FINANCIAL MANAGEMENT
&
INTERNATIONAL FINANCE

FINAL
GROUP - III
PAPER - 12

STUDY NOTES

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PAPER - 12

FINANCIAL MANAGEMENT AND INTERNATIONAL FINANCE

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SYLLABUS

Paper 12: Financial Management & International Finance
(One Paper: 3 hours: 100 marks)

OBJECTIVES

Understand the scope, goals and objectives of Financial Management. To provide expert knowledge on concepts, methods and procedures involved in using Financial Management for managerial decision-making.

Learning Aims

- Understand and apply theories of financial management
- Identify the options available in financial decisions and using appropriate tools for strategic financial management
- Identify and evaluate key success factors in the financial management for organisation as a whole
- Evaluate strategic financial management options in the light of changing environments and the needs of the enterprise
- Determining the optimal financial strategy for various stages of the life-cycle of the enterprise
- Critically assess the proposed strategies

Skill set required

Level C: Requiring all six skill levels - knowledge, comprehension, application, analysis, synthesis, and evaluation

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1.	Overview of Financial Management	10%
2.	Financial Management Decisions	15%
3.	Financial Analysis & Planning	10%
4.	Operating and Financial Leverages	5%
5.	Financial Strategy	15%
6.	Investment Decisions	15%
7.	Project Management	10%
8.	International Finance	10%
9.	Sources of International Finance	5%
10.	International Monetary and Financial System	5%

1. Overview of Financial Management

- Finance and Related Disciplines
- Scope of Financial Management
- Planning environment
- Key decisions of Financial Management
- Emerging role of finance managers in India
- Earnings distributions policy
- Compliance of regulatory requirements in formulation of financial strategies
- Sources of finance – long term, short term and international
- Exchange rate – risk agencies involved and procedures followed in international financial operations

2. Financial Management Decisions

- Capital structure theories and planning
- Cost of capital
- Designing Capital Structure
- Capital budgeting
- Lease financing
- Working capital management
- Financial services
- Dividend and retention policies
- Criteria for selecting sources of finance, including finance for international investments
- Effect of financing decisions on Balance Sheet and Ratios
- Financial management in public sector
- Role of Treasury function in terms of setting corporate objectives, funds management – national and international
- Contemporary developments – WTO, GATT, Corporate Governance, TRIPS, TRIMS, SEBI regulations as amended from time to time

3. Financial analysis & planning

- Funds flow and cash flow analysis
- Financial ratio analysis -Ratios in the areas of performance, profitability, financial adaptability, liquidity, activity, shareholder investment and financing, and their interpretation.
- Limitations of ratio analysis

- Identification of information required to assess financial performance

- Effect of short-term debt on the measurement of gearing.

4. Operating and financial leverages

- Analysis of operating and financial leverages

- Concept and nature of leverages operating risk and financial risk and combined leverage

- Operating leverage and Cost volume Profit analysis – Earning Before Interest and Tax (EBIT) and Earning Per Share (EPS), indifference point.

5. Financial Strategy

- Financial and Non-Financial objective of different organizations

- Impact on Investment, finance and dividend decisions

- Sources and benefits of international financing

- Alternative Financing strategy in the context of regulatory requirements

- Modeling and forecasting cash flows and financial statements based on expected values for variables – economic and business

- Sensitivity analysis for changes in expected values in the models and forecasts

- Emerging trends in financial reporting

6. Investment Decisions

- Costs, Benefits and Risks analysis for projects

- Linking investment with customer's requirements

- Designing Capital Structure

- The impact of taxation, potential changes in economic factors and potential restrictions on remittance on these calculations

- Capital investment real options

- Venture Capital financing

- Hybrid financing / Instruments

7. Project Management

- Project Identification and Formulation

- Identification of Project opportunities

- Project Selection Consideration and Feasibility Studies

- Project appraisal & Cost Benefit analysis

- Source of Project Finance & Foreign Collaboration

8. International Finance
- Minimization of risk
- Diversification of risk
- Forward and futures
- Forward rate agreements
- Interest rate swaps
- Caps, floors and collars
- Parity theorems
- FDI
- Money market hedge
- Options.

9. Sources of International Finance
- Rising funds in foreign markets and investments in foreign projects
- Forward rate agreements and interest rate guarantees
- Transaction, translation and economic risk, Interest rate parity, purchasing power parity and the Fisher effects
- Foreign Direct Investment

10. International Monetary and Financial System
- Understanding the International Monetary System
- Export and Import Practices
- International Financial Management: Important issues and features, International Capital Market
- International Financial Services and Insurance: Important issues and features

Study Note - 1
OVERVIEW OF FINANCIAL MANAGEMENT

1.1 Finance and Related Discipline

This Section includes :

- **Meaning and Definition of Finance**
- **Meaning and Definition of Financial Management**
- **Finance and Related Disciplines**
    - **Economics**
    - **Accounting**
    - **Production**
    - **Marketing**
    - **Quantitative Methods**
    - **Costing**
    - **Law**
    - **Taxation**
    - **Treasury Management**
    - **Banking**
    - **Insurance**
    - **International Finance**
    - **Information Technology**

INTRODUCTION :

Finance is called "The science of money". It studies the principles and the methods of obtaining control of money from those who have saved it, and of administering it by those into whose control it passes. Finance was a branch of Economics till 1890. Economics is defined as study of the efficient use of scarce resources. The decisions made by business firm in production, marketing, finance and personnel matters form the subject matters of economics.

Finance is the process of conversion of accumulated funds to productive use. It is so intermingled with other economic forces that there is difficulty in appreciating the role it plays.

MEANING AND DEFINITION OF FINANCE :

Howard and Uptron in his book **Introduction to Business Finance** defined, "as that administrative area or set of administrative function in an organization which relate with the arrangement of cash and credit so that the organization may have the means to carry out its objectives as satisfactorily as possible".

In simple terms finance is defined as the activity concerned with the planning, raising, controlling and administering of the funds used in the business. Thus, finance is the activity concerned with the raising and administering of funds used in business.

MEANING AND DEFINITION OF FINANCIAL MANAGEMENT :

Financial management is managerial activity which is concerned with the planning and controlling of the firm's financial resources.

Definitions

Howard and Uptron define financial management "as an application of general managerial principles to the area of financial decision-making".

Weston and Brighem define financial management "as an area of financial decision making, harmonizing individual motives and enterprise goal".

"Financial management is concerned with the efficient use of an important economic resource, namely capital funds" - Solomon Ezra & J. John Pringle.

"Financial management is the operational activity of a business that is responsible for obtaining and effectively utilizing the funds necessary for efficient business operations"- J.L. Massie.

"Financial Management is concerned with managerial decisions that result in the acquisition and financing of long-term and short-term credits of the firm. As such it deals with the situations that require selection of specific assets (or combination of assets), the selection of specific liability (or combination of liabilities) as well as the problem of size and growth of an enterprise. The analysis of these decisions is based on the expected inflows and outflows of funds and their effects upon managerial objectives". - Phillippatus.

Nature of Financial Management

The nature of financial management refers to its relationship with related disciplines like economics and accounting and other subject matters.

The area of financial management has undergone tremendous changes over time as regards its scope and functions. The finance function assumes a lot of significance in the modern days in view of the increased size of business operations and the growing complexities associated thereto.

FINANCE AND OTHER RELATED DISCIPLINES :

Financial management, is an integral part of the over all management, on other disciplines and fields of study like economics, accounting, production, marketing, personnel and quantitative methods. The relationship of financial management with other fields of study is explained as under :

Finance and Other Disciplines

Economics
Responsibility
Financial Accounting —— FINANCE —— Business Finance
Transactional Accounting
Management Accounting

Corporate Finance
Cost Accounting
Accounting
Human Resource Accounting
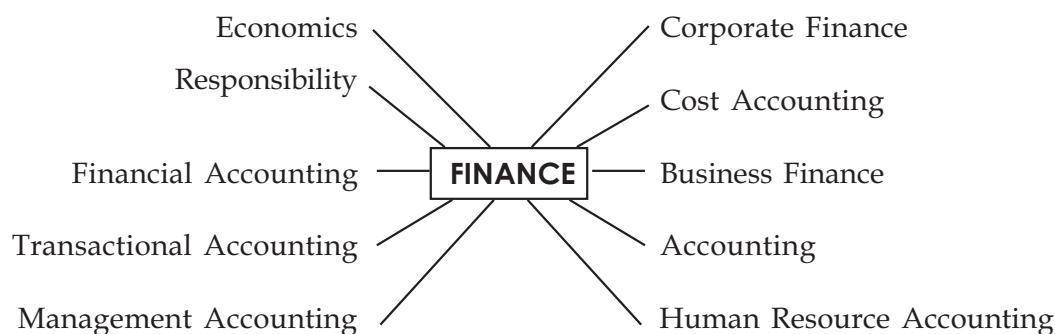
Finance and Economics

Finance is a branch of economics. Economics deals with supply and demand, costs and profits, production and consumption and so on. The relevance of economics to financial management can be described in two broad areas of economics i.e., micro economics and macro economics.

Micro economics deals with the economic decisions of individuals and firms. It concerns itself with the determination of optimal operating strategies of a business firm. These strategies includes profit maximization strategies, product pricing strategies, strategies for valuation of firm and assets etc. The basic principle of micro economics that applies in financial management is marginal analysis. Most of the financial decisions should be made taken into account the marginal revenue and marginal cost. So, every financial manager must be familiar with the basic concepts of micro economics.

Macro economics deals with the aggregates of the economy in which the firm operates. Macro economics is concerned with the institutional structure of the banking system, money and capital markets, monetary, credit and fiscal policies etc. So, the financial manager must be aware of the broad economic environment and their impact on the decision making areas of the business firm.

Finance and Accounting

Accounting and finance are closely related. Accounting is an important input in financial decision making process. Accounting is concerned with recording of business transactions. It generates information relating to business transactions and reporting them to the concerned parties. The end product of accounting is financial statements namely profit and loss account, balance sheet and the statements of changes in financial position. The information contained in these statements assists the financial managers in evaluating the past performance and future direction of the firm (decisions) in meeting certain obligations like payment of taxes and so on. Thus, accounting and finance are closely related.

Finance and Production
Finance and production are also functionally related. Any changes in production process may necessitate additional funds which the financial managers must evaluate and finance. Thus, the production processes, capacity of the firm are closely related to finance.

Finance and Marketing
Marketing and finance are functionally related. New product development, sales promotion plans, new channels of distribution, advertising campaign etc. in the area of marketing will require additional funds and have an impact on the expected cash flows of the business firm. Thus, the financial manager must be familiar with the basic concept of ideas of marketing.

Finance and Quantitative Methods
Financial management and Quantitative methods are closely related such as linear programming, probability, discounting techniques, present value techniques etc. are useful in analyzing complex financial management problems. Thus, the financial manager should be familiar with the tools of quantitative methods. In other way, the quantitative methods are indirectly related to the day-to-day decision making by financial managers.

Finance and Costing
Cost efficiency is a major strategic advantage to a firm, and will greatly contribute towards its competitiveness, sustainability and profitability. A finance manager has to understand, plan and manage cost, through appropriate tools and techniques including Budgeting and Activity Based Costing.

Finance and Law
A sound knowledge of legal environment, corporate laws, business laws, Import Export guidelines, international laws, trade and patent laws, commercial contracts, etc. are again important for a finance executive in a globalized business scenario. For example the guidelines of Securities and Exchange Board of India [SEBI] for raising money from the capital markets. Similarly, now many Indian corporate are sourcing from international capital markets and get their shares listed in the international exchanges. This calls for sound knowledge of Securities Exchange Commission guidelines, dealing in the listing requirements of various international stock exchanges operating in different countries.

Finance and Taxation
A sound knowledge in taxation, both direct and indirect, is expected of a finance manager, as all financial decisions are likely to have tax implications. Tax planning is an important function of a finance manager. Some of the major business decisions are based on the economics of taxation. A finance manager should be able to assess the tax benefits before committing funds. Present value of the tax shield is the yardstick always applied by a finance manager in investment decisions.

Finance and Treasury Management
Treasury has become an important function and discipline, not only in banks, but in every organization. Every finance manager should be well grounded in treasury operations, which is considered as a profit center. It deals with optimal management of cash flows, judiciously investing surplus cash in the most appropriate investment avenues, anticipating and meeting

emerging cash requirements and maximizing the overall returns, it helps in judicial asset liability management. It also includes, wherever necessary, managing the price and exchange rate risk through derivative instruments. In banks, it includes design of new financial products from existing products.

Finance and Banking

Banking has completely undergone a change in today's context. The type of financial assistance provided to corporate has become very customized and innovative. During the early and late 80's, commercial banks mainly used to provide working capital loans based on certain norms and development financial institutions like ICICI, IDBI, and IFCI used to provide long term loans for project finance. But, in today's context, these distinctions no longer exist. Moreover, the concept of development financial institutions also does not exist any longer. The same bank provides both long term and short term finance, besides a number of innovative corporate and retail banking products, which enable corporate to choose between them and reduce their cost of borrowings. It is imperative for every finance manager to be up-to date on the changes in services & products offered by banking sector including several foreign players in the field. Thanks to Government's liberalized investment norms in this sector.

Finance and Insurance

Evaluating and determining the commercial insurance requirements, choice of products and insurers, analyzing their applicability to the needs and cost effectiveness, techniques, ensuring appropriate and optimum coverage, claims handling, etc. fall within the ambit of a finance manager's scope of work & responsibilities.

International Finance

Capital markets have become globally integrated. Indian companies raise equity and debt funds from international markets, in the form of Global Depository Receipts (GDRs), American Depository Receipts (ADRs) or External Commercial Borrowings (ECBs) and a number of hybrid instruments like the convertible bonds, participatory notes etc., Access to international markets, both debt and equity, has enabled Indian companies to lower the cost of capital. For example, Tata Motors raised debt as less than 1% from the international capital markets recently by issuing convertible bonds. Finance managers are expected to have a thorough knowledge on international sources of finance, merger implications with foreign companies, Leveraged Buy Outs (LBOs), acquisitions abroad and international transfer pricing. The implications of exchange rate movements on new project viability have to be factored in the project cost and projected profitability and cash flow estimates. This is an essential aspect of finance manager's expertise. Similarly, protecting the value of foreign exchange earned, through instruments like derivatives, is vital for a finance manager as the volatility in exchange rate movements can erode in no time, all the profits earned over a period of time.

Finance and Information Technology

Information technology is the order of the day and is now driving all businesses. It is all pervading. A finance manager needs to know how to integrate finance and costing with operations through software packages including ERP. The finance manager takes an active part in assessment of various available options, identifying the right one and in the implementation of such packages to suit the requirement.

1.2 Objective & Scope of Financial Management

This Section includes :

- **Objective of Financial Management**
- **Scope of Financial Management**
- **Role of Financial Management**
  - **Liquidity**
  - **Profitability**
  - **Management**
- **Functions**
  - **Investment Decisions**
  - **Financing Decisions**
  - **Dividend Decisions**

INTRODUCTION :

Financial management is that managerial activity which is concerned with the planning and controlling of the firm's financial resources. The funds raised from the capital market needs to be procured at minimum cost and effectively utilised to maximise returns on investments. There is a necessity to make the proper balancing of the risk-return trade off.

OBJECTIVE OF FINANCIAL MANAGEMENT :

Financial Management as the name suggests is management of finance. It deals with planning and mobilization of funds required by the firm. There is only one thing which matters for everyone right from the owners to the promoters and that is money. Managing of finance is nothing but managing of money. Every activity of an organization is reflected in its financial statements. Financial Management deals with activities which have financial implications.

The very objective of Financial Management is to maximize the wealth of the shareholders by maximizing the value of the firm. This prime objective of Financial Management is reflected in the EPS (Earning per Share) and the market price of its shares.

The earlier objective of profit maximization is now replaced by wealth maximization. Since profit maximization is a limited one it cannot be the sole objective of a firm. The term profit is a vague phenomenon and if given undue importance problems may arise whereas wealth maximization on the other hand overcomes the drawbacks of profit maximization. Thus the objective of Financial Management is to trade off between risk and return. The objective of Financial Management is to make efficient use of economic resources mainly capital.

The functions of Financial Management involves acquiring funds for meeting short term and long term requirements of the firm, deployment of funds, control over the use of funds and to trade-off between risk and return.

SCOPE OF FINANCIAL MANAGEMENT :

Financial Management today covers the entire gamut of activities and functions given below. The head of finance is considered to be importantly of the CEO in most organizations and performs a strategic role. His responsibilities include :

a. Estimating the total requirements of funds for a given period.

b. Raising funds through various sources, both national and international, keeping in mind the cost effectiveness;

c. Investing the funds in both long term as well as short term capital needs;

d. Funding day-to-day working capital requirements of business;

e. Collecting on time from debtors and paying to creditors on time;

f. Managing funds and treasury operations;

g. Ensuring a satisfactory return to all the stake holders;

h. Paying interest on borrowings;

i. Repaying lenders on due dates;

j. Maximizing the wealth of the shareholders over the long term;

k. Interfacing with the capital markets;

l. Awareness to all the latest developments in the financial markets;

m. Increasing the firm's competitive financial strength in the market; and

n. Adhering to the requirements of corporate governance.

ROLE OF FINANCIAL MANAGEMENT :

- To participate in the process of putting funds to work within the business and to control their productivity; and

- To identify the need for funds and select sources from which they may be obtained.

The functions of financial management may be classified on the basis of liquidity, profitability and management.

