interest accrued and Payable	26	Inventory	150
Loan from Bank	74	Sundry debtors	70
Trade Creditors	300	Cash at Bank	130
		Preliminary Expenses	10
		Cost of Issue of debentures	5
		Profit & Loss A/c	485
	1,400		1,400

The XYZ Company did not perform well and has suffered sizable losses during the last few years. However, it is now felt that the company can be nursed back to health by proper financial restructuring and consequently the following scheme of reconstruction has been devised:

- (i) Equity shares are to be reduced to ₹ 25/- per share, fully paid up;

13.40 Strategic Financial Management

- (ii) Preference shares are to be reduced (with coupon rate of 10%) to equal number of shares of ₹50 each, fully paid up.
- (iii) Debenture holders have agreed to forego interest accrued to them. Beside this, they have agreed to accept new debentures carrying a coupon rate of 9%.
- (iv) Trade creditors have agreed to forgo 25 per cent of their existing claim; for the balance sum they have agreed to convert their claims into equity shares of ₹ 25/- each.
- (v) In order to make payment for bank loan and augment the working capital, the company issues 6 lakh equity shares at ₹ 25/- each; the entire sum is required to be paid on application. The existing shareholders have agreed to subscribe to the new issue.
- (vi) While Land and Building is to be revalued at ₹ 250 lakh, Plant & Machinery is to be written down to ₹ 104 lakh. A provision amounting to ₹ 5 lakh is to be made for bad and doubtful debts.

You are required to show the impact of financial restructuring/re-construction. Also, prepare the new balance sheet assuming the scheme of re-construction is implemented in letter and spirit.

Solution

Impact of Financial Restructuring

- (i) Benefits to XYZ Ltd.

		₹ in lakhs
(a)	<i>Reduction of liabilities payable</i>	
	Reduction in equity share capital (6 lakh shares × ₹75 per share)	450
	Reduction in preference share capital (2 lakh shares × ₹50 per share)	100
	Waiver of outstanding debenture Interest	26
	Waiver from trade creditors (₹300 lakhs × 0.25)	<u>75</u>
		<u>651</u>
(b)	<i>Revaluation of Assets</i>	
	Appreciation of Land and Building (₹250 lakhs - ₹200 lakhs)	<u>50</u>
		<u>701</u>

- (ii) Amount of ₹701 lakhs utilized to write off losses, fictitious assets and over-valued assets.

	₹ in lakhs
Writing off profit and loss account	485
Cost of issue of debentures	5
Preliminary expenses	10
Provision for bad and doubtful debts	5
Revaluation of Plant and Machinery (₹300 lakhs – ₹104 lakhs)	<u>196</u>
	<u>701</u>

Balance sheet of XYZ Ltd as at _____ (after re-construction)

(₹ in lakhs)

Liabilities	Amount	Assets	Amount
21 lakhs equity shares of ₹25/- each	525	Land & Building	250
2 lakhs 10% Preference shares of ₹50/- each	100	Plant & Machinery	104
9% Debentures	200	Furnitures & Fixtures	50
		Inventory	150
		Sundry debtors	70
			<u>-5</u>
		Cash-at-Bank	206
		(Balancing figure)*	
	825		825

*Opening Balance of ₹130/- lakhs + Sale proceeds from issue of new equity shares ₹150/- lakhs – Payment of bank loan of ₹74/- lakhs = ₹206 lakhs.

It is worth mentioning that financial restructuring is unique in nature and is company specific. It is carried out, in practice when all shareholders sacrifice and understand that the restructured firm (reflecting its true value of assets, capital and other significant financial parameters) can now be nursed back to health. This type of corporate restructuring helps in the revival of firms that otherwise would have faced closure/liquidation.