1. Liquidity

Liquidity is ascertained on the basis of three important considerations:

a. Forecasting cash flows, that is, matching the inflows against cash outflows;

b. Raising funds, that is, financial management will have to ascertain the sources from which funds may be raised and the time when these funds are needed;

c. Managing the flow of internal funds, that is, keeping its accounts, with a number of banks to ensure a high degree of liquidity with minimum external borrowing.

2. Profitability

While ascertaining profitability, the following factors are taken into account:

a. Cost control : Expenditure in the different operational areas of an enterprise can be analysed with the help of an appropriate cost accounting system to enable the financial manager to bring costs under control.

b. Pricing : Pricing is of great significance in the company's marketing effort, image and sales level. The formulation of pricing policies should lead to profitability, keeping, of course, the image of the organization intact.

c. Forecasting Future Profits : Expected profits are determined and evaluated. Profit levels have to be forecast from time to time in order to strengthen the organization.

    d. Measuring Cost of Capital: Each source of funds has a different cost of capital which must be measured because cost of capital is linked with profitability of an enterprise.

3. Management

The financial manager will have to keep assets intact, for assets are resources which enable a firm to conduct its business. Asset management has assumed an important role in financial management. It is also necessary for the financial manager to ensure that sufficient funds are available for smooth conduct of the business. In this connection, it may be pointed out that management of funds has both liquidity and profitability aspects. Financial management is concerned with the many responsibilities which are thrust on it by a business failures, financial failures do positively lead to business failures. The responsibility of financial management is enhanced because of this peculiar situation. Financial management may be divided into two broad areas of responsibilities, which are not by any means independent of each other. Each, however, may be regarded as a different kind of responsibility; and each necessitates very different considerations. These two areas are:

- The management of long-term funds, which is associated with plans for development and expansion and which involves land, buildings, machinery, equipment, transport facilities, research project, and so on;
- The management of short-term funds, which is associated with the overall cycle of activities of an enterprise. These are the needs which may be described, as working capital needs.

FUNCTIONS OF FINANCIAL MANAGEMENT :

The modern approach to the financial management is concerned with the solution of major problems like investment financing and dividend decisions of the financial operations of a business enterprise. Thus, the functions of financial management can be broadly classified into three major decisions, namely:

    (a) Investment decisions,

    (b) Financing decisions,

    (c) Dividend decisions.

The functions of financial management are briefly discussed as under:

1. Investment Decision

The investment decision is concerned with the selection of assets in which funds will be invested by a firm. The assets of a business firm includes long term assets (fixed assets) and short term assets (current assets). Long term assets will yield a return over a period of time in future whereas short term assets are those assets which are easily convertible into cash within an accounting period i.e. a year. The long term investment decision is known as capital budgeting and the short term investment decision is identified as working capital management. Capital Budgeting may be defined as long – term planning for making and financing proposed capital outlay. In other words Capital Budgeting means the long-range planning of allocation of funds among the various investment proposals. Another important element of capital budgeting decision is the analysis of risk and uncertainty. Since, the return on the investment proposals can be derived for a longer time in future, the capital budgeting decision should be evaluated in relation to the risk associated with it.

On the other hand, the financial manager is also responsible for the efficient management of current assets i.e. working capital management. Working capital constitutes an integral part of financial management. The financial manager has to determine the degree of liquidity that a firm should possess. There is a conflict between profitability and liquidity of a firm. Working capital management refers to a trade – off between liquidity (Risk) and profitability. Insufficiency of funds in current assets results liquidity and possessing of excessive funds in current assets reduces profits. Hence, the finance manager must achieve a proper trade – off between liquidity and profitability. In order to achieve this objective, the financial manager must equip himself with sound techniques of managing the current assets like cash, receivables and inventories etc.

2. Financing Decision

The second important function is financing decision. The financing decision is concerned with capital – mix, financing – mix or capital structure of a firm. The term capital structure refers to the proportion of debt capital and equity share capital. Financing decision of a firm relates to the financing – mix. This must be decided taking into account the cost of capital, risk and return to the shareholders. Employment of debt capital implies a higher return to the share holders and also the financial risk. There is a conflict between return and risk in the financing decisions of a firm. So, the financial manager has to bring a trade – off between risk and return by maintaining a proper balance between debt capital and equity share capital. On the other hand, it is also the responsibility of the financial manager to determine an appropriate capital structure.

3. Dividend Decision

The third major function is the dividend policy decision. Dividend policy decisions are concerned with the distribution of profits of a firm to the shareholders. How much of the profits should be paid as dividend? i.e. dividend pay-out ratio. The decision will depend upon the preferences of the shareholder, investment opportunities available within the firm and the opportunities for future expansion of the firm. The dividend pay out ratio is to be determined in the light of the objectives of maximizing the market value of the share. The dividend decisions must be analysed in relation to the financing decisions of the firm to determine the portion of retained earnings as a means of direct financing for the future expansions of the firm.
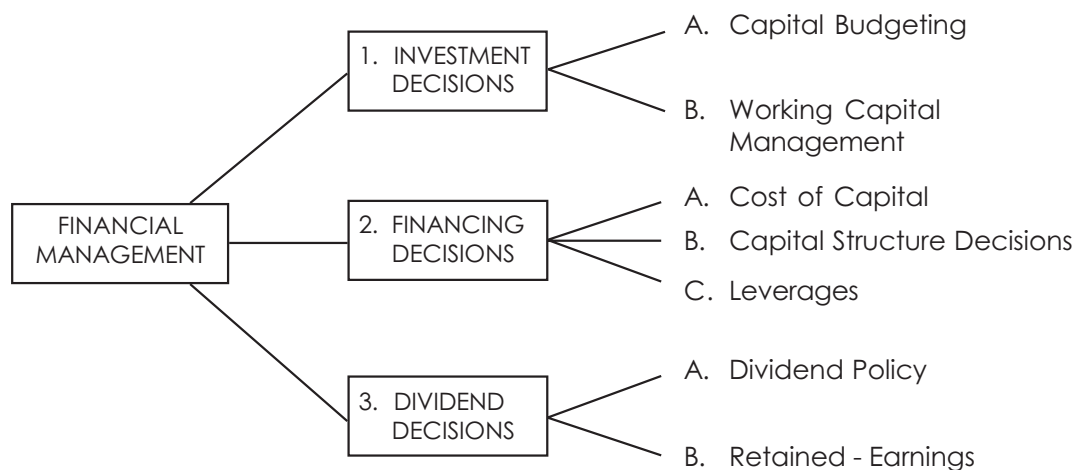
1.3 Planning Environment

This Section includes :

- **Steps in Financial Planning**
  - **Establishing Objectives**
  - **Policy formulation**
  - **Forecasting**
  - **Formulation of procedures**
- **Characteristics of Financial Planning**
- **Computerized Financial Forecasting and Planning Models**
- **Limitations of Financial Planning**

INTRODUCTION :

Financial planning involves analyzing the financial flows of a company, forecasting the consequences of various investment, financing and dividend decisions and weighing the effects of various alternatives. The idea is to determine where the firm has been, where it is now and where it is heading – not only the most likely course of events, but deviation from the most likely outcome. The advantage of financial planning is that it forces management to take account of possible deviation from the company's anticipated path.

The aim in financial planning should be to match the needs of the company with those of the investors with a sensible gearing of short-term and long-term fixed interest securities. Financial planning aims at the eliminations of waste resulting from complexity of operation. For e.g. – technological advantage, higher taxes, fluctuations of interest rates etc. Financial planning helps to avoid waste by providing policies and procedures, which make possible a closer co-ordination between various functions of the business enterprise. A firm, which performs no financial planning, depends upon past experience for the establishment of its objectives, policies and procedures.

It may be summarized that financial planning should:-

- Determine the financial resources required in meeting the company's operating program.

- Forecast the extent to which these requirements will be met by internal generation of funds and to what extent they will be met from external sources.

- Develop the best plans to obtain the required external funds.

- Establish and maintain a system of financial control governing the allocation and use of funds.

- Formulate programs to provide the most effective cost - volume - profit relationship.

- Analyze the financial results of operation.

- Report the facts to the top management and make recommendations on future operations of the firm.

STEPS IN FINANCIAL PLANNING :

- Establishing Objectives
- Policy Formulation
- Forecasting
- Formulation of Procedures

Establishing objectives

The financial objective of any business enterprise is to employ capital in whatever proportion necessary and to increase the productivity of the remaining factors of production over the long run. Although the extent to which the capital is employed varies from firm to firm, but the overall objective is identical in all firms. Business enterprise operates in a dynamic society, and in order to take advantage of changing economic conditions, financial planners should establish both short term and long term objectives. The long-term goal of any firm is to use capital in correct proportion.

The objectives of the company are sometimes revealed in the vision statement of the company. The chieftains of the companies know it very well that in today's world, innovation and adaptation is crucial to be successful in the dynamic market. The impact of innovation on key value drivers also has to be examined to remain in the forefront in the industry. While establishing the objectives, the innovation and the value-driver should be clearly stated.

Constant innovation and adaptation of key business processes is assuming increasing importance in establishing the objective of the company. As companies seek to innovate, they can be slotted into one of the three strategic positions :

(i) Product Innovator

Manufacturing companies that focus primarily on products and services fall into this category. They seek to gain the competitive advantage by improving their product and service attributes. A company that is a new entrant into the market normally comes up with an "innovative" idea in product development. Some of these ideas pay off in terms of high profit margins, while others may have to be reworked to become money-spinners. For attaining a sustainable advantage, continuous improvement should be targeted at the following value drivers:

- Product development—Innovation is considered a major component in the product development life cycle. Innovative ideas generated during informal brainstorming sessions in startup companies, or at formal meetings in mature companies are crucial to create a commercially viable product. These ideas also help to improve business processes, technologies and investments.

- The name— If a company introduces an "innovative" product in the market, but the brand name of the new offering fails to differentiate it from earlier versions or the offerings of competitors, the benefits of innovation are not realized. Innovation must be integrated into the brand name so that it is indicative of being a unique or superior product.

- Distribution channels— Companies can offer their products/services through a network of channels. The choice of the right distribution channel would determine the product's acceptance and success. It is important for companies to select new and

innovative distribution channels in today's 'borderless' world, rather than persist with traditional channels. Such channels would strengthen the company's offering to the final customer.

Unilever, a multinational manufacturer of foods, home and personal care products exemplifies innovation in the product innovator position. Through constant innovation, the company has brought out several well-known products like Lipton tea, Hellman's manyonnaise and Calvin Klein perfumes in the span of two years only. The company uses a formal innovation process to generate new ideas from all employees across the board.

Hindusthan Lever in India is a company in the category of "product innovator". After dominating the detergent market for a period of more than 35 years, in the post liberalization period they faced fierce competition from Nirma, Ariel of Proctor and Gamble, Henko of Henkel. They invested heavily in research in the detergent market. The brand 'Surf' changed its identity from time to time ("power packed Surf", "Surf International", "Surf with wash booster", "Surf Excel", etc.)

(ii) Value Network Architect

Companies in this category seek to enhance shareholder value by utilizing resources of the entire business network to their advantage. Some companies strategically position themselves to create value. Therefore, adaptation and positioning are important, and innovative ways of doing so would indicate their chances of success. To make a mark in this niche, managers must seek innovative ways of identifying profit zones and positioning the company. Similarly, there must be continuous effort across the board to come up with innovative ways to forge ahead in relevant business processes. Such efforts include identifying best practices and core activities of competitors; and adapting and capitalizing on them.

The Airlines companies thrive on value networking. The Indian companies in the private sector (Sahara India, Jet Airways) have identified their profitable sectors and maximizing value by giving discounts on ticket-price. At the same time they offer better quality service.

(iii) Relationship Owner

Companies that focus on increasing shareholder value by establishing and improving relationships with various network players fit into this position.

Innovation is key to such businesses and market leadership can be gained by anticipating customer requirements, before customers realize it or competitors provide it. Innovative techniques can be used to gain an insight into customers businesses, and their purchasing power and patterns; thereafter production and distribution strategies can be formulated.

For instance, Amazon.com encourages innovative thinking to establish good relations with its customers. Though the company has worldwide operations, it personalizes its products and services and ensures prompt delivery. Besides, maintaining good relations with its customers, Amazon.com monitors all activities of the supply chain to gain cost efficiency. The relationship owner should be wary if competitors offer a wide range of products, for it gives the competitor a wider platform to establish a bond with customers.

Policy Formulation

Financial policies are guides to all actions, which deal with procuring, administering and disbursing the funds of business firms. The policies may be classified into several broad categories :

- Policies governing the amount of capital required for firms to achieve their financial objective.
- Policies which determine the control by the parties who furnish the capital.
- Policies which act as a guide in the use of debt or equity capital.
- Policies which guide management in the selection of sources of funds.
- Policies which govern credit and collection activities of the enterprise.

Forecasting

A fundamental requisite of financial planning is the collection of facts, however where financial plans concern the future, "facts" are not available. Therefore financial management is required to forecast the future in order to predict the variability of factors influencing the type of policies formulate.

Formulation of Procedures

Financial policies are broad guides which to be executed properly, must be translated into detailed procedures. This helps the financial manager to put planned activities into practice.

The objective setting and forecasting may be done by considering some facts and figures. But formulation of procedure is the backbone of procurement, operation, distribution, logistics and collection from debtors. It is a complex flowchart involving all possible options.

CHARACTERISTICS OF FINANCIAL PLANNING :

• Simplicity of purpose

The planning schedule should be organized and should be as simple as possible so that the understanding of it becomes easier.

• Intensive Use

A wasteful use of capital is almost as bad as inadequate capital. A financial plan should be such that it will provide for an intensive use of funds. Funds should not remain idle, nor should there be any paucity of funds. Moreover, they should be made available for the optimal utilization of projects.

• Financial contingency

In fact, planning, as it is commonly practiced today, tends to build in rigidities, which work against a quick and effective response to the unexpected event. Contingency planning or a strategy for financial mobility should be brought into the open for a careful review. Every business has objectives that guide policy in their most basic form and include survival, profitability and growth. Growth objectives that are central to our philosophy of successful management may be expressed in a variety of ways – sales, profits, market share, geographical coverage and product line; but they are all contingent on a continuous flow of funds which make it possible for the management to implement decisions. Financial contingency planning is a strategy, which a firm adopts in situations of adversity.

• Objectivity

The figures and reports to be used for a financial plan should be free from partiality, prejudice and personal bias. A lapse from objectivity is undesirable as it may mislead and make it difficult if not impossible for a firm to prepare a fact-finding plan.

- **Comparisons**

Figures and reports should be expressed in terms of standards of performance. Financial executives often take initiative decisions based upon their personal judgments. These decisions are subjective. If standards of performance, including those of past performance, are expressed, the subjective element, which is likely to creep into a financial plan, can be eliminated.

- **Flexibility**

The financial plan should be such that it can be made flexible, so that it can be modified or changed, if it is necessary to do so. Making provisions for valuable or convertible securities can do this. It would be better to avoid restrictive or binding provisions in debentures and preferred stock. Flexible sinking fund position may be introduced in debenture financing. The environment of a firm may change from time to time. It is therefore advisable to have a more versatile plan than a routine one.

- **Profitability**

A financial plan should maintain the required proportion between fixed charge obligations and the liabilities in such a manner that the profitability of the organization is not adversely affected. The most crucial factor in financial planning is the forecasting of sales, for sales almost invariably represent the primary source of income and cash receipts. Besides, the operation of the business is geared to the anticipated volume of sales. The management should recognize the likely margins of error inherent in forecasts, and this recognition would enable the management to avoid the hazards involved in attaching a false accuracy to forecast data based on tenuous assumptions.

- **Maneuverability**

Maneuverability is the direct result of a management's adherence to the financial structure which is acceptable to the business community; that is creditors, shareholders, bankers, etc. It is necessary to choose a financial plan, which may control the crisis, the crisis that may develop from time to time. It is well known that any financial plan should aim at a proper balance between debt and equity. This is essential to ensure that the stake of the entrepreneur in an industry or a concern is substantial, so that his handling of the affairs, financial and others may be in its best interest.

- **Risks**

There are different types of risks but the financial manager is more concerned about the financial risk which is created by a high debt-equity ratio than about any other risk. If earnings are high, the financial risk may not have much of an impact. In other words if the economic risks of the business activities are reduced to minimum, a firm may not be exposed to financial risks. Its refinancing should be planned in such a manner that the impact of risk is not seriously felt.

Planning is essential for any business operations so that the capital requirement may be assessed as accurately as possible. A plan should be such that it should serve a practical purpose. It should be realistic and capable of being put to intensive use. But a proper balance between fixed and working capital should be maintained.

COMPUTERIZED FINANCIAL FORECASTING AND PLANNING MODELS :

Recently many companies have spent considerable amounts of time and money developing models to represent various aspects of their financial planning process. These representations are computerized and are generally called financial planning models.

Financial planning models are often classified according to whether they are deterministic or probabilistic and whether they attempt to optimize the value of some objective function viz. net income and stock price.

- **Deterministic model**

This model gives a single number forecast of a financial variable or variables without stating anything about the probability of occurrence. For example a budget simulator company that employ budget simulators, enter estimated further revenues and expenses into the computer and receive as output an estimate of various financial variables, such as net income and earning per share. The model tells nothing about the chances of achieving these estimates, nor does it indicate whether the company will be able to manage its resource in such a way to attain higher levels of these variables.

- **Probabilistic model**

This model is becoming increasingly popular because they often provide financial decision makers with more useful information than other models. Though deterministic model yield single-point estimate, probabilistic model yield more general probability distribution.

- **Optimization model**

This model determines the values of financial decision variables that optimize (maximize or minimize), some objective function such as profit or cost. For example consider an oil refinery whose capacity and production costs are known. By combining these known figures with estimates of the sales price for gasoline and heating fuel, it is possible, with the use of an optimization model to specify what output product mix will achieve an optimal level of operating income. Optimization models are not used widely in finance, even though various applications have been proposed in the financial literature.

LIMITATION OF FINANCIAL PLANNING :

Plans are decisions and decisions require facts. Facts about the future are non-existent; consequently, assumptions concerning the future must be substituted. Since future conditions cannot be forecasted accurately, the adaptability of plan is seriously limited. This is true for plans, which cover several years in advance, since reliability of forecasting decreases with time. On the other hand, plans, which cover a relatively short period, such as interest rates, and general business conditions can be predicted with a good degree of accuracy. One way to offset the limitations imposed by management's inability to forecast future condition is to improve their forecasting techniques. Another way to overcome this limitation is to revise plans periodically. The development of variable plans, which take into account changing conditions, will go a long way in eliminating this limitation. Variable budgets are examples of variable plans. Another serious difficulty in planning is the reluctance or inability of the management to change a plan once it has been made. There are several reasons for this. First, plans relating to capital expenditure often involve colossal expenditure and commitments for funds are made months in advance and cannot be readily changed. Second, in addition to advance arrangements regarding capital, management often makes commitments for raw material and equipment prior to the time when the plan is to be initiated. Third, management personnel are psychologically against change, which creates rigidity. Financial planning is limited when there is lack of coordination among the personnel. Financial planning affects each function in the organization, and to be effective, each function should be coordinated in order to ensure consistency in action.

1.4 Key Decisions of Financial Management

This Section includes :

- **FUNCTIONAL AREAS OF FINANCIAL MANAGEMENT**
  - **Determining the financial needs**
  - **Determining the sources of Funds**
  - **Financial Analysis**
  - **Optimum Capital Structure**
  - **C V P Analysis**
  - **Profit Planning and Control**
  - **Fixed Assets Management**
  - **Project Planning and evaluation**
  - **Capital Budgeting**
  - **Working Capital**
  - **Dividend Policies**
  - **Acquisitions and Mergers**
  - **Corporate taxation**

INTRODUCTION :

One of the most important functions of the financial manager is to ensure availability of adequate financing. Financial needs have to be assessed for different purposes. Money may be required for initial promotional expenses, fixed capital and working capital needs. Promotional expenditure includes expenditure incurred in the process of company formation. Fixed assets needs depend upon the nature of the business enterprise – whether it is a manufacturing, non-manufacturing or merchandising enterprise. Current asset needs depend upon the size of the working capital required by an enterprise.

FUNCTIONAL AREAS OF FINANCIAL MANAGEMENT
- Determining Financial Needs
- Determining Sources of Funds
- Financial Analysis
- Optimal Capital Structure
- Cost Volume Profit Analysis
- Profit Planning and Control
- Fixed Assets Management
- Project Planning and Evaluation
- Capital Budgeting
- Working Capital Management
- Dividend Policies
- Acquisitions and Mergers
- Corporate Taxation

Fig : Functional areas of financial management

(i) Determining Sources of Funds

The financial manager has to choose sources of funds. He may issue different types of securities and debentures. He may borrow from a number of financial institutions and the public. When a firm is new and small and little known in financial circles, the financial manager faces a great challenge in raising funds. Even when he has a choice in selecting sources of funds, that choice should be exercised with great care and caution. A firm is committed to the lenders of finance and has to meet terms and conditions on which they offer credit. To be precise, the financial manager must definitely know what he is doing.

(ii) Financial Analysis

It is the evaluation and interpretation of a firm's financial position and operations, and involves a comparison and interpretation of accounting data. The financial manager has to interpret different statements. He has to use a large number of ratios to analyse the financial status and activities of his firm. He is required to measure its liquidity, determine its profitability, and assess overall performance in financial terms. This is often a challenging task, because he must understand importance of each one of these aspects to the firm; and he should be crystal clear in his mind about the purposes for which liquidity, profitability and performance are to be measured.

(iii) Optimal Capital Structure

The financial manager has to establish an optimum capital structure and ensure the maximum rate of return on investment. The ratio between equity and other liabilities carrying fixed charges has to be defined. In the process, he has to consider the operating and financial leverages of his firm. The operating leverage exists because of operating expenses, while financial leverage exists because of the amount of debt involved in a firm's capital structure. The financial manager should have adequate knowledge of different empirical studies on the optimum capital structure and find out whether, and to what extent, he can apply their findings to the advantage of the firm.

(iv) Cost-Volume-Profit Analysis

This is popularly known as the 'CVP relationship'. For this purpose, fixed costs, variable costs and semi-variable costs have to be analysed. Fixed costs are more or less constant for varying sales volumes. Variable costs vary according to sales volume. Semi-variable costs are either fixed or variable in the short run. The financial manager has to ensure that the income for the firm will cover its variable costs, for there is no point in being in business, if this is not accomplished. Moreover, a firm will have to generate an adequate income to cover its fixed costs as well. The financial manager has to find out the break-even-point-that is, the point at which total costs are matched by total sales or total revenue. He has to try to shift the activity of the firm as far as possible from the break-even point to ensure company's survival against seasonal fluctuations.

(v) Profit Planning and Control

Profit planning and control have assumed great importance in the financial activities of modern business. Economists have long considered the importance of profit maximization in influencing business decisions. Profit planning ensures attainment of stability and growth. In view of the fact that earnings are the most important measure of corporate performance, the profit test is constantly used to gauge success of a firm's activities. Profit planning is an important responsibility of the financial manager. Profit is the surplus which accrues to a firm after its total expenses are deducted from its total revenue. It is necessary to determine profits properly, for they measure the economic viability of a business. The first element in profit is revenue or income. This revenue may be from sales or it may be operating revenue, investment income or income from other sources. The second element in profit calculation is expenditure. This expenditure may include manufacturing costs, trading costs, selling costs, general administrative costs and finance costs. Profit planning and control is a dual function which enables management to determine costs it has incurred, and revenues it has earned, during a particular period, and provides shareholders and potential investors with information about the earning strength of the corporation. It should be remembered that though the measurement of profit is not the only step in the process of evaluating the success or failure of a company, it is nevertheless important and needs careful assessment and recognition of its relationship to the company's progress. Profit planning and control are important be, in actual practice, they are directly related to taxation. Moreover, they lay foundation of policies which determine dividend, and retention of profit and surplus of the company. Profit planning and control are an inescapable responsibility of the management. The break-even analysis and the CVP relationship are important tools of profit planning and control.

(vi) Fixed Assets Management

A firm's fixed assets are land, building, machinery and equipment, furniture and such intangibles as patents, copyrights, goodwill, and so on. The acquisition of fixed assets involves capital expenditure decisions and long-term commitments of funds. These fixed assets are justified to the extent of their utility and / or their productive capacity. Because of this long-term commitment of funds, decisions governing their purchase, replacement, etc., should be taken with great care and caution. Often, these fixed assets are financed by issuing stock, debentures, long-term borrowings and deposits from public. When it is not worthwhile to purchase fixed assets, the financial manager may lease them and use assets on a rental basis. To facilitate replacement to fixed assets, appropriate depreciation on fixed assets has to be formulated. It is because of these facts that management decision on the acquisition of fixed assets are vital; if they are ill-designed they may lead to over-capitalisation. Moreover, in view of the fact that fixed assets are maintained over a long period of time, the assets exposed to changes in their value, and these changes may adversely affect the position of a firm.

(vii) Project Planning and Evaluation

A substantial portion of the initial capital is sunk in long-term assets of a firm. The error of judgement in project planning and evaluation should be minimized. Decisions are taken on the basis of feasibility and project reports, containing analysis of economic, commercial,

technical, financial and organizational viabilities. Essentiality of a project is ensured by technical analysis. The economic and commercial analysis study demand position for the product. The economy of size, choice of technology and availability of factors favouring a particular industrial site are all considerations which merit attention in technical analysis. Financial analysis is perhaps the most important and includes forecast of cash in-flows and total outlay which will keep down cost of capital and maximize rate of return on investment. The organizational and man-power analysis ensures that a firm will have the requisite manpower to run the project. In this connection, it should be remembered that a project is exposed to different types of uncertainties and risks. It is, therefore, necessary for a firm to gauge the sensitivity of the project to the world of uncertainties and risks and its capacity to withstand them. It would be unjustifiable to accept even the most profitable project if it is likely to be the riskiest.

(viii) Capital Budgeting

Capital budgeting decisions are most crucial; for they have long-term implications. They relate to judicious allocation of capital. Current funds have to be invested in long-term activities in anticipation of an expected flow of future benefits spread over a long period of time. Capital budgeting forecasts returns on proposed long-term investments and compares profitability of different investments and their cost of capital. It results in capital expenditure investment. The various proposal ranked on the basis of such criteria as urgency, liquidity, profitability and risk sensitivity. The financial analyser should be thoroughly familiar with such financial techniques as pay back, internal rate of return, discounted cash flow and net present value among others because risk increases when investment is stretched over a long period of time. The financial analyst should be able to blend risk with returns so as to get current evaluation of potential investments.

(ix) Working Capital Management

Working capital is rightly an adjunct of fixed capital investment. It is a financial lubricant which keeps business operations going. It is the life-blood of a firm. Cash, accounts receivable and inventory are the important components of working capital, which is rotating in its nature. Cash is the central reservoir of a firm and ensures liquidity. Accounts receivables and inventory form the principal utility of production and sales; they also represent liquid funds in the ultimate analysis. The financial manager should weigh the advantage of customer trade credit, such as increase in volume of sales, against limitations of costs and risks involved therein. He should match inventory trends with level of sales. The uncertainties of inventory planning should be dealt with in a rational manner. There are several costs and risks which are related to inventory management. The risks are there when inventory is inadequate or in excess of requirements. The former may hold up production, while the latter would result in an unjustified locking up of funds and increase the cost of capital. Inventory management entails decisions about the timing and size of purchases purely on a cost basis. The financial manager should determine the economic order quantities after considering the relationships of different cost elements involved in purchases. Firms cannot avoid making investments in inventory because production and deliveries involve time lags and discontinuities. Moreover,

the demand for sales may vary substantially. In the circumstances, safety levels of stocks should be maintained. Inventory management thus includes purchases management and material management as well as financial management. Its close association with financial management primarily arises out of the fact that it is a simple cash asset.

(x) Dividend Policies

Dividend policies constitute a crucial area of financial management. While owners are interested in getting the highest dividend from a corporation, the Board of Directors may be interested in maintaining its financial health by retaining the surplus to be used when contingencies arise. A firm may try to improve its internal financing so that it may avail itself of benefits of future expansion. However, the interests of a firm and its stockholders are complementary, for the financial management is interested in maximizing the value of the firm, and the real interest of stockholders always lies in the maximization of this value of the firm; and this is the ultimate goal of financial management. The dividend policy of a firm depends on a number of financial considerations, the most critical among them being profitability. Thus, there are different dividend policy patterns which a firm may choose to adopt, depending upon their suitability for the firm and its stockholders.

(xi) Acquisitions and Mergers

Firms may expand externally through co-operative arrangements, by acquiring other concerns or by entering into mergers. Acquisitions consist of either the purchase or lease of a smaller firm by a bigger organization. Mergers may be accomplished with a minimum cash outlay, though these involve major problems of valuation and control. The process of valuing a firm and its securities is difficult, complex and prone to errors. The financial manager should, therefore, go through a valuation process very carefully. The most difficult interest to value in a corporation is that of the equity stockholder because he is the residual owner.

(xii) Corporate Taxation

Corporate taxation is an important function of the financial management, for the former has a serious impact on the financial planning of a firm. Since the corporation is a separate legal entity, it is subject to an income-tax structure which is distinct from that which is applied to personal income.

1.5 Emerging Role of Finance Managers

This Section includes :

- **Role of the Finance Manager**

INTRODUCTION :

There are two essential aspects of finance function – one, procurement of funds and two, an effective utilization of these funds in the business. In respect of these two aspects, the role of the finance manager is described below :

ROLE OF THE FINANCE MANAGER :

The traditional role of the finance manager is to confine to the raising of funds in order to meet operating requirements of the business. This traditional approach has been criticized by modern scholars on the following grounds. It was prevalent till the mid-1950s.

1. The traditional approach of raising funds alone is too narrow and thus it is outsider-looking-in approach.
2. It viewed finance as a staff specialty.
3. It has little concern how the funds are utilized.
4. It over-emphasized episodic events and non-recurring problems like the securities and its markets, incorporation, merger, consolidation, reorganization, recapitalization and liquidation etc.
5. It ignored the importance of working capital management.
6. It concentrated on corporate finance only and ignored the financial problems of sole trader and partnership firms.
7. Traditional approach concentrated on the problems of long-term financing and ignored the problems of short-term financing.

There was a change from traditional approach to the modern concept of finance function since the mid-1950s. the industrialization, technological innovations and inventions and a change in economic and environment factors since the mid-1950s necessitated the efficient and effective utilization of financial resources. Since then, finance has been viewed as an integral part of the management. The finance manager is, therefore, concerned with all financial activities of planning, raising, allocating and controlling the funds in an efficient manner. In addition, profit planning is another important function of the finance manager. This can be done by decision making in respect of the following areas:

1. Investment Decisions for obtaining maximum profitability after taking the time value of the money into account.
2. Financing decisions through a balanced capital structure of Debt-Equity ratio, sources of finance, EBIT/EPS computations and interest coverage ratio etc.
3. Dividend decisions, issue of Bonus Shares and retention of profits with objective of maximization of market value of the equity share.
4. Best utilization of fixed assets.
5. Efficient working capital management (inventory, debtors, cash marketable securities and current liabilities).
6. Taking the cost of capital, risk, return and control aspects into account.
7. Tax administration and tax planning.
8. Pricing, volume of output, product-mix and cost-volume-profit analysis (CVP Analysis).
9. Cost control.
10. Stock Market— Analyse the trends in the stock market and their impact on the price of Company's share and share buy-back.

1.6 Earnings Distribution Policy

This Section includes :

- **Meaning of Earning Distribution**
- **Considerations while distributing the earnings**

INTRODUCTION :

The earnings which are distributed to shareholders is referred as Dividend. It is the reward of the shareholders for investments made by them in the shares of the company. The investors are interested in earning the maximum return on their investments and to maximize their wealth. A company, on the other hand, needs to provide funds to finance its long-term growth.

MEANING OF EARNING DISTRIBUTION :

If a company pays out as dividend most of what it earns, then for business requirements and further expansion it will have to depend upon outside resources such as issue of debt or new shares. Dividend policy of a firm, thus affects both the long-term financing and the wealth of shareholders. As a result, the firm's decision to pay dividends must be reached in such a manner so as to equitably apportion the distributed profits and retained earnings becomes possible. Since dividend is a right of shareholders to participate in the profits and surplus of the company for their investment in the share capital of the company, they should receive fair amount of the profits. The company should, therefore, distribute a reasonable amount as dividends (which should include a normal rate of interest plus a return for the risks assumed) to its members and retain the rest for its growth and survival.

CONSIDERATIONS WHILE DISTRIBUTING THE EARNINGS :

A firm takes into account the following consideration to determine the appropriate dividend policy :

- **Investment opportunities**

    Firms, which have substantial investment opportunities generally, tend to maintain low pay out ratio, to conserve resources for growth. On the other hand, firms, which have limited avenues, often usually permit more generous payout ratio.

- **Liquidity**

    Payment of dividend is largely dictated by the amount of cash available certainly this is what Modigliani & Miller suggest should be the case. On the other hand, if failure to pay the dividend is interrupted adversely by the capital market, the best interest of the shareholder's wealth might be advanced by making sure that cash is available for payment of dividend, by borrowing or by passing up otherwise beneficial investment opportunities.

- **Control**

  External financing unless through rights issue, lead to dilution of control. Thus, if major holders are averse to dilution of control, the company tends to rely more on retained earnings and maintain low payout ratio.

- **Clientele effect**

  The clientele effect shows that a company's dividend policy may depend on the "preferred habits" of the majority shareholders. If the dividend policy of a company is not consistent with the preferences of majority shareholders many investors would want to dispose off their holdings in the company, causing the market price of shares to fall.

- **Information content of dividends**

  Some believe that, the level of dividends and particularly the changes in the level of dividends conveys new information to the world. An increased level of dividend might be a signal that the management views the future with confidence. A shareholder might interpret large dividend also as the failure of management to find new investment opportunities for future expansion. This is definitely contrary to what the management wishes the interpretation to be.

1.7 Compliance of Regulatory Requirements In Formulation of Financial Strategies

This Section includes :

- **Legal forms of Organizations**
- **SEBI Act, 1992**
- **Measures and Reforms**
- **Secondary Market and Intermediaries**
- **Mutual Funds**
- **Investor Protection Measures**
- **Regulatory requirements in formulation of financial Strategies**

INTRODUCTION :

The legal form of a firm's organization and the regulatory framework governing it has significant influence on the financial decisions of the firms. This point can be illustrated with the following examples :-

- A private limited company cannot raise equity capital by issuing shares to the public.
- A company which comes under the purview of the Foreign Exchange Management Act (FEMA) cannot undertake certain kinds of investment.

This chapter seeks to build an awareness and appreciation of the forms of organization and the regulatory framework as applicable to business firms in India.

LEGAL FORMS OF ORGANIZATIONS :

- Companies may be classified into various kinds on the following basis:
- I. Classification on the basis of incorporation
- II. Classification on the basis of liability
- III. Classification on the basis of number of members
- IV. Classification on the basis of control
- V. Classification on the basis of ownership

I) Classification on the basis of incorporation

1) **Chartered companies –** These are the companies which are incorporated under a special charter granted by the king or Queen (in England) e.g., the East India Company, the Bank of England. A chartered company is governed by its charter that defines the nature of the company and at the same time incorporates it. These companies find no place in India after the country attained independence in 1947.