17. Merger Failures or Potential Adverse Competitive Effects

Academic studies indicate that success in creating value through acquisitions in a competitive market is extremely difficult. Jensen and Ruback (1983) highlighted this point by summarising results from mergers and acquisitions over a period of 11 years. They found that in case of a merger, the average return, around the date of announcement, to shareholders of the acquired company is 20 per cent, whereas the average return to the acquiring company is 0 per cent. Another study by McKinsey indicates that 61 per cent of the 116 acquisitions studied were failures, 23 per cent were successes. Despite such statistics why do companies acquire? Why do mergers fail? The reasons for merger failures can be numerous. Some of the key reasons are :

- Acquirers generally overpay;
- The value of synergy is over-estimated;
- Poor post-merger integration; and
- Psychological barriers.

Companies often merge in the fear that the bigger competitors have economies of scale and may destroy them by exercising a stranglehold on raw material supply, distribution etc. What they do not realise is the drawbacks of being big. The acquiring company's executives would

13.42 Strategic Financial Management

have drawn up elaborate plans for the target without consulting its executives which leads to resentment and managerial attrition. This can be avoided by honest discussions with the target company's executives.

Most companies merge with the hope that the benefits of synergy will be realised. Synergy will be there only if the merged entity is managed better after the acquisition than it was managed before. It is the quality of the top management that determines the success of the merger. Quite often the executives of the acquiring company lose interest in the target company due to its smallness. The small company executives get bogged down repairing vision and mission statements, budgets, forecasts, profit plans which were hitherto unheard of. The elaborateness of the control system depends on the size and culture of the company. To make a merger successful:

- Decide what tasks need to be accomplished in the post-merger period;
- Choose managers from both the companies (and from outside);
- Establish performance yardstick and evaluate the managers on that yardstick; and
- Motivate them.

18. Acquiring for Shares

The acquirer can pay the target company in cash or exchange shares in consideration. The analysis of acquisition for shares is slightly different. The steps involved in the analysis are:

- Estimate the value of acquirer's (self) equity;
- Estimate the value of target company's equity;
- Calculate the maximum number of shares that can be exchanged with the target company's shares; and
- Conduct the analysis for pessimistic and optimistic scenarios.

Exchange ratio is the number of acquiring firm's shares exchanged for each share of the selling firm's stock. Suppose company A is trying to acquire company B's 100,000 shares at ₹230. So the cost of acquisition is ₹230,00,000. Company A has estimated its value at ₹200 per share. To get one share of company B, A has to exchange $(230/200)$ 1.15 share, or 115,000 shares for 100,000 shares of B. The relative merits of acquisition for cash or shares should be analysed after giving due consideration to the impact on EPS, capital structure, etc.

Normally when shares are issued in payment to the selling company's shareholders, stockholders will find the merger desirable only if the value of their shares is higher with the merger than without the merger. The number of shares that the buying company will issue in acquiring the selling company is determined as follows:

- (1) The acquiring company will compare its value per share with and without the merger.
- (2) The selling company will compare its value with the value of shares that they would receive from acquiring company under the merger.

- (3) The managements of acquiring company and selling company will negotiate the final terms of the merger in the light of (1) and (2); the ultimate terms of the merger will reflect the relative bargaining position of the two companies.

The fewer of acquiring company's shares that acquiring company must pay to selling company, the better off are the shareholders of acquiring company and worse off are the shareholders of selling company. However, for the merger to be effected, the shareholders of both the buying and selling company will have to anticipate some benefits from the merger.

Impact of Price Earning Ratio: The reciprocal of cost of equity is price-earning (P/E) ratio. The cost of equity, and consequently the P/E ratio reflects risk as perceived by the shareholders. The risk of merging entities and the combined business can be different. In other words, the combined P/E ratio can very well be different from those of the merging entities. Since market value of a business can be expressed as product of earning and P/E ratio ($P/E \times E = P$), the value of combined business is a function of combined earning and combined P/E ratio. A lower combined P/E ratio can offset the gains of synergy or a higher P/E ratio can lead to higher value of business, even if there is no synergy. In ascertaining the exchange ratio of shares due care should be exercised to take the possible combined P/E ratio into account.

Illustration 4

Company X is contemplating the purchase of Company Y, Company X has 3,00,000 shares having a market price of ₹ 30 per share, while Company Y has 2,00,000 shares selling at ₹ 20 per share. The EPS are ₹ 4.00 and ₹ 2.25 for Company X and Y respectively. Managements of both companies are discussing two alternative proposals for exchange of shares as indicated below:

- (i) *in proportion to the relative earnings per share of two companies.*
- (ii) *0.5 share of Company X for one share of Company Y (0.5:1).*

You are required:

- (i) *to calculate the Earnings Per share (EPS) after merger under two alternatives; and*
- (ii) *to show the impact of EPS for the shareholders of two companies under both the alternatives.*

Solution

Working Notes: Calculation of total earnings after merger

Particulars	Company X	Company Y	Total
Outstanding shares	3,00,000	2,00,000	
EPS (₹)	4	2.25	
Total earnings (₹)	12,00,000	4,50,000	16,50,000

- (i) (a) Calculation of EPS when exchange ratio is in proportion to relative EPS of two companies

Company X		3,00,000
Company Y	$2,00,000 \times 2.25/4$	1,12,500
Total number of shares after merger		4,12,500

13.44 Strategic Financial Management

Company X

EPS before merger	=	₹ 4
EPS after merger = ₹ 16,50,000/4,12,500 shares	=	₹ 4

Company Y

EPS before merger	=	₹ 2.25
EPS after merger		
= EPS of Merged Entity after merger x Share Exchange ratio on EPS basis	=	₹ 2.25
= ₹ $4 \times \frac{2.25}{4}$		

(b) Calculation of EPS when share exchange ratio is 0.5 : 1

Total earnings after merger	=	₹ 16,50,000
Total number of shares after merger	=	3,00,000 + (2,00,000 x 0.5)
	=	4,00,000 shares
EPS after merger = ₹ 16,50,000/4,00,000	=	₹ 4.125

(ii) Impact of merger on EPS for shareholders of Company X and Company Y

(a) Impact on Shareholders of Company X

	(₹)
EPS before merger	4.000
EPS after merger	4.125
Increase in EPS	0.125

(b) Impact on Shareholders of Company Y

	(₹)
Equivalent EPS before merger	2.2500
Equivalent EPS after merger	2.0625
Decrease in EPS	0.1875

Illustration 5

A Ltd. is studying the possible acquisition of B Ltd. by way of merger. The following data are available:

Firm	After-tax earnings	No. of equity shares	Market price per share
A Ltd.	₹ 10,00,000	2,00,000	₹ 75
B Ltd.	₹ 3,00,000	50,000	₹ 60

(i) If the merger goes through by exchange of equity shares and the exchange ratio is set according to the current market prices, what is the new earnings per share for A Ltd.?

- (ii) B Ltd. wants to be sure that its earning per share is not diminished by the merger. What exchange ratio is relevant to achieve the objective?

Solution

- (i) The current market price is the basis of exchange of equity shares, in the proposed merger, shareholders of B Ltd. will get only 40,000 shares in all or 4 shares of A Ltd. for every 5 shares held by them, i.e.,

$$\frac{50,000 \times 60}{75} = 40,000$$

The total number of shares in A Ltd. will then be 2,40,000 and, ignoring any synergistic effect, the profit will be ₹ 13,00,000. The new earning per share (EPS) of A Ltd. will be ₹ 5.42, i.e., ₹ 13,00,000/2,40,000.

- (ii) The present earnings per share of B Ltd. is ₹6/- (₹ 3,00,000 ÷ 50,000) and that of A Ltd. is ₹5/-, i.e., ₹ 10,00,000 ÷ 2,00,000. If B Ltd. wants to ensure that, even after merger, the earning per share of its shareholders should remain unaffected, then the exchange ratio will be 6 shares for every 5 shares.

The total number of shares of A Ltd. that will produce ₹ 3,00,000 profit is 60,000, (3,00,000 ÷ 5), to be distributed among, shareholders of B Ltd., giving a ratio of 6 shares in A for 5 shares in B.