2) **Statutory companies –** These are the companies which are created by a special Act of the Legislature, e.g., the RBI, the LIC, the IFC, the UTI. These are mostly concerned with public utilities, e. g., railways, gas and electricity company and enterprises of national importance. The provision of the Companies Act, 1956 apply to them, if they are not consistent with the provisions of the special Acts under which they are formed.

3) **Registered companies –** These are the companies which are formed and registered under the Companies Act, 1956, or were registered under any of the earlier Companies Act. These are most commonly found companies.

II) Classification on the basis of liability

1) **Company limited by shares –** Where the liability of the members of a company is limited to the unpaid amount on the shares, the company is known as a company limited by shares. A company limited by shares may be a public company or a private company.

2) **Company limited by guarantee –** Where the liability of the members of a company is limited to a fixed amount which the members undertake to contributes to the assets of the company in case of its winding up, the company is called a company limited by guarantee.

3) **Unlimited companies –** A company without limited liability is known as unlimited company. In case of such a company every member is liable for the debts of the company in proportion to his interest in the company.

III) Classification on the basis of number of members

1) **Private company –** A private company means a company which by its articles:

   a) Restricts the right to transfer its shares

   b) Limits the number of its members to 50

   c) Prohibits any invitation to the public to subscribe for any shares in or debentures of the company.

2) **Public company –** A public company means a company which by its articles:

   a) Does not restrict the right to transfer its shares, if any

   b) Does not limit the number of its members

   c) Does not prohibit any invitation to the public to subscribe for any share in or debentures of the company.

IV) Classification on the basis of control

1) **Holding company –** A company is known as the holding company of another if it has control over the other company.

2) **Subsidiary company –** A company is known as a subsidiary of another company when control is exercised by the latters (called the holding company) over the former, called a subsidiary company.

A company is deemed to be a Holding Company of a company in the following three cases :

    a) Company controlling composition of Board of Directors.

    b) Holding the majority of shares.

    c) Subsidiary of another subsidiary.

V)   **Classification on the basis of ownership**

    1) Government company – Any company in which at least 51% of the paid-up share capital is held by the Central Government or by any State Government or Governments, or partly by the Central Government & partly by State Governments, e.g., State Trading Corporation of India.

    2) Non-government company – Any company in which the Central Government or any State Government or Governments holds less than 50% of the paid-up share capital.

- **Foreign company.** Any company which is incorporated outside India and has a place of business in India, i.e., where representatives of a foreign company frequently come and stay in a hotel in India for purchasing machinery, raw material, etc., is called foreign company has a place of business in India.

- **Associations not for profit.** The Central Government may grant a license for registration, to an association not for profit with limited liability without using the word "Limited" or the words "Private Limited" to their names. Such license may be granted if it is proved to the satisfaction of the Central Government that it :

    a) is about to be formed as a limited company for promoting commerce, science, religion, charity or any other useful object.

    b) tends to apply its profits, if any, other income in promoting its objects and to prohibit the payment of any dividend to it's members.

- **One-man company.** This is a company (usually private) in which one man holds practically the whole of the share capital of the company, and in order to meet the statutory requirement of minimum numbers of members, some dummy members who are usually the nominees of the principal shareholder, who is the virtual owner of the business and who carries it on with limited liability.

- **Public financial institutions.** The following financial institutions shall be regarded as public financial institutions:

    a) The Industrial Credit and Investment Corporation of India (ICICI)

    b) The Industrial Finance Corporation of India (IFCI)

    c) The Industrial Development Bank of India (IDBI)

    d) The Life Insurance Corporation of India (LIC)

    e) The Unit Trust of India (UTI)

The Central Government is authorized to specify any institution to be a public financial institution. But no institution shall be so specified unless-

a) It has been established as per the constitution or by or under any other Central Act.

b) Not less than 51% of the paid-up share capital of such an institution is held or controlled by the Central Government.

In every country corporate investment and financing decision are guided, shaped and circumscribed by a fairly comprehensive regulatory framework which seeks to

- Define avenues of corporate investment available to business firms in different categories, ownership-wise and size-wise.

- Induce investments along certain lines by providing incentives, concessions and reliefs.

- Impose restrictions on the ways and means by which business firms can raise and deploy funds.

The principal elements of this regulatory framework are:-

- Companies Act.

- Securities and Exchange Board of India Guidelines.

Provision of the Companies Act, 1956

The Companies Act, 1956, as amended up to date covers both the financial and non-financial aspects of the working of the corporate sector. It aims at developing integrated relationship between promoters, investors and company management.

This act seeks to:-

- Ensure a minimum standard of business integrity and conduct in the promotion and management of companies.

- Elicit full and fair disclosure of all reasonable information relating to the affairs of the company.

- Promote effective participation and control by shareholders and protect their legitimate interests.

- Ensure proper performance of duties by the company management.

- Empower the government to intervene and investigate into the affairs of companies which are managed in a manner prejudicial to the interest of the shareholders or the public.

It contains specific provisions to regulate:-

- The issue of capital and matters incidental thereto, viz., content and format of prospectus

- Capital structure of companies

- Dividend distribution

- Inter-corporate investment

- Matters regarding shareholders' meetings and the format of annual accounts

- Procedure for the allotment of shares and the issue of certificates

- Issue of shares at premium or discount

- Voting rights of shareholders

Some of the important company law provisions pertaining to financial management are:

- A company can issue only two kinds of shares : equity shares and preference shares.

- Additional shares has to be offered to existing equity shareholders in proportion to the shares held by them unless the company decides otherwise by passing a special resolution, or by passing an ordinary resolution and securing the permission of the central government, in case of further issue.

- Share capital cannot be issued unless a prospectus, giving prescribed information about the company, is furnished.

- Debenture carrying voting rights cannot be issued.

- The board of directors of a company of a subsidiary thereof, shall not, except with the consent of the company in a general meeting, borrow money which, together with those already borrowed by the company (apart from temporary loans obtained from the company's bankers in the ordinary courses of business), exceeds the aggregate of the paid-up capital of the company and its free reserves.

- A company can, buy up to 10 percent of the subscribed capital of another corporate body, provided that the aggregate of investment made in all other corporate bodies does not exceed 30 percent of the subscribed capital of the investing company.

- Dividends are payable only out of profits, after setting aside a certain percentage towards reserves.

- A company is required to prepare its financial statements (profit and loss account and balance sheet) in a certain manner and format and get the same audited by a chartered accountant.

- A public company is required to get its audited financial statements approved by its shareholders. (The financial statements along with the Directors' Report, Auditors' Report, and annexures to the financial statements as prescribed by the Company's Act constitute the Annual Report of the company).

All equity shareholders have a voting power, but now companies have been allowed to issue non-voting shares. Earlier the law did not permit companies to repurchase their own shares, but now they have been allowed to do so upto a limited extent. The Compains Act is administered by the Department of Company Affairs and the Company Law Board of the ministry of Law and Justice and Company Affairs of the Union Government.

Historically speaking: Capital Issues (Control) Act, 1947

Prior to the establishment of the Securities & Exchange Board of India (SEBI), Capital issues in India were regulated by the Capital Issues (Control) Act, 1947.

The primary objectives of this act were:-

1) To protect the investing public;

2) To ensure that investment by the corporate were in accordance with the plans and that they are not wasteful and in non-essential channels;

3) To ensure that the capital structure of companies was sound in the public interest;

4) To ensure that there is no undue congestion of public issues in any part of the year; and

5) To regulate the volume, terms and conditions for foreign investment.

The Act required companies to obtain prior approval for issues of capital to the public, and for pricing of public and right issues. It empowered the GOI to regulate the timing of new issues by private sector companies, the public companies, the composition of securities to be issued, interest (dividend) rates which can be offered on debentures, floatation costs, and the premium to be charged on securities.

SECURITIES AND EXCHANGE BOARD OF INDIA ACT, 1992 :

In the year 1991, major steps were being taken towards liberalization and reforms in the Indian financial sector. As a result, thereafter, the volume of business in the primary and secondary securities markets increased significantly. This globalisation process made the financial system vulnerable to external shocks, which was further worsened with the various malpractices that crept into the system. All these developments established that, the then existing regulatory framework was fragmented, ill coordinated and inadequate and that there was a need for an autonomous, statutory and integrated organization to ensure the smooth function of the system. The SEBI came into being as a response to these requirements.

The SEBI was established in 1988 through an administrative order, but it became a statutory and really powerful organization since 1992 with the formation of Securities and Exchange Board of India Act, 1992 when the Capital Issues Control Act (CICA) was replaced and the office of the Controller of Capital Issues (CCI) was abolished.

The SEBI is a body of six members comprising the Chairman, two members from the Government of India, Ministries of Law and Finance, one member from the RBI and two other members. The office of the SEBI is in Mumbai.

Objectives, Functions and Powers of SEBI :

The overall objective of the SEBI, as enshrined in the preamble of the SEBI Act, 1992 is "to protect the interests of investors in securities and to promote the development of, and to regulate the securities market and for matters connected therewith or incidental thereto".

To carry out its objectives, the SEBI performs the following functions:-

- Regulate the business in stock exchanges and other securities markets;

- Registering and regulating the working of stock brokers, sub-brokers, share transfer agents, bankers to an issue, merchant bankers, underwriters, portfolio managers, investment advisor and such other intermediaries, who are associated with the securities market in any manner;

- Registering and regulating the working of depositories, custodians of securities, FIIs, credit rating schemes, including mutual funds;

- Promoting and regulating Self-Regulatory Organisations (SROs);

- Prohibiting fraudulent and unfair trade practices relating to the securities market;

- Providing investors' education and training of intermediaries in securities market;

- Prohibiting & Regulating substantial acquisition of shares and takeovers of companies;

- Calling for information from, undertaking inspection, conducing inquiries and audits of the stock exchanges, intermediaries and self-regulatory organizations in the securities market;

- Performing such functions and exercising such powers under the Securities Contract (Regulation) Act, (SCRA) 1956 as may be delegated to it by the Central Government;

- Levying fees & other charges for carrying out its work;

- Conducting research for the above purposes;

- Performing such other functions that may be prescribed

  Under the SEBI Act, some of the powers exercised by the Central Government under SCRA Powers to prohibit contracts in certain cases.

  They relate to the –

- Powers to call for periodical return, direct enquries to be made from any recognized stock exchange;

- Grant approval to any recognized stock exchange & to make bye-laws for the regulation and control of contracts;

- Powers to make & amend bye-laws of recognized stock exchanges;

- Licensing of dealers in securities, in certain areas;

- Powers to compel listing of securities by public companies;

- Granting approval to amendment to the rules of a recognized stock exchange;

- Powers to ask every recognized stock exchange, to furnish to the SEBI, a copy of the annual report containing particulars that may be prescribed;

- Powers to supercede the governing body of a recognized stock exchange;

- Powers to suspend business of any recognized stock exchange.

List of Recognised Stock Exchanges

- The Bombay Stock Exchange Ltd.
- Bangalore Stock Exchange Ltd.
- The Calcutta Stock Exchange Assn. Ltd.
- The Delhi Stock Exchange Ltd.
- The Hyderabad Stock Exchange Ltd.
- Kanara Stock Exchange (Mangalore)
- Madras Stock Exchange Ltd.
- Madhya Pradesh Stock Exchange (Ignore)
- The Magadh Stock Exchange Ltd.
- Saurashtra Kutch Stock Exchange Ltd.
- The Uttar Pradesh Stock Exchange Assn. Ltd.

The Ahmedabad Stock Exchange Ltd.
Bhubaneshwar Stock Exchange Ltd.
Cochin Stock Exchange Ltd.
The Gauhati Stock Exchange Ltd.
Jaipur Stock Exchange Ltd.
Ludhiana Stock Exchange Ltd.
Pune Stock Exchange Ltd.
The Vadodara Stock Exchange Ltd.
The Coimbatore Stock Exchange Ltd.
OTC Exchange of India
National Stock Exchange of India Ltd.

MEASURES AND REFORMS :

To introduce improved and greater transparency in the stock market and capital market, in the interest of healthy capital market development, a number of steps have been taken by SEBI during recent years. The important steps are :-

- The issue of capital by companies no longer requires any consent from any authority either for making the issue or for pricing it.

- Efforts have been made to raise the standards of disclosure in public issues and enchance their transparency.

- The offer document is now made public even at the draft stages.

- Companies making their first public issue are eligible to do so only if they have three years of dividend-paying track record preceding an issue. Those not meeting this requirement can still make an issue if their projects are appraised by banks or FIs with minimum 10 percent participation in the equity capital of the issuer, or if their securities are listed on the OTCEI (Over-the Counter Exchange of India)

- For issues above Rs. 100 Crore, Book Building requirement has been introduced.

- The pricing of preferential allotment has to be market related levels, and there is a five-year lock-in period for such allotment.

- In case of proportionate allotment scheme, a minimum of 50 percent of the net offer to the public is to be reserved for individual investors applying for securities not exceeding 1000 securities, and the remaing part can be allotted to applications for more than 1000 securities.

- Initially, the underwriting of issues to public was mandatory, but now this stipulation has been removed.

- Bankers to an issue and portfolio managers have to be registered with the SEBI.

SECONDARY MARKET AND INTERMEDIARIES :

- The governing boards and various committees of stock exchanges (SEs) have been recognized, restructured and board-based.

- Inspection of all 22 SEs has been carried out to determine the extent of compliance with the directives of the SEBI.

- Computerised or screen – based trading has been achieved on almost all exchanges except some of the smaller ones.

- Corporate membership of SEs is now allowed, encouraged and preferred. The Articles of Association of SEs have been amended so as to increase their membership.

- All these have been directed to establish either a clearing house or a clearing corporation.

- The Bombay Stock Exchange (BSE) has been asked to reduce trading period or settlement cycle from 14 to 7days for B group shares.

- A Process through which investor grievances against brokers may find redressal through a complaint to the SEBI has been put in place.

- All the recommendations of the Dave Committee for improved working of the OTCEI have been accepted. The SEBI has strengthened its own investigation and enforcement machinery.

- In accordance with the recommendations of G.S. Patel Committee, BSE has been allowed to introduce a revised Carry Forward System (CFS) of trading. Other SEs can introduce forward trading only with the prior permission of the SEBI. Transactions are not allowed to be carried forward for more than 90 days now. The share received by financial funding carry forward transactions have to be deposited than kept in the custody of the clearing house of the SE or its authorized agent. Every member is required to keep books and records of the sources of finance with the sub-accounts being maintained in the clearing house. The scrip-wise carry forward position has to be disclosed to the market. The SEs are required to introduce the 'twin track' system which will segregate transactions into carry forward and cash transactions, and each one of the former will be identified with a transaction identification number till its final settlement.

- The brokers are required to ensure segregation of client account and own account.

- The capital adequacy norms of 3% for individual brokers and 6% for corporate brokers introduced.

- Both the brokers and sub-brokers have been brought within the regulatory fold for the first time now; and the concept of the dual registration of stock fold for the first

time SEBI and the SEs has been introduced. The total number of registered brokers and sub-brokers was 8,746 at the end of March 1996, of which 1917 were corporate members.

- Penal action can now be taken directly by the SEBI against any member of a SE for violation of any provision of the SEBI Act.

- It has been made mandatory for the stock brokers to disclose the transaction price and brokerage separately in the contract notes issued by them to their clients.

- The daily margin and additional margin for volatile scrips are now levied on a weekly and market-to-market basis.

- The SEs have amended their Listing Agreement such that the issuers have now to pro-vide shareholders with cash flows statements in a prescribed format, along with the complete balance sheet and the profit and loss statement.

- The trading hours in almost all the SEs been increased from 2½ hours to 3 hours day.

- Compulsory audit of the brokers' book and filling of the audit reports with the SEBI has now been mandatory.

- A system of market making in less liquid scrips on selected transaction has been intro-duced.

- Insider trading has been prohibited and such trading has been made a criminal offence punishable in accordance with the provisions of the SEBI Act.

- Registrars to Issues (RI) and Share Transfer Agents (STA) have now been classified into two categories: Category I with a minimum net worth requirement of Rs. 6 lakhs who carry on the activities both as RI and STA, and Category II with a minimum net worth requirement of Rs. 3 lakhs who can carry on any one of these activities.

- Till end-August 1997, Merchant Bankers (MBs) were classified into four categories, each with different responsibilities and commensurate with capital requirements, with effect from September 1997, such a classification has been abolished and there will be only one entity now, namely, MBs. A system of penalty points for MBs for defaults committed by them have been introduced. It is provided that they can be suspended or deauthorised after a maximum of 8 penalty points. The MBs have to fulfill capital ad-equacy requirements also.

MUTUAL FUNDS :

- It bars mutual funds from options trading, short selling and carrying forward transac-tions in securities. It has been permitted to invest only in transferable securities in the money and capital markets or any privately placed debentures or securities debt.

- Restrictions have also placed on them to ensure that investments under an individual scheme, do not exceed 5% and investment in all schemes put together does not exceed 10% of the corpus. Investments under all schemes cannot exceed 15% of the funds in the shares and debentures of a single company.

- It grants registration to only those mutual funds that can prove an efficient and orderly conduct of business. The track record of sponsors, a minimum experiences of five years in the relevant filed of financial services, integrity in business transactions and financial soundness are taken into account.

- Prescribes the advertisement code for the marketing schemes of mutual funds, the contents of the trust deed, the investment management agreement and the scheme-wise balance sheet.

- They are required to be formed as trusts and management by separately formed Asset Management Companies (AMC). The minimum net worth of such AMCs are stipulated at Rs. 5 crores of which, the minimum contribution of the sponsor should be 40%. Furthemore, the mutual fund should have a custodian who is not associated in any way with the AMC and registered with the SEBI.

- The minimum amount raised in closed-ended scheme should be Rs.20 crores and for the open-ended scheme, Rs. 50 croces. In case, the amount collected falls short of the minimum prescribed, the entire amount should be refunded not latter than six weeks from the date of closure of the scheme. If this is not done, the funds is required to pay an interest at the rate of 15% per annum from the date of expiry of six weeks.

- The mutual funds obligation to publish scheme-wise annual reports, furnish six monthly unaudited accounts, quarterly statements of the movements of the net asset value and quarterly portfolio statements to the SEBI.

- There is also a stipulation that the mutual funds should ensure adequate disclosures to the investors.

- SEBI prohibits the participation of mutual funds in the promoter's quota shares.

- SEBI has agreed to let the mutual funds buy-back the units of their schemes, however, the funds cannot advertise this facility in their prospectus.

- SEBI is also empowered to investigate into transactions of deliberate manipulation, price rigging or deterioration of the financial position of mutual funds, & can suspend the registration of mutual funds if found guilty.

Miscellaneous

- FIIs are also required to be registered with the SEBI.

- It is required that the companies to be registered as depositories must have a net worth of Rs. 100 crore. Similarly custodians are required to have a net worth of Rs. 50 crore, and they are to get their systems and procedures evaluated externally.

- Venture Capital Funds (VCFs) allowed to invest in unlisted companies, to Financial Committee, the minimum turnaround companies and to provide loans.

- As per the approved modified takeover code recommended by the Bhagwati Committee, the minimum public offer of 20% purchase, when the threshold limit to 2% equity is crossed, is made mandatory. Those in control are permitted to 2% of shares

per annum upto a maximum of 51%. The acquirers escrow deposits have to be higher for conditional public offers unless the acquirer agrees to buy a minimum of 20%.

INVESTOR PROTECTION MEASURES :

The SEBI has introduced an automated complaints handling system to deal with investor complaints. To help investors in respect of delay in receiving funds orders in case of oversubscribed issues, a facility in the form of stockinvest has been introduced. To ensure that no malpractice takes place in the allotment of shares, a representative of the SEBI supervises the allotment process. It has also accorded recognition to several genuine, active investor associations. It issues advertisements from time to time to guide and enlighten investors on various issues related to the securities market and their rights and remedies.

The complaints received by the SEBI are categorized in five types:

Type I : Non-receipt of refund orders/allotment letters/stockinvests.

Type II : Non-receipt of dividend

Type III : Non-receipt of share certificates/bonus shares.

Type IV : Non-receipt of debenture certificates/interest on debentures/redemption amount of debentures/interest on delayed payment of interest.

Type V : Non-receipt of annual reports, rights issue forms/interest on delayed receipt of refund orders/dividends.

REGULATORY REQUIREMENTS IN FORMULATION OF FINANCIAL STRATEGIES :

The two major regulatory authorities are the Reserve Bank of India (RBI) and the Securities Exchange Board of India (SEBI). The regulations in the Companies Act, Income Tax Act etc. are more for governance and compliance than for strategy. RBI mainly regulates the commercial banks which in turn may influence the policies of a company. Some of the situations a finance manager has to face, which requires regulatory compliance are:

1. Raising finance through IPO or SPO

IPO refers to Initial Public Offering, the first time a company comes to public to raise money. SPO refers to Seasonal Public Offering, the second and subsequent time a company raises money from the public directly. There are regulatory guidelines prescribed by SEBI regarding the entire process of going public which includes disclosure to public regarding the potential use of the cash, financial projections and percentage of shares offered to various stakeholders etc. Similarly, every time a company wants to access the capital market, either for raising finance through debt or equity, these regulatory compliances have to be met where finance manager will play a key role in providing the necessary information both at the time of raising resources and also at regular intervals subsequently thereafter.

2. Capital Structure changes

Today, companies are permitted to buy their own shares. The finance manager, some times, for strategic reasons, decides to reduce the equity capital. This is technically known as capital reduction, which again requires regulatory compliances prescribed by SEBI and Companies Act.

3. Credit rating

Whenever a company wants to raise money through debt, or through a new instrument, the instrument has to be rated by a credit rating agency like CRISIL, ICRA etc. as per the SEBI guidelines. Similarly, a company also has to be rated. The whole exercise of initiating the rating process providing the relevant information and answering the queries of the rating agencies will be the responsibility of the CFO.

4. Foreign exchange transactions

A company needs foreign exchange for a variety of reasons like importing equipment, setting up of foreign offices, travel of salesmen and other company employees etc. Similarly, a company may receive remittances of foreign exchange for exports made. In either of these situations, the rules and regulations relating to foreign exchange transactions needs to be complied with by the Finance Manager, on behalf of the organization. It involves some filing of returns in the prescribed format.

5. Derivative transactions

Whenever a company uses derivatives for hedging, there are accounting and disclosure requirements to be complied with as per Companies Act & GAAP Accounting, accounting standards of ICAI and the international accounting standards. For example, hedge accounting has to be maintained and profits/losses due to hedging should be reported.

6. Project financing

If a company goes for major project financing option, involving multiple agencies like suppliers, contractors etc, there are a number of requirements for the various stakeholders and financiers like consortium of banks, private equity players etc. Finance Manager plays an important role in complying with the requirements of various agencies involved in the exercise.

1.8 Sources of Finance - Long Term, Short Term and International

This Section includes :

- **Long Term Sources**
- **Short Term Sources**
- **International Sources**

INTRODUCTION :

Companies raise long term funds from the capital markets. Funds availbale for a period of less than one year are short term funds. With the increase in cross-border transactions,international sources of funds are also available. An effective trade-off between the domestic funds and international funds shall contribute towards increasing profitability and wealth maximisation.

LONG TERM SOURCES :

To enable the investments, creation of assets and infrastructure, an organisation require long term sources of funds. They are :
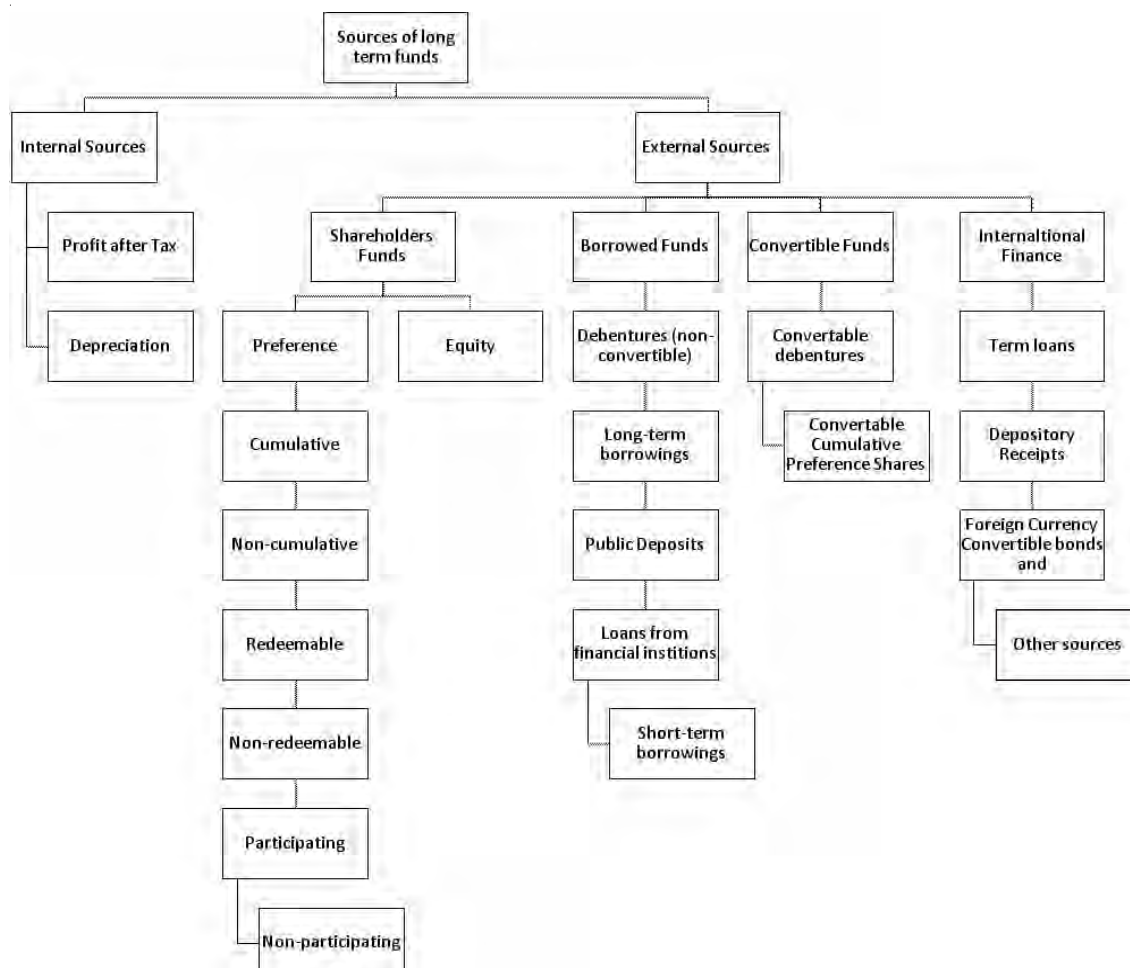
1. Equity Share Capital

Equity share capital is a basic source of finance for any Company. It represents the ownership interest in the company. The characteristics of equity share capital are a direct consequence of its position in the company's control, income and assets. Equity share capital does not have any maturity nor there is any compulsion to pay dividend on it. The equity share capital provides funds, more or less, on a permanent basis. It also works as a base for creating the debt and loan capacity of the firm. The advantages and limitations of equity share capital may be summarized as follows:

Advantages of Equity Share Financing

   a. Since equity shares do not mature, it is a permanent source of fund. However, a company, if it so desires, can retire shares through buy-back as per the guidelines issued by the SEBI.
   b. The new equity share capital increases the corporate flexibility from the point of view of capital structure planning. One such strategy may be to retire debt financing out of the funds received from the issue of equity capital.
   c. Equity share capital does not involve any mandatory payments to shareholders.
   d. It may be possible to make further issue of share capital by using a right offering. In general, selling right shares involves no change in the relationship between ownership and control. Existing shareholders can maintain their proportionate holding by exercising their pre-emptive right.

Limitations of Equity Share Financing

   a. The equity share capital has the highest specific cost of capital among all the sources. This necessitates that the investment proposals should also have equally high rate of return.
   b. Equity dividends are paid to the shareholders out of after-tax profits. These dividends are not tax deductible, rather imply a burden of Corporate Dividend tax on the company.
   c. At times, the new issue of equity capital may reduce the EPS and thus may have an adverse effect on the market price of the equity share.
   d. Excessive issue of equity share can dilute the ownership of the Company.

2. Preference Share Capital

The preference share capital is also owners capital but has a maturity period. In India, the preference shares must be redeemed within a maximum period of 20 years from the date of issue. The rate of dividend payable on preference shares is also fixed. As against the equity share capital, the preference shares have two references: (i) Preference with respect to payment of dividend, and (ii) Preference with reference to repayment of capital in case of liquidation of company.

However, the preference share capital represents an ownership interest and not a liability of the company. The preference shareholders have the right to receive dividends in priority over the equity shareholders. Indeed, it is this preference which distinguishes preference shares from equity shares. A dividend need not necessarily be paid on either type of shares. However, if the directors want to pay equity dividend, then the full dividend due on the

preference shares must be paid first. Failure to meet commitment of preference dividend is not a ground for liquidation. The advantages and disadvantages of the preference share capital are as follows:

Advantages of Preference Share Financing
a. The preference shares carry limited voting right though they are a part of the capital. Thus, these do not present a major control or ownership problem as long as the dividends are paid to them.
b. As an instrument of financing, the cost of capital of preference shares is less than that of equity shares.
c. The preference share financing may also provide a hedge against inflation because the fixed financial commitment which is unaffected by the inflation.
d. As there is no legal compulsion to pay preference dividend, a company does not face liquidation or other legal proceedings if it fails to pay the preference dividends.

Limitations of Preference Share Financing
a. The cost of capital of preference shares is higher than cost of debt.
b. Though there is no compulsion to pay preference dividend, yet the non-payment may adversely affect the market price of the equity shares and hence affect the value of the firm.
c. The compulsory redemption of preference shares after 20 years will entail a substantial cash outflow from the company.
d. If the company is not able to earn a return at least equal to the cost of preference share capital, then it may result in decrease in EPS for the equity shareholders.

3. Debentures

A bond or a debenture is the basic debt instrument which may be issued by a borrowing company for a price which may be less than, equal to or more than the face value. A debenture also carries a promise by the company to make interest payments to the debenture-holders of specified amount, at specified time and also to repay the principal amount at the end of a specified period. Since the debt instruments are issued keeping in view the need and cash flow profile of the company as well as the investor, there have been a variety of debt instruments being issued by companies in practice. In all these instruments, the basic features of being in the nature of a loan is not dispensed with and, therefore, these instruments have some or the other common features as follows:

(i) **Credit Instrument**—A debenture-holder is a creditor of the company and is entitled to receive payments of interest and the principal and enjoys some other rights.
(ii) **Interest Rate**— In most of the cases, the debt securities promise a rate of interest payable periodically to the debt holders. The rate of interest is also denoted as coupon rate.
(iii) **Collateral**— Debt issue may or may not be secured and, therefore, debentures or other such securities may be called secured debentures or unsecured debentures.
(iv) **Maturity Date**— All debt instruments have a fixed maturity date, when these will be repaid or redeemed in the manner specified.
(v) **Voting Rights**— As the debt holders are creditors of the company, they do not have any voting right in normal situations.

(vi) **Face Value**— Every debt instrument has a face value as well as a maturity value.

(vii) **Priority in Liquidation**— In case of liquidation of the company, the claim of the debt holders is settled in priority over all shareholders and, generally, other unsecured creditors also.

In practice, different types of debentures have been issued. These are :

(a) **Convertible Debentures**— In this case, the debentures are converted, fully or partially, into equity shares some time after the date of issue.

(b) **Non-convertible Debentures**— These debentures remain a debt security till maturity. Interest is paid on these debentures as per terms and conditions.

(c) **Innovative Debentures**— Companies have come forward to issue a debt security with different attractive and innovative features. Some of these are - Secured Premium Notes, Optionally Convertible Debentures, Triple Option Convertible Debentures, etc. Financial Institutions such as IDBI have issued Deep Discount Bonds (DDBs) from time to time to procure funds for a longer period.

4. Lease and Hire Purchase

Instead of procuring funds, and purchasing the equipment, a firm can acquire the asset itself on lease. In this case, the asset is financed by the lessor but the lessee gets the asset for use. In case of hire purchase, the assets are acquired on credit and payments are made as per terms and conditions.

5. Term Loans

This is also an important source of long-term financing. There are different financial institutions (National level as well as State level) which provide financial assistance for taking up projects. Term loan, as a source of long-term finance, is discussed in detail, at a later stage in this chapter.

SHORT TERM SOURCES OF FINANCE/ WORKING CAPITAL MARGIN:

A project requires working capital margin to take up day-to-day operations. The working capital amount is divided into two parts- (a) Permanent working capital, and (b) Temporary working capital. The Permanent working capital should be financed from long-term sources and temporary working capital should be financed from short term sources. Some of the short-term sources are :

1. Trade Credit

The credit extended in connection with the goods purchased for resale by a retailer, or for raw materials used by manufacturer in producing its products is called the trade credit. The trade credit may be defined as the credit available in connection with goods and services purchased for resale. It is the 'resale' which distinguishes trade credit from other sources. For example, fixed assets may be purchased on credit, but since these are to be used in the production process rather than for resale, such credit purchase of fixed assets is not called the trade credit.

When a firm buys goods from another, it may not be required to pay for these goods immediately. During this period, before the payment becomes due, the purchaser has a debt outstanding to the supplier. This debt is recorded in the buyer's balance sheet as creditors; and the corresponding account for the supplier is that of debtors. Normal business transactions,

therefore, provide the firm with a source of short-term financing (trade credit) because of the time gap between the receipts of goods and services and payment thereof. The amount of such financing depends on the volume of purchases and the payment timing. Small and new firms are usually more dependent on the trade credit, as they find it difficult to obtain funds from other sources. Trade credit may take form of open account or bills payable.

2. Accrued Expenses

Another source of short-term financing is the accrued expenses or the outstanding expenses liabilities. The accrued expenses refer to the services availed by the firm, but the payment for which has not yet been made. It is a built-in and an automatic source of finance as most of the services, are paid only at the end of a period. The accrued expenses represent an interest free source of finance. There is no explicit or implicit cost associated with the accrued expenses and the firm can save liquidity by accruing these expenses.

3. Commercial Papers

Commercial Paper (CP) is an unsecured promissory note issued by a firm to raise funds for a short period, generally, varying from a few days to a few months. For example, in India, the maturity period of CP varies between 15 days to 1 year while in some other countries, the maturity period may go up to 270 days. It is a money market instrument and generally purchased by commercial banks, money market mutual funds and other financial institutions desirous to invest their funds for a short period. As the CP is unsecured, the firms having good credit rating can only issue the CP.