Proof:

The shareholders of B Ltd. will get in all 60,000 share for 50,000 shares. It means after merger, their earning per share will be ₹ 5/-, i.e. $\frac{₹13,00,000}{2,60,000}$.

In all they will get ₹3,00,000, i.e., 60,000 x 5, as before.

Illustration 6

Simpson Ltd. is considering a merger with Wilson Ltd. The data below are in the hands of both Board of Directors. The issue at hand is how many shares of Simpson should be exchanged for Wilson Ltd. Both boards are considering three possibilities 20,000, 25,000 and 30,000 shares. You are required to construct a table demonstrating the potential impact of each scheme on each set of shareholders:

		Simpson Ltd.	Wilson Ltd.	Combined Post merger Firm 'A'
1.	Current earnings per year	2,00,000	1,00,000	3,50,000
2.	Shares outstanding	50,000	10,000	?
3.	Earnings per share (₹) (1 ÷ 2)	4	10	?
4.	Price per share (₹)	40	100	?
5.	Price-earning ratio [4 ÷ 3]	10	10	10
6.	Value of firm (₹)	20,00,000	10,00,000	35,00,000
7.	Expected Annual growth rate in earnings in foreseeable future	0	0	0

13.46 Strategic Financial Management

Solution

The following table demonstrates the potential impact of the three possible schemes, on each set of shareholders: -

<i>Number of Simpson Ltd.'s shares issued to shareholders of Wilson Ltd.</i>	<i>Exchange ratio [(1)/10,000 shares of Wilson Ltd.]</i>	<i>Number of Simpson Ltd.'s shares outstanding after merger [50,000+(1)]</i>	<i>Fraction of Simpson Ltd. (Post merger) owned by Wilson Ltd.'s shareholders [(1)/(3)]</i>	<i>Value of shares owned by Wilson Ltd.'s shareholders [(4)x 35,00,000]</i>	<i>Fraction of Simpson Ltd. (combined Post-merger owned by Simpson Ltd.'s shareholders [50,000/(3)]</i>	<i>Value of shares owned by Simpson Ltd.'s shareholders [(6) x 35,00,000]</i>
(1)	(2)	(3)	(4)	(5)	(6)	(7)
20,000	2	70,000	2/7	10,00,000	5/7	25,00,000
25,000	2.5	75,000	1/3	11,66,667	2/3	23,33,333
30,000	3	80,000	3/8	13,12,500	5/8	21,87,500

19. Cross-Border M&A

Cross-border M&A is a popular route for global growth and overseas expansion. Cross-border M&A is also playing an important role in global M&A. This is especially true for developing countries such as India. Kaushik Chatterjee, CFO, of Tata Steel in an interview with McKenzie Quarterly in September 2009 articulates this point very clearly. To the following question

The Quarterly: Last year was the first in which Asian and Indian companies acquired more businesses outside of Asia than European or US multinationals acquired within it. What's behind the Tata Group's move to go global?

His response is as follows:-

"India is clearly a very large country with a significant population and a big market, and the Tata Group's companies in a number of sectors have a pretty significant market share. India remains the main base for future growth for Tata Steel Group, and we have substantial investment plans in India, which are currently being pursued. But meeting our growth goals through organic means in India, unfortunately, is not the fastest approach, especially for large capital projects, due to significant delays on various fronts. Nor are there many opportunities for growth through acquisitions in India, particularly in sectors like steel, where the value to be captured is limited—for example, in terms of technology, product profiles, the product mix, and good management."

Other major factors that motivate multinational companies to engage in cross-border M&A in Asia include the following:

- Globalization of production and distribution of products and services.

- Integration of global economies.
- Expansion of trade and investment relationships on International level.
- Many countries are reforming their economic and legal systems, and providing generous investment and tax incentives to attract foreign investment.
- Privatisation of state-owned enterprises and consolidation of the banking industry.

20. Decade of Corporate Churning and Change

Despite the churning and change that has taken place over the past decade, the corporate sector has still to go a long way in improving its image and become globally competitive. The successes and failures have not been industry-specific but company-specific. But at the macro-level, the overall efficiency of industry has not shown much improvement.