The firm or the dealers in CP sell these to the short-term lenders who use it as interest earning investment of temporary surplus of operating funds. The nature of these surpluses and motives for buying the CP suggest that all the holders of the Cp expect to be paid in full at maturity. The maturity term of CP is not generally extended. This expectation on the part of short-term tenders requires that the borrowing firm must be (i) an established and profitable firm, and (ii) consistently maintaining a credit goodwill in the market and having good credit rating. The interest cost of the CP depends upon the amount involved, maturity period and the prime lending rates of commercial banks. The main advantage of CP is that the cost involved is lower than the prime lending rates. In addition to this cost, the borrowing firm has to bear another cost in the form of placement fees payable to the dealer of CP who arranges the sale.

Issue of Commercial Papers in India

CP was introduced as a money market instruments in India in January, 1990 with a view to enable the companies to borrow for short term. Since the CP represents an unsecured borrowing in the money market, the regulation of CP comes under the purview of the Reserve Bank of India which has issued Guidelines in 2000 superseding all earlier Guidelines. These Guidelines are aimed at :

    (i)   Enabling the highly rated corporate borrowers to diversify their sources of short-term borrowings, and

    (ii)   To provide an additional instrument to the short-term investors.

These Guidelines have stipulated certain conditions meant primarily to ensure that only financially strong companies come forward to issue the CP. The main features of the guidelines relating to issue of CP in India may be summarized as follows :

(a) CP should be in the form of usance promissory note negotiable by endorsement and delivery. It can be issued at such discount to the face value as may be decided by the issuing company. CP is subject to payment of stamp duty.

(b) In terms of the guidelines, the issuer company is not permitted to take recourse to the underwriters for underwriting the issue of CP.

(c) CP is issued in the denomination of Rs. 5,00,000 and the minimum lot or investment is Rs. 5,00,000 per investor. The secondary market transactions can be Rs.5,00,000 or multiples thereof. The total amount proposed to be issued should be raised within two weeks from the date on which the proposal is taken on record by the bank.

(d) CP should be issued for a minimum period of 15 days and a maximum of 12 months. No grace period is allowed for repayment and if the maturity date falls on a holiday, then it should be paid on the previous working day. Each issue of CP is treated as a fresh issue.

(e) Commercial papers can be issued by a company whose (i) tangible net worth is not less than Rs. 4 crores, (ii) funds based working capital limit is not less than 4 crores, (iii) shares are listed on a stock exchange, (iv) specified credit rating of P2 is obtained from CRISIL or A2 from ICRA, and (v) the barrowed account of the company is standard asset for the bank.

(f) The issue expenses consisting of dealer's fees, credit rating agency fees and other relevant expenses should be borne by the issuing company.

(g) CP may be issued to any person, banks, companies, NRI, FII. The issue of CP to NRIs can only be on a non-re-patriation basis and is not transferable.

(h) An issuer can issue CP upto a limit approved by the Board of Directors.

(i) Deposits by the issuer of CP have been exempted from the provisions of Section 58A of the Companies Act, 1956.

In case, the CPs are issued to NRI or OCB, the amount shall be received by inward remittance from outside India or form an account held as per RBI Regulations.

Any company proposing to issue CP has to submit an application to the bank which provides working capital limit to it, along with the credit rating of the firm. The issue has to be privately placed within two weeks by the company or through a merchant banker. The initial investor pays the discounted value of the CP to the firm. Thus, CP is issued only through the bank who has sanctioned the working capital limit and it does not increase the working capital resources of the firm.

The annual financing cost of CP depends upon the discount on issue and the maturity period. The annualized pre-tax cost of CP may be ascertained as follows:

$$Annual\ Financing\ Cost = \frac{FV - SP}{SP} \times \frac{360}{MP}$$

Where FV = Face value of CP

             SP = Issue price of CP

             MP = Maturity period of CP.

For example, a CP of the face value of Rs. 5,00,000 is issued at Rs. 4,80,000 for a maturity period of 120 days. The annual financing cost of the CP is :

$$Annual\ Financing\ Cost = \frac{5,00,000 - 4,80,000}{4,80,000} \times \frac{360}{120} = 12.5\%$$

CP as a Source of Financing

From the point of the issuing company, CP provides the following benefits:

(a) CP is sold on an unsecured basis and does not contain any restrictive conditions.

(b) Maturing CP can be repaid by selling new CP and thus can provide a continuous source of funds.

(c) Maturity of CP can be tailored to suit the requirement of the issuing firm.

(d) CP can be issued as a source of fund even when money market is tight.

(e) Generally, the cost of CP to the issuing firm is lower than the cost of commercial bank loans.

However, CP as a source of financing has its own limitations

(i) Only highly credit rated firms can use it. New and moderately rated firms generally are not in a position to issue CP.

(ii) CP can neither be redeemed before maturity nor can be extended beyond maturity.

So, CP is advantageous both to the issuer as well as to the investor. The issuer can raise short-term funds at lower costs and the investor as a short term outlet of funds. CP provides liquidity as they can be transferred. However, the issuer must adhere to the RBI guidelines.

4. Inter-corporate Deposits (ICDs)

Sometimes, the companies borrow funds for a short-term period, say up to six months, from other companies which have surplus liquidity for the time being. The ICDs are generally unsecured and are arranged by a financier. The ICDs are very common and popular in practice as these are not marred by the legal hassles. The convenience is the basic virtue of this method of financing. There is no regulation at present in India to regulate these ICDs. Moreover, these are not covered by the Section 58A of the Companies Act, 1956, as the ICDs are not for long term. The transactions in the ICD are generally not disclosed as the borrowing. The ICDs imply a liquidity shortage of the borrower. The rate of interest on ICDs varies depending upon the amount involved and the time period. The entire working of ICDs market is based upon the personal connections of the lenders, borrowers and the financiers.

5. Short-term Unsecured Debentures

Companies have raised short-term funds by the issue of unsecured debentures for periods up to 17 months and 29 days. The rate of interest on these debentures may be higher than the rate on secured long-term debentures. It may be noted that no credit rating is required for the issue of these debentures because as per the SEBI guidelines, the credit ratings required for debentures having maturity period of 18 months or more. The use of unsecured debentures as a source of short-term financing, however, depends upon the state of capital market in the economy. During sluggish period, the companies may not be in a position to issue these debentures. Moreover, only established firms can issue these debentures as new company

will not find favour from the investors. Another drawback of this source is that the company procures funds from retail investors instead of getting a lump-sum from one source only. Further, that the issue of securities in capital market is a time consuming process and the issue must be planned in a proper way.

6. Bank Credit

Credit facility provided by commercial banks to meet the short-term and working capital requirements has been important short term sources of finance in India. The bank credit, in general, is a short, term financing, say, for a year or so. This short-term financing to business firm is regarded as self-liquidating in the sense that the uses to which the borrowing firm is expected to put the funds are ordinarily expected to generate cash flows adequate to repay the loan within a year. Further, these loans are called self-liquidating because the bank's motive to provide finance is to meet the seasonal demand, e.g., to cover the seasonal increase in inventories or receivables. In principle, the bank credit is intended to carry the firm through seasonal peaks in financing need. The amount of credit extended by a bank may be referred to as a credit limit which denotes the maximum limit of loan which the firm can avail from the bank. Sometimes, the bank may approve separate limits for peak season and non-peak season.

Types of Bank Credit

In India, banks may give financial assistance in different shapes and forms. The usual form of bank credit is as follows:

A. Overdraft— It is the simplest of different forms of bank credit. In this case, the borrowing firm which already has a current account with the bank is allowed to withdraw more (up to a specified limit) over and above the balance in the current account. The firm is not required to seek approval of the bank authority every time it is overdrawing.

B. Cash Credit— The credit facility under the cash credit is similar to the over draft. Under the cash credit, a loan limit is sanctioned by the bank and the borrowing firm can withdraw any amount at any time, within that limit. The interest is charged at the specified rate on the amount withdrawn and for the relevant period. The bank may or may not charge any minimum commitment fee.

C. Bills Purchased and Bills Discounting— Commercial banks also provide short-term credit by discounting the bill of exchange emerging out of commercial transactions of sale and purchase. In the normal course of credit sales, the seller of the goods may draw a bill on the buyer of the goods who accepts the bill and there by promises to pay the bill as per terms and conditions mentioned in the bill. However, if the seller wants the money before the maturity date of the bill, he can get the bill discounted by a bank which will pay the amount of the bill to the seller after charging some discount. The discount depends upon the amount of the bill, the maturity period and the prime lending rate prevailing at that time.

The bill discounting is common only among small-size business firms. One of the short-coming of the bill discounting system is that the bank, which discounts that bill, must establish and verify the creditworthiness of the buyer, which, at times, may be difficult, complicated and time consuming process.

D. Letter of Credit— A letter of credit is a guarantee provided by the buyer's banker to the seller that in case of default or failure of the buyer, the bank shall make the payment to the seller. The responsibility of the buyer is assumed by the bank in case the latter fails to honour

his obligations. The letter of credit issued by the bank may be given by the buyer to the seller along with the bill of exchange. So, in fact, the letter of credit becomes a security of the bill and any bank (or the bank of the seller) will have no problem in discounting the bill.

E. Working Capital Term Loan— Generally, the banks while granting working capital facility to a customer stipulate that a margin of 25% would be required to be provided by the customer and hence the bank borrowing remains only limited to 75% of the security offered. In other words, against a security of Rs. 100, the bank gives a loan of up to Rs. 75. The short-fall is generally treated as Working Capital Term Loan (WCTL). This WCTL is to be repaid in a phased manner varying between a period of two to five years.

F. Funded Interest Term Loan— Sometimes, a company because of its operations may not be able to pay the interest charge on its working capital cash credit facility obtained from a commercial bank. Such accumulation of unserviced interest makes the cash credit account irregular and in excess of the sanctioned limit. It also prevents the firm to make further operations in the account. Such unserviced accumulated interest may be transferred by the bank from cash credit account to Funded Interest Term Loan (FITL). This will enable the firm to operate its cash credit account. The FITL is considered separately for repayment.

INTERNATIONAL SOURCES :

A. Depository Receipts (DR)

A DR means any instrument in the form of a depository receipt or certificate created by the Overseas Depository Bank outside India and issued to the non-resident investors against the issue of ordinary shares. A Depository Receipt is a negotiable instrument evidencing a fixed number of equity shares of the issuing company generally denominated in US dollars. DRs are commonly used by those companies which sell their securities in international market and expand their shareholdings abroad. These securities are listed and traded in International Stock Exchanges. These can be either American Depository Receipt (ADR) or Global Depository Receipt (GDR). ADRs are issued in case the funds are raised through retail market in United States. In case of GDR issue, the invitation to participate in the issue cannot be extended to retail US investors. As the DRs are issued in overseas capital markets, the funds to the issuer are available in foreign currency, generally in US $.

B. Foreign Currency Convertible Bonds (FCCBs)

The FCCB means bonds issued in accordance with the relevant scheme and subscribed by a non-resident in foreign currency and convertible into ordinary shares of the issuing company in any manner, either in whole or in part, on the basis of any equity related warrants attached to debt instruments. The FCCBs are unsecured, carry a fixed rate of interest and an option for conversion into a fixed number of equity shares of the issuer company. Interest and redemption price (if conversion option is not exercised) is payable in dollars. Interest rates are very low by Indian domestic standards. FCCBs are denominated in any freely convertible foreign currency.

FCCBs have been popular with issuers. Local debt markets can be restrictive in nature with comparatively short maturities and high interest rates. On the other hand, straight equity-issue may cause a dilution in earnings, and certainly a dilution in control, which many shareholders, especially major family shareholders, would find unacceptable. Thus, the low coupon security which defers shareholders dilution for several years can be alternative to an issuer. Foreign investors also prefer FCCBs because of the Dollar denominated servicing, the

conversion option and the arbitrage opportunities presented by conversion of the FCCBs into equity at a discount on prevailing Indian market price.

C. External Commercial Borrowings (ECB)

Indian promoters can also borrow directly from foreign institutions, foreign development bank, World Bank, etc. It is also known as Foreign Currency Term loans. Foreign institutions provide foreign currency loans and financial assistance towards import of plants and equipments. The interest on these loans is payable in foreign currency. On the payment date, interest amount is converted into domestic currency at the prevailing foreign exchange rate. The borrowings, repayment and interest payments can be tailor-made in view of the cash flow position of the project.

Other Sources

In addition to the sources discussed above, there are some sources which may be availed by a promoter on casual basis. Some of these are:

(a) **Deferred Credit—** Supplier of plant and equipment may provide a credit facility and the payment may be made over number of years. Interest on delayed payment is payable at agreed terms and conditions.

(b) **Bills Discounting—** In this scheme, a bill is raised by the seller of equipment, which is accepted by the buyer promoter of the project. The seller realizes the sales proceeds by getting the bill discounted by a commercial bank which, in turn gets the bill rediscounted by IDBI.

(c) **Seed Capital Assistance—** At the time of availing loan from financial institutions, the promoters have to contribute seed capital in the project. In case, the promoters do not have seed capital, they can procure the seed capital from 'Seed Capital Assistance Schemes'. Two such schemes are:

(i) Risk Capital Foundation Scheme— The scheme was promoted by IFCI to provide seed capital upto Rs. 40 lakhs to the promoters.

(ii) Seed Capital Assistance Scheme— Under this scheme, seed capital for smaller projects is provided upto Rs. 15 lakhs by IDBI directly or through other financial institutions.

1.9 Exchange Rate – Risk Agencies Involved and Procedure Followed In International Financial Operations

This Section includes :

- **Assessment of Exchange Rate Risk**
- **Exposures**
- **Hedging Tools**
- **Accounting for the Effect of Changes in Foreign Exchange Rates**

INTRODUCTION :

In view of the substantial and significant stake in foreign countries, foreign exchange risk has become an integral part of the management activities of any multinational enterprise. Therefore, the management must be aware of the various techniques of dealing with ERR. Covering the foreign exchange risk is also known as hedging the risk. If a company in its wisdom does not want to hedge, it tantamount to have the view that the future movements of exchange rates will be in its favour. On the contrary, the conservative enterprises may adopt the policy of hedging everything.

EXCHANGE RATE RISK ASSESSMENT :

Exchange rate risk (ERR) is inherent in the businesses of all multinational enterprises as they are to make or receive payments in foreign currencies. This risk means eventual losses incurred by these enterprises due to adverse movements of exchange rates between the dates of contract and payment. However, ERR does not imply that it will result into losses only. Gains may also accrue if the movement of rates is favorable.

Hedging obviously means a certain cost to an enterprise. Suppose the company hedges the exposure and the forward rates move in favour of the company due to a shift in economic factors between the dates of invoice and conversion of currency, the company would suffer or lose on this account.

There are two types of techniques to cover exchange rate risk: internal techniques, adopted by the enterprise to limit the exchange risk, and external techniques that require a recourse to forward market, money market and external organizations.

EXPOSURES :

Multinational enterprises are subject to the following three types of risks/exposures:

- Transaction Exposure
- Consolidation Exposure
- Economic Exposure

Transaction Exposure

Whenever there is a commitment to pay foreign currency or possibility to receive foreign currency at a future date, any movement in the exchange rate will affect the domestic value of the transaction. The following situations give rise to transaction exposure:

- Trade transactions with foreign countries when billing is done in foreign currencies like export or imports;
- Banking and financial transactions done in foreign currencies like lending and borrowing or equity participation, etc.

Consolidation (or Translation) Exposure

This results from direct (joint ventures) or indirect investments (portfolio participation) in foreign countries. When balance sheets are consolidated, the value of assets expressed in the national currency varies as a function of the variation of the currency of the country where investment was made. If, at the time of consolidation, the exchange rate is different from what it was at the time of the investment, there would be a difference of consolidation. The accounting practices in this regard vary from country to country and even within a country from company to company.

There is great responsibility on the part of corporate finance manager, who is expected to manage the assets and liabilities with fluctuating foreign exchange rates in such a way that the profits and cash-flow levels stick to budgeted levels as far as possible.

Economic Exposure

In an open economy, the strength of currencies of competitors due to relative costs and prices in each country which, in turn, have a bearing on exchange rate and the structure of business itself gives rise to economic exposure which may put companies at a competitive disadvantage. Though this is not a direct foreign exchange risk exposure, the underlying economic factors may become a risk factor.

HEDGING TOOLS :

Internal Techniques Of Hedging

There are several techniques which can be used in this category to reduce the exchange rate risk:

- Choosing a particular currency for invoice
- Leads and Lags
- Indexation clauses in contracts
- Netting
- Shifting the manufacturing base
- Centre of reinvoicing
- Swaps

Choice of the Currency of Invoicing
In order to avoid the exchange rate risk, many companies try to invoice their exports in the national currency and try to pay their suppliers in the national currency as well. This way an

exporter knows exactly how much he is going to receive and how much he is to pay, as an importer.

This method is a noble one. However, an enterprise suffers under this method if the national currency appreciates; this is likely to result into a loss of market for the products of the company if there are other competitors.

Companies may also have recourse to invoicing in a currency whose fluctuations are less erratic than those of the national currency. For example, in the countries of the European Union, the use of European Currency Unit (ECU) is gaining popularity.

Leads and Lags

This technique consists of accelerating or delaying receipt or payment in foreign exchange as warranted by the position/expected position of the exchange rate. The principle involved is rather simple.

If depreciation of national currency is apprehended, importing enterprises like to clear their dues expeditiously in foreign currencies; exporting enterprises prefer to delay the receipt from their debtors abroad. These actions, however, if generalized all over the country, may weaken the national currency. Therefore, certain countries like France regulate the credits accorded to foreign buyers to avoid market disequilibrium.

The converse will hold true if an appreciation of national currency is anticipated; importing enterprises delay their payments to foreigners while the exporting ones will attempt to get paid at the earliest. These actions may have a snowballing effect on national currency appreciating further.

Indexation Clauses in Contracts

For protecting against the exchange rate risk, sometimes, several clauses of indexation are included by exporters or importers.

A contract may contain a clause whereby prices are adjusted in such a manner that fluctuations of exchange rate are absorbed without any visible impact. If the currency of the exporting country appreciates, the price of exports is increased to the same extent or vice-versa. Therefore, the exporter receives almost the same amount in local currency. Thus, exchange rate risk is borne by the foreign buyer.

There is another possibility where the contracting parties may decide to share the risk. They may stipulate that part of exchange rate variation, intervening between the date of contract and payment, will be share by the two in accordance with a certain formula, for example, half-half or one-third, two-third, etc.

Netting (Internal Compensation)

An enterprise may reduce its exchange risk by making and receiving payments in the same currency. Exposure position in that case is simply on the net balance. Hence an enterprise should try to limit the number of invoicing currencies. The choice of currency alone is not sufficient. Equally important is that the dates of settlement should match.

Bilateral

Netting may be bilateral or multilateral. It is bilateral when two companies have trade relations and do buying and selling reciprocally. For example, a parent company sells semi-finished products to its foreign subsidiary and then repurchases the finished product from the latter.

Multilateral

Netting can equally be multilateral. This is taken recourse to when internal transactions are numerous. Volume of transactions will be reduced because each company of the group will pay or be paid only net amount of its debit or credit.

Switching the Base of the Manufacture

In the case of manufacturing companies, switching the base of manufacture may be useful so that costs and revenues are in the same currency, e.g. Japanese car manufacturers have opened factories in Europe.

Reinvoicing Centre

A reinvoicing centre of a multinational group does billing in respective national currencies of subsidiary companies and receives the invoices made in foreign currency from each one of them. It would be preferable, if possible, to locate the reinvoicing centre in a country where exchange regulations are least constraining.

The centre itself is a subsidiary of the parent company. The principle is simple: the invoices of foreign currencies are made in the name of the reinvoicing centre by the subsidiaries. And, the centre, in turn, will send equivalent sums in national currency. Likewise, payments in foreign currencies to suppliers are made by the centre and it receives equivalent sums in the national currencies from the subsidiaries concerned. Figure indicates how the flow of currencies takes place.
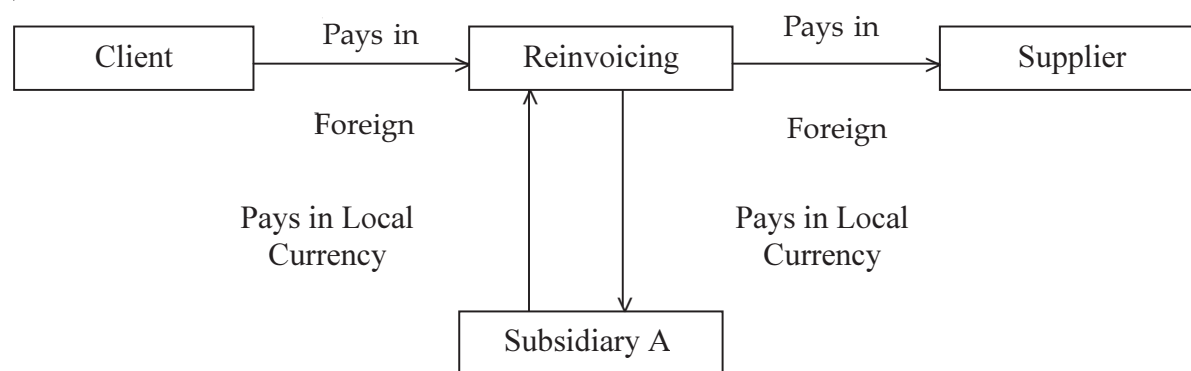
Receipts and Payments through Reinvoicing Centre

The management of exchange risk is thus centralized at a single place. This helps in reducing the volumes of foreign currency transfers and hedging costs. However, one often encounters

the problem where dates of maturity do not match. Besides, the exchange regulations in some countries may not permit reinvoicing.

Swaps in Foreign Currencies

Swap is an agreement reached between two parties which exchange a predetermined sum of foreign currencies with a condition to surrender that sum on a pre-decided date. It always involves two simultaneous operations: one spot and the other on a future date.

There are various types of swaps such as cross-credit swaps, back-to-back credit swaps, and export swaps, etc.

External Hedging Tools

Risks under transaction exposure can be minimized using various tools available in the foreign exchange and financial markets. Of these, four are important.

- Forward exchange contracts
- Money market hedge
- Currency Futures
- Options

Forward Exchange Rate Contracts

You would like to recap the basic features of forward contracts that we learnt in Part 1.

- The contract is for the purchase or sale of a specified quantity of a specified currency price is agreed today.
- Performance is at a future date. This future time can be either a specified date, or any time between two specified dates.
- Both parties are obliged to perform.

Other relevant points are
1. Though spot rates can be obtained for most of the currencies, it may not be possible to enter into forward exchange contracts for all those currencies for which there is a spot market. The reason is insufficiency of demand, or a high volatility in exchange rates.
2. The length of time (depth) up to which one can stretch forward depends upon demand levels. In India, forward rates are available for 6 month periods and can be rolled over. Exotic (minor) currencies such as Argentinean Peso may not have a forward exchange market beyond three months. The longer is the period into future time – span, the wider is the bid-ask spread. The size of spread for a given currency increases with maturity.
3. There are three standard periods of time in a forward market, namely, "one – month", "three – months" and "six-months". Rates for such periods can be had instantly alongside spot rates.
4. Forward rates for odd-periods, falling outside the ambit of standard periods, e.g. 72

days or 95 days can also be secured, but are specifically tailor-made to suit the needs of customers.

5. Generally, a forward exchange contract is entered for delivery of underlying foreign currency asset on a given specified future date. But this is not always the case. There can be variations, and banks do provide built-in flexibility to traders, to accommodate them in situations where the delivery date is uncertain. These are known as option forward exchange contracts.

Forward Contracts

A forward contract as we know is a contract to either buy or sell foreign currency, on a future date. We also know that both the parties under the contract are obligated to perform. Suppose, you have entered into a forward contract. You could either be

a) A buyer of foreign currency (Importer)
b) A seller of foreign currency (Exporter)

You could close out this contract either:

a) On the due date of settlement of the forward contract. Or,
b) On any date prior to the due date of settlement of the forward contract.

Closing out can be done either by:

a) Honoring the contract
b) Rolling over the contract (i.e., extending the contract.)
c) Cancelling the contract.

Money Market Hedge

Money market is a market for short-term instruments. In this market you can borrow or lend for a short period of time. Salient features are:

1. Short period of time – ranges from an "overnight" time period (a day comprising 24 hours from the close of business hours on day – 1 till close of business hours on day-2) to generally six to twelve months.
2. Each time period will have its own interest rates – lowest for overnight periods, and increasing gradually with the tenor of the borrowing/lending.
3. Money market rates are always given in nominal annual rates. If a rate of 8% is quoted, it means 8% per annum and will have to be adjusted for the relevant time period. A three-month tenor would thus carry interest at 2% (8 x 3/12)
4. Interest or deposit rates differ from country to country, and hence currency to currency.

Money market hedge involves:

- Borrowing in foreign currency (say $) in the case of exports
- Investing in foreign currency (say ¥) in the case of imports

Steps to be adopted

1. Identify whether Foreign Currency (FC) is asset or liability
    *   Importer will have foreign currency liability,
    *   Exporter will have foreign currency asset.

2. Create the opposite position either by borrowing or depositing the amount equal to present value of FC liability or FC asset and rates are adjusted for the period of loan or deposit
    *   Importer will create FC asset,
    *   Exporter will create FC liability.

3. Convert the borrowed funds into required currency
    *   Importers have to convert domestic currency into foreign currency at spot rate,
    *   Exporters have to convert FC funds borrowed into domestic currency at spot rate.

4. Invest the borrowed funds
    *   Importer will deposit the FC overseas,
    *   Exporter will deposit in domestic.

5. Settle the payments by withdrawing deposited amounts along with interest
    *   Importer will receive maturity proceeds of FC asset and settle FC liability,
    *   Exporter will get the asset value from overseas customer, and settle FC liability there itself.

Currency Futures

You are already familiar with the relevance and significance of both futures and options in the context of stock market operations. (Refer to the Chapter on Derivatives). In the context of international finance, such derivative instruments come in handy as one of the tools to hedge the risks in exchange rate movements. These are known as currency futures or currency options. A brief summary of salient features are touched upon in the following paragraphs.

Financial futures contracts include – besides stock market indices – futures contracts for interest rates, and currencies. We are concerned with currency futures and currency options in this chapter.

What are Currency Futures?

Financial futures contracts were first introduced by the International Monetary Markets Division of Chicago Mercantile Exchange, in order to meet the needs for managing currency risks, and prompted by a galloping growth in international business. London International Financial Futures and Options Exchange (LIFFE), set up in 1982 had been dealing in currency futures, but have restricted their activity to interest – rate futures.

A currency futures contract is a derivative financial instrument that acts as a conduct to transfer risks attributable to volatility in prices of currencies. It is a contractual agreement

between a buyer and a seller for the purchase and sale of a particular currency at a specific future date, at a predetermined price. A futures contract involves an obligation on both the parties to fulfill the terms of the contract.

The fundamental advantage is hedging risks.

In a currency futures contract, one of the 'paid' of the currencies is invariably the US $. That is, you can buy or sell a futures contract only with reference to the USD. There are six steps involved in the technique of hedging through futures. These are:

i)   Estimating target outcome (with reference to spot rate available on a given date)

ii)   Deciding on whether Futures Contracts should be bought or sold

iii)   Determining number of contracts (this is necessary, since contract size is standardized)

iv)   Identifying profit or loss on target outcome

v)   Closing out futures position and

vi)   Evaluating profit or loss on futures

We shall walk through this process, with the help of an example, taking GBP and USD as the paid of currencies.

Option Contracts

Mechanics of Hedging through Options

Hedging through options is a simple four-step process.

1. Deciding on Call or Put options (i.e., whether to buy or sell a currency)
2. Determining number of contracts
3. Selecting an acceptable exercise price, pay premium and conclude the contract.
4. On maturity, i) If market rate is less favourable, exercise your option under the contract, and ii) if market rate is more favourable, ignore the contract and buy or sell in the market.

ACCOUNTING FOR THE EFFECT OF CHANGES IN FOREIGN EXCHANGE RATES (AS-11) :

This standard deals with accounting for transactions in foreign currencies in the financial statements of an enterprise and with translation of the financial statements of foreign branches into rupees for the purpose of including them in the financial statements of the enterprise.

Exchange rate is the ratio for exchange of two currencies as applicable to the realization of a specific liability or the recording of a specific transactions or a group of inter-related transactions. AS – 11 (revised) suggests the following accounting policy relating to changes in exchange rates :

(i) If any foreign currency loan is linked to purchase of fixed assets from a country outside India and the loan liability changes as on the balance sheet date because of exchange rate fluctuations, the resultant loss/gain is adjusted with the carrying amount of fixed assets.

(ii) Any other monetary items (assets) and liabilities denominated in a foreign currency is translated into India currency using the closing exchange rate. If the closing rate is not realistic, an appropriate realistic rate should be used which reflects the likely realization or disbursements.

(iii) Non-monetary items (assets) other than fixed assets which are carried in terms of historical cost denominated in terms of foreign currency, should be reported using the exchange rate at the date of the transactions.

(iv) Non-monetary items other than fixed assets, which are carried in terms of fair value or other similar valuation, e.g. net realizable value, denominated in a foreign currency should be reported using the exchange rates that existed when the values were determined (e.g. if the fair value is determined as on the balance sheet date, the exchange rate on the balance sheet date may be used); and

(v) Exchange differences arising on foreign currency transactions should be recognized as income or expense.

(vi) If enterprise enters into a forward exchange contract, the difference between the forward rate and actual exchange rate as on date of contract should be recognized as income or loss if the contract measures within the same accounting period. In case the measuring date falls in the next accounting period, income/loss should be recognized proportionately.

AS-11 also deals with transaction of financial statements of foreign branches. The financial statement of foreign branches should be translated by using the procedures given below :

1. Revenue items, except opening and closing inventories and depreciation, should be translated into reporting currency of the reporting enterprise at average rate. In appropriate circumstances, weighted average rate may be applied, e.g., where the income or expenses are not earned or incurred evenly during the accounting period (such as in the case of seasonal businesses) or where there are exceptionally wide fluctuations in exchange rate during the accounting period. Opening and closing inventories should be translated at the rates prevalent at the commencement and close respectively of the accounting period. Depreciation should be translated at the rates used for the translation of the values of the assets on which depreciation is calculated.

2. Monetary items should be translated using the closing rate. However, in circumstances where the closing rate does not reflect with reasonable accuracy the amount in reporting currency that is likely to be realized form, or required to disburse, the foreign currency item at the balance sheet date, a rate that reflects approximately the likely realization or disbursement as aforesaid should be used.

3. Non-monetary items other than inventories and fixed assets should be translated using the exchange rate at the date of the transaction.

4. Fixed assets should be translated using the exchange rate at the date of the transaction. Where there has been an increase or decrease in the liability of the enterprise, as expressed in Indian rupees by applying the closing rate, for making payment towards the whole or a part of the cost of a fixed asset or for repayment of the whole or a part of monies borrowed by the enterprise from any person, directly or indirectly, in foreign currency specifically for the purpose of acquiring a fixed asset, the amount by which the liability is so increased or reduced during the year, should be added to, or reduced from, the historical cost of the fixed cost concerned.

5. Balance in 'head office account', whether debit or credit, should be reported at the amount of the balance in the 'branch account' in the books of the head office after adjusting for un responded transactions.

6. The net exchange difference resulting from the translation of items in the financial statements of a foreign branch should be recognized as income or as expense for the period, except to the extent adjusted in the carrying amount of the related fixed assets in accordance with paragraph 4.

7. Contingent liabilities should be translated into the reporting currency of the enterprise at the closing rate. The translation of contingent liabilities does not result in any exchange difference as defined in this statement.

8. An enterprise should disclose:

    (i)   The amount of exchange differences included in the net profit or loss for the period.

    (ii)   The amount of exchange differences adjusted in the carrying amount of fixed assets during the accounting period; and

    (iii)   The amount of exchange differences in respect of forward exchange contracts to be recognized in the profit or loss for one or more subsequent accounting periods, as required by Forward Exchange Contracts.

Study Note — 2

FINANCIAL MANAGEMENT DECISIONS

2.1 Capital Structure Theory

This Section includes

- **Theories of Capital Structure**

INTRODUCTION :

The capital structure of a company refers to a combination of the long-term finances used by the firm. The theory of capital structure is closely related to the firm's cost of capital. The decision regarding the capital structure or the financial leverage or the financing is based on the objective of achieving the maximization of shareholders wealth.

To design capital structure, we should consider the following two propositons :

(i) Wealth maximization is attained.

(ii) Best approximation to the optimal capital structure.

Factors Determining Capital Structure

(1) **Minimization of Risk :** (a) Capital structure must be consistent with business risk.

                              (b) It should result in a certain level of financial risk.

(2) **Control :** It should reflect the management's philosophy of control over the firm.

(3) **Flexibility :** It refers to the ability of the firm to meet the requirements of the changing situations.

(4) **Profitability :** It should be profitable from the equity shareholders point of view.

(5) **Solvency :** The use of excessive debt may threaten the solvency of the company.

Process of Capital Structure Decisions
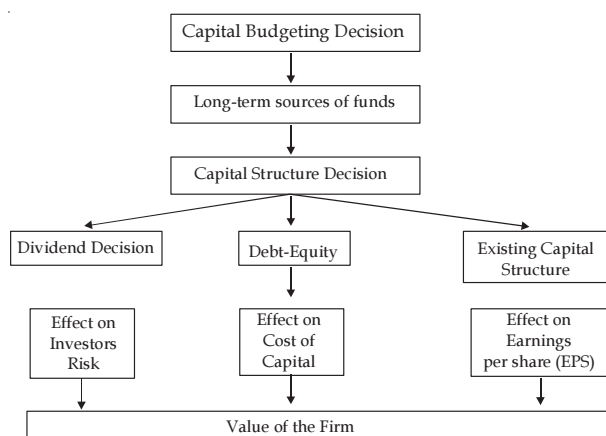
THEORIES OF CAPITAL STRUCTURE :

Equity and debt capital are the two major sources of long-term funds for a firm. The theories of capital structure suggests the proportion of equity and debt in the capital structure.

Assumptions

(i) There are only two sources of funds, i.e., the equity and the debt, having a fixed interest.

(ii) The total assets of the firm are given and there would be no change in the investment decisions of the firm.

(iii) EBIT (Earnings Before Interest & Tax)/NOP (Net Operating Profits) of the firm are given and is expected to remain constant.

(iv) Retention Ratio is NIL, i.e., total profits are distributed as dividends. [100% dividend pay-out ratio]

(v) The firm has a given business risk which is not affected by the financing decision.

(vi) There is no corporate or personal taxes.

(vii) The investors have the same subjective probability distribtuion of expected operating profits of the firm.

(viii) The capital structure can be altered without incurring transaction costs.

In discussing the theories of capital structure, we will consider the following notations :

E = Market value of the Equity

D = Maket value of the Debt

V = Market value of the Firm = E +D

I = Total Interest Payments

T = Tax Rate

EBIT/NOP = Earnings Before Interest and Tax/Net Operating Profit

PAT = Profit After Tax

D_0 = Dividend at time 0 (i.e. now)

D_1 = Expected dividend at the end of Year 1.