The internal and external liberalisation measures introduced over the last two decades and the dramatic changes that have taken place in the international business environment have had a far-reaching impact on Indian business. The face of Corporate India has changed during the last two decades than in the preceding four decades thanks to the U-turn in the Government's economic policy in 1991.

Major policy changes: The major policy changes introduced since July, 1991 include:

- (a) abolition of industrial licensing;
- (b) lifting of restrictions on the size of firms;
- (c) a drastic reduction in the areas reserved for the public sector;
- (d) disinvestments of Government equity in public sector undertakings (PSUs) aimed at eventual privatisation of most of them;
- (e) liberalisation of foreign investment regulations;
- (f) substantial liberalisation of import tariffs;
- (g) removal of all quantitative restrictions on imports;
- (h) abolition of the office of the Controller of Capital Issues (CC) and freedom to companies to set premia on their share issues;
- (i) freedom to companies to raise capital abroad;
- (j) rationalisation and lowering of excise and Customs duties
- (k) replacing the draconian FERA with FEMA
- (l) a substantial reduction in corporate and personal income tax rates and introduction of total current account convertibility and partial capital account convertibility

In large measure, these reforms met the longstanding demands of the Indian industry to free it from the plethora of controls and regulations, exorbitantly high rates of direct and indirect taxes and severe restrictions on foreign exchange transactions. All the internal liberalisation

13.48 Strategic Financial Management

measures provided greater freedom and opportunities to the Indian companies and entrepreneurs to expand their existing businesses and enter new areas hitherto reserved exclusively for the public sector.

However, the corporate sector was not quite prepared for the other side of reforms, namely, the external liberalisation and the movement towards globalisation, which opened the Indian economy to competition from abroad. Although India was not strictly a closed economy even before the launch of the reforms process, Indian industry was generally insulated from external competition thanks to a variety of import restrictions and high tariff walls, the peak level import duty being some 300 per cent.

Companies are now obliged to offer better quality products at increasingly competitive prices, and their profit margins are constantly under pressure. Under the earlier regime of protection, 'cost-plus' pricing was the norm in most cases. In the majority of cases, it was possible to pass on the burden of higher costs and inefficiencies to the customer by charging a higher price for the product. Today there is a paradigm shift in this equation. No more is the formula "Cost + Profit = Revenue". Presently, the commodity markets (real markets) define the maximum revenue potential and the capital markets (equity, in particular) define the minimum profit requirements. Therefore, the Corporate Managers are not given any leeway other than managing the Costs. This has resulted in yet another paradigm shift from focus on 'Cost Reduction' to 'Cost Management'.

To succeed in the new environment, companies are required to bring:

- New insights into understanding the customer who is becoming increasingly demanding;
- the ability to design, develop and produce new and more customer-friendly products of better quality;
- skills to develop exclusive positions in the minds of the consumer;
- new processes, techniques and technologies to ensure that costs are being continuously reduced,
- ways to restructure organisations so that trained and talented people stay to give their best efforts; and
- considerable funds to invest in marketing and building brand franchises.

Churning and restructuring: It is not surprising, therefore, that the Indian corporate sector is undergoing a process of churning and restructuring. The fortunes of the once renowned family business houses such as the Dalmia-Jain group, Sriram group, Walchands, Thapars, Singhania, Somanis, Wadias, Mafatlals, Khaitans and Modis have witnessed an unprecedented decline. With much erosion in their wealth, they lie scattered because of family splits and mismanagement. However, Mr. Dhirubhai Ambani's Reliance Group has been an exception. It managed to prosper and grow despite all odds by seizing the opportunities provided by liberalisation and globalisation. Reliance Industries is now among the top five companies in the country in terms of market capitalisation.

The decade also witnessed the phenomenal growth of the so-called New Economy companies such as Infosys, Wipro and Bharti Airtel which started creating more wealth than the Tatas and Birlas. Mr. Azim Premji of Wipro and Mr. Narayan Murthy of Infosys are the new breed of entrepreneurs known for very high standards of corporate governance and global outlook.

It must be said to the credit of at least some of the family business houses and leading individual companies that they have not been silent spectators allowing the events to overtake them. For instance, Mr. Ratan Tata has initiated measures since 1998 to restructure the Tata empire with the help of management consultants McKinsey & Co. with a view to eventually reduce the number of companies in the group from the existing 80 to 30 and cut down the portfolio from 25 to just a dozen core businesses.

The restructuring exercises also include financial restructuring— restructuring of debt and equity. Many companies have been retiring the earlier high cost debt with the new low interest bearing loans. The threat of hostile takeovers following the big slump in share values of Old Economy companies has prompted managements to hike their equity stake. Gone are the days when business families could exercise control on the management of companies with a small equity stake, often less than 10 per cent.

Consolidation of market power: While the first wave of mergers and joint ventures was driven primarily by competitive compulsions and as an outcome of business restructuring, of late, the larger and more aggressive companies have been buying out the smaller ones to assume market leadership. Till 1999, the biggest mergers and acquisitions deals were in the FMCG industries that are traditionally intensely competitive and have become more so with the entry of well-known international brands. A classic example of the extensions and consolidation of market power is the Hindustan Lever's acquisition and restructuring spree over the last few years. By 1998, it wrapped up five acquisitions (Tomco, Dollop's, Kwality, Milkfood and Kissan) and effected a host of mergers — Doom Dooma with Brooke Bond, Brooke Bond with Lipton, Pond's with Quest International, and finally Brooke Bond Lipton India Ltd (BBLIL) with Hindustan Lever Ltd (HLL). It acquired a 74 percent stake in Modern Foods and turned it into a profitable venture.

M&As also took place in cement, aluminium, steel, chemicals and pharmaceuticals. Incidentally, one of the biggest mergers in India Inc took place in the telecom sector with BPL Communications and the Birla-Tata-AT&T combine, two of the nation's biggest cellular players, announcing an agreement to merge operations.

Where mergers were not convenient, companies tried to form strategic alliances. Pharmaceutical companies such as Dr. Reddys, Ranbaxy and Lupin Laboratories entered into strategic alliances with some MNCs. Incidentally Ranbaxy itself was acquired by Daiichi-Sankyo of Japan in 2008. Another strategy was to form joint ventures with foreign majors, notably in automobile and consumer durable sectors. Unfortunately, most of these joint ventures did not last long. Some of the prominent joint ventures between Indian and foreign partners, particularly in the high-tech and high capital intensity automobile sectors, failed to mature and the foreign partners assumed full control.

13.50 Strategic Financial Management

Despite the churning and change that has taken place over the last two decades, the Indian corporate sector has still to go a long way in improving its image and become globally competitive. True, there have been notable winners across industries such as HLL, Reliance Industries, Hindalco, Tata Group, Hero Motocorp Asian Paints, Sundram Fasteners, Dr. Reddy's Laboratories, Larsen & Toubro, and the public sector companies BHEL and Punjab Tractors. The successes and failures have not been industry specific but company specific. But at the macro level, the overall efficiency of Indian industry has not shown much improvement.

While there has been some increase in expenditure on R&D and brand building, the Indian companies are still lagging far behind their foreign counterparts. Here again, there are a few exceptions. Naushad Forbes finds two major changes in corporate R&D. One is the emergence of new companies, particularly in the pharma sector, as substantial spenders in R&D.

With India recognising the foreign product patents, companies have begun acquiring innovation capacity. Dr. Reddy's have licensed out their discoveries to MNCs earning fat royalties. Nicholas Piramal bought the R&D laboratory of Hoechst Marion Roussel. Second, and more important, is the change in the character of R&D. While earlier the R&D expenditure was mostly on import substitution and diversification, today a part of it is on reaching the international technological frontier.

Unfortunately, the large public sector and the small-scale industries sector still lagging behind in reforms. Unless the Government is able to push ahead vigorously with reforming these sectors, along with a viable exit policy and labour reforms, they will continue to act as major impediments to competitiveness.