P_o = Current Market Price per share

P_1 = Expected Market Price per share at the end of Year 1.

K_d = Cost of Debt after Tax $\left[\dfrac{I(1-T)}{D}\right]$

K_e = Cost of Equity $\left[D_1\middle/P_0\right]$

K_0 = Overall cost of capital i.e., WACC

$$= K_d\left(\frac{D}{D+E}\right) + K_e\left(\frac{E}{D+E}\right)$$

$$= K_d\left(\frac{D}{V}\right) + K_e\left(\frac{E}{V}\right) = \frac{K_d D}{V} + \frac{K_e E}{V} = \frac{K_d D + K_e E}{V}$$

$$= \frac{EBIT}{V}$$

Different Theories of Capital Structure
   (1) Net Income (NI) appoarch
   (2) Net Operating Income (NOI) Approach
   (3) Traditional Approach
   (4) Modigliani-Miller Model
                   (a) without taxes
                   (b) with taxes.

Net Income Approach

As suggested by David Durand, this theory states that there is a relationship between the Capital Structure and the value of the firm.

Assumptions
   (1) Toal Capital requirement of the firm are given and remain constant
   (2) $K_d < K_e$
   (3) K_d and K_e are constant
   (4) K_o decreases with the increase in leverage.
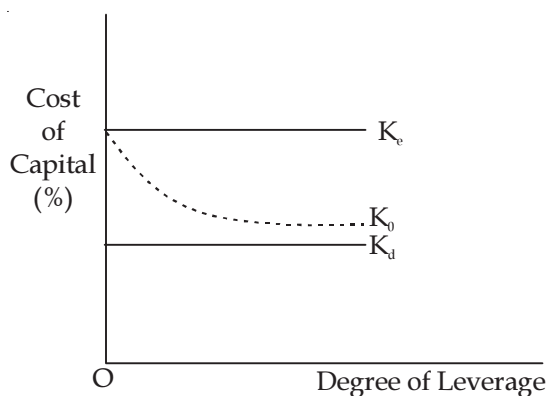
Illustration

	Firm A	Firm B
Earnings Before Interest and Tax (EBIT)	2,00,000	2,00,000
Interest (I)	—	50,000
Equity Earnings (E_e)	2,00,000	1,50,000
Cost of Equity (K_e)	12%	12%
Cost of Debt (K_d)	10%	10%
Market Value of Equity (E) $= \dfrac{E_e}{K_e}$	16,66,667	12,50,000
Market Value of Debt (D) $= \dfrac{I}{K_d}$	NIL	5,00,000
Total Value of the Firm [E+D]	16,66,667	17,50,000
Overall cost of capital (K_o) $= \dfrac{EBIT}{E+D}$	12%	11.43%

Net Operating Income (NOI) Approach

According to David Durand, under NOI approach, the total value of the firm will not be affected by the composition of capital structure.

Assumptions

(1) K_0 and K_d are constant.

(2) K_e will change with the degree of leverge.

(3) There is no tax.
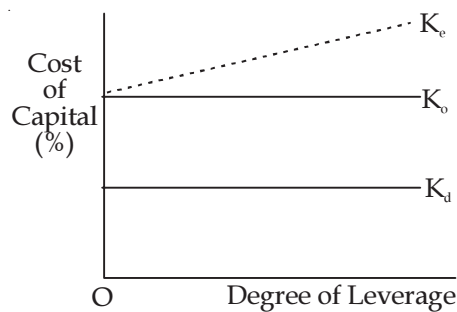
Illustration

A firm has an EBIT of Rs. 5,00,000 and belongs to a risk class of 10%. What is the cost of Equity if it employs 6% debt to the extent of 30%, 40% or 50% of the total capital fund of Rs. 20,00,000 ?

Solution

	30%	40%	50%
Debt (Rs.)	6,00,000	8,00,000	10,00,000
Equity (Rs.)	14,00,000	12,00,000	10,00,000
EBIT (Rs.)	5,00,000	5,00,000	5,00,000
K_o	10%	10%	10%
Value of the Firm (V) (Rs.) (EBIT/K_o)	50,00,000	50,00,000	50,00,000
Value of Equity (E) (Rs.) (V–D)	44,00,000	42,00,000	40,00,000
Interest @ 6% (Rs.)	36,000	48,000	60,000
Net Profit (EBIT–Int.) (Rs.)	4,64,000	4,52,000	4,40,000
K_e (NP/E)	10.545%	10.76%	11%

Traditional Approach :

It takes a mid-way between the NI approach and the NOI approach.

Assumptions

   (i) The value of the firm increases with the increase in financial leverage, upto a certain limit only.

  (ii) K_d is assumed to be less than K_e.
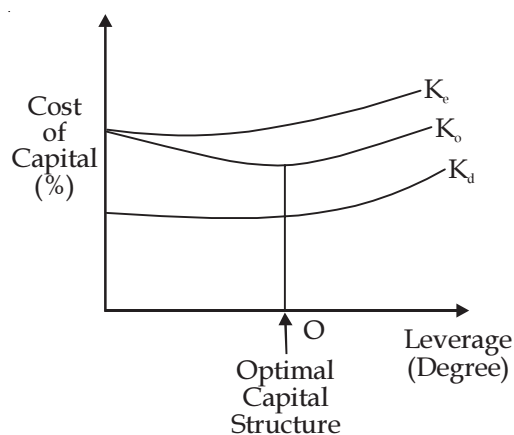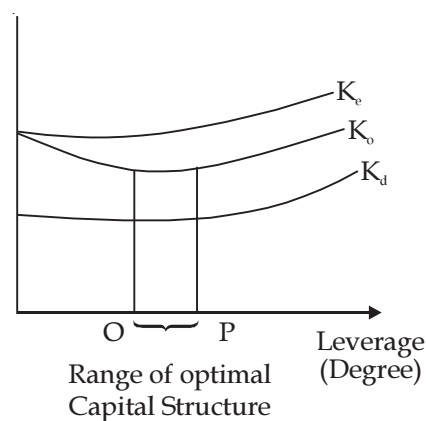
(Part-I)   (Part-II)

Traditional viewpoint on the Relationship
between Leverage, Cost of Capital
and the Value of the Firm

Modigliani – Miller (MM) Hypothesis

The Modigliani – Miller hypothesis is identical with the Net Operating Income approach. Modigliani and Miller argued that, in the absence of taxes the cost of capital and the value of the firm are not affected by the changes in capital structure. In other words, capital structure decisions are irrelevant and value of the firm is independent of debt – equity mix.

Basic Propositions

M - M Hypothesis can be explained in terms of two propositions of Modigliani and Miller. They are :

   i. The overall cost of capital (K_O) and the value of the firm are independent of the capital structure. The total market value of the firm is given by capitalising the expected net operating income by the rate appropriate for that risk class.

  ii. The financial risk increases with more debt content in the capital structure. As a result cost of equity (K_e) increases in a manner to offset exactly the low – cost advantage of debt. Hence, overall cost of capital remains the same.

Assumptions of the MM Approach

1. There is a perfect capital market. Capital markets are perfect when

    i)   investors are free to buy and sell securities,

    ii)   they can borrow funds without restriction at the same terms as the firms do,

    iii)   they behave rationally,

    iv)   they are well informed, and

    v)   there are no transaction costs.

2. Firms can be classified into homogeneous risk classes. All the firms in the same risk class will have the same degree of financial risk.

3. All investors have the same expectation of a firm's net operating income (EBIT).

4. The dividend payout ratio is 100%, which means there are no retained earnings.

5. There are no corporate taxes. This assumption has been removed later.

Preposition I

According to M – M, for the firms in the same risk class, the total market value is independent of capital structure and is determined by capitalising net operating income by the rate appropriate to that risk class. Proposition I can be expressed as follows:

$$V = S + D = \frac{X}{K_o} = \frac{NOI}{K_o}$$

Where, V   =   the market value of the firm

   S   =   the market value of equity

   D   =   the market value of debt

According the proposition I the average cost of capital is not affected by degree of leverage and is determined as follows:

$$K_o = \frac{X}{V}$$

According to M –M, the average cost of capital is constant as shown in the following Fiure.
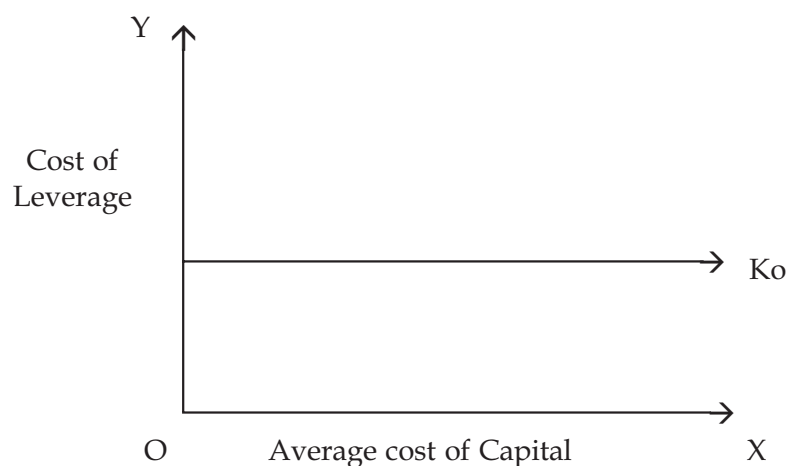
Arbitrage Process

According to M –M, two firms identical in all respects except their capital structure, cannot have different market values or different cost of capital. In case, these firms have different market values, the arbitrage will take place and equilibrium in market values is restored in no time. Arbitrage process refers to switching of investment from one firm to another. When market values are different, the investors will try to take advantage of it by selling their securities with high market price and buying the securities with low market price. The use of debt by the investors is known as personal leverage or home made leverage.

Because of this arbitrage process, the market price of securities in higher valued market will come down and the market price of securities in the lower valued market will go up, and this switching process is continued until the equilibrium is established in the market values. So, M –M, argue that there is no possibility of different market values for identical firms.

Reverse Working Of Arbitrage Process

Arbitrage process also works in the reverse direction. Leverage has neither advantage nor disadvantage. If an unlevered firm (with no debt capital) has higher market value than a levered firm (with debt capital) arbitrage process works in reverse direction. Investors will try to switch their investments from unlevered firm to levered firm so that equilibrium is established in no time.

Thus, M – M proved in terms of their proposition I that the value of the firm is not affected by debt-equity mix.

Proposition II

M – M's proposition II defines cost of equity. According to them, for any firm in a given risk class, the cost of equity is equal to the constant average cost of capital ($_{Ko}$) plus a premium for the financial risk, which is equal to debt – equity ratio times the spread between average cost and cost of debt. Thus, cost of equity is:

$$K_e = K_o + (K_o - K_d)\frac{D}{S}$$

Where, K_e = cost of equity

K_d = Cost of Debt

D/S = debt – equity ratio

M – M argue that K_0 will not increase with the increase in the leverage, because the low – cost advantage of debt capital will be exactly offset by the increase in the cost of equity as caused by increased risk to equity shareholders. The crucial part of the M – M Thesis is that an excessive use of leverage will increase the risk to the debt holders which results in an increase in cost of debt (K_0). However, this will not lead to a rise in K_o. M – M maintain that in such a case K_e will increase at a decreasing rate or even it may decline. This is because of the reason that at an increased leverage, the increased risk will be shared by the debt holders. Hence K_o remain constant. This is illustrated in the figure given below :
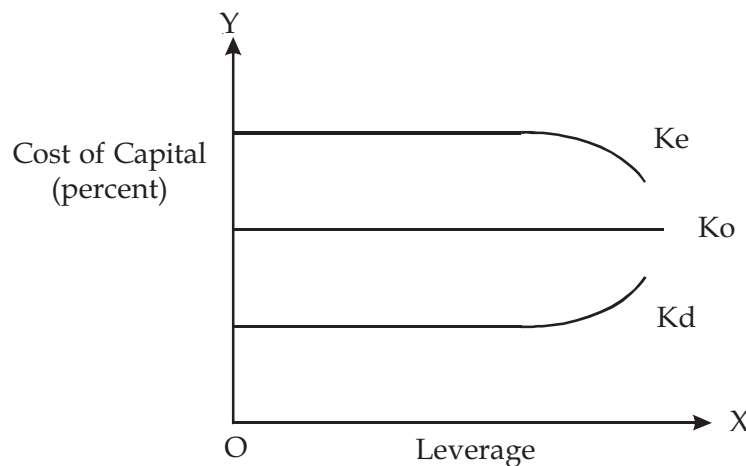
M M Hypothesis and cost of capital

Criticism Of M M Hypothesis

The arbitrage process is the behavioural and operational foundation for M M Hypothesis. But this process fails the desired equilibrium because of the following limitations.

1. Rates of interest are not the same for the individuals and firms. The firms generally have a higher credit standing because of which they can borrow funds at a lower rate of interest as compared to individuals.
2. Home – Made leverage is not a perfect substitute for corporate leverage. If the firm borrows, the risk to the shareholder is limited to his shareholding in that company. But if he borrows personally, the liability will be extended to his personal property also. Hence, the assumption that personal or home – made leverage is a perfect substitute for corporate leverage is not valid.
3. The assumption that transaction costs do not exist is not valid because these costs are necessarily involved in buying and selling securities.
4. The working of arbitrage is affected by institutional restrictions, because the institutional investors are not allowed to practice home – made leverage.
5. The major limitation of M – M hypothesis is the existence of corporate taxes. Since the interest charges are tax deductible, a levered firm will have a lower cost of debt due to tax advantage when taxes exist.

M – M Hypothesis Corporate Taxes

Modigliani and Miller later recognised the importance of the existence of corporate taxes. Accordingly, they agreed that the value of the firm will increase or the cost of capital will decrease with the use of debt due to tax deductibility of interest charges. Thus, the optimum capital structure can be achieved by maximising debt component in the capital structure.

According to this approach, value of a firm can be calculated as follows:

Value of Unlevered firm $(Vu) = \dfrac{EBIT}{K_o}(I - t)$

Where, EBIT = Earnings before interest and taxes

$\quad\quad K_o$ = Overall cost of capital

$\quad\quad t$ = Tax rate.

$\quad\quad I$ = Interest on debt capital

2.2 Cost Of Capital

This Section includes :

- **Cost of Capital-Key Concepts**
- **Importance**
- **Classification**
- **Determination**
- **Computation**
- **Weighted Average Cost of Capital**

INTRODUCTION :

It has been discussed in lesson -4 that for evaluating capital investment proposals according to the sophisticated techniques like Net Present Value and Internal Rate of Return, the criterion used to accept or reject a proposal is the cost of capital. The cost of capital plays a significant role in capital budgeting decisions. In the present lesson the concept of cost of capital and the methods for its computation are explained.

COST OF CAPITAL-KEY CONCEPTS :

The term cost of capital refers to the minimum rate of return a firm must earn on its investments. This is in consonance with the firm's overall object of wealth maximization. Cost of capital is a complex, controversial but significant concept in financial management.

The following definitions give clarity management.

Hamption J. : The cost of capital may be defined as "the rate of return the firm requires from investment in order to increase the value of the firm in the market place".

James C. Van Horne : The cost of capital is "a cut-off rate for the allocation of capital to investments of projects. It is the rate of return on a project that will leave unchanged the market price of the stock".

Soloman Ezra : "Cost of Capital is the minimum required rate of earinings or the cut-off rate of capital expenditure".

It is clear from the above difinitions that the cast of capital is that minimum rate of return which a firm is expected to earn on its investments so that the market value of its share is maintained. We can also conclude from the above definitions that there are three basic aspects of the concept of cost of capital :

i) **Not a cost as such:** In fact the cost of capital is not a cost as such, it is the rate of return that a firm requires to earn from its projects.

ii) **It is the minimum rate of return:** A firm's cost of capital is that minimum rate of return which will at least maintain the market value of the share.

iii) It comprises three components :

$$K = r_o + b + f$$

Where, k = cost of capital;

r_o = return at zero risk level:

b = premium for business risk, which refers to the variability in operating profit (EBIT) due to change in sales.

f = premium for financial risk which is related to the pattern of capital structure.

IMPORTANCE OF COST OF CAPITAL :

The cost of capital is very important in financial management and plays a crucial role in the following areas :

i) **Capital budgeting decisions :** The cost of capital is used for discounting cash flows under Net Present Value method for investment proposals. So, it is very useful in capital budgeting decisions.

ii) **Capital structure decisions :** An optimal capital structure is that structure at which the value of the firm is maximum and cost of capital is the lowest. So, cost of capital is crucial in designing optimal capital structure.

iii) **Evaluation of financial performance :** Cost of capital is used to evaluate the financial performance of top management. The actual profitabily is compared to the expected and actual cost of capital of funds and if profit is greater than the cost of capital the performance nay be said to be satisfactory.

iv) **Other financial decisions :** Cost of capital is also useful in making such other financial decisions as dividend policy, capitalization of profits, making the rights issue, etc.

CLASSIFICATION OF COST OF CAPITAL :

Cost of capital can be classified as follows :

i) **Historical Cost and Future Cost :** Historical costs are book costs relating to the past, while future costs are estimated costs act as guide for estimation of future costs.

ii) **Specific Costs and Composite Costs :** Specific cost is the cost of a specific source of capital, while composite cost is combined cost of various sources of capital. Composite cost, also known as the weighted average cost of capital, should be considered in capital and capital budgeting decisions.

iii) **Explicit and Implicit Cost :** Explicit cost of any source of finance is the discount rate which equates the present value of cash inflows with the present value of cash outflows. It is the internal rate of return and is calculated with the following formula;

$$I_O = \frac{C_1}{(I+K)^1} + \frac{C_2}{(I+K)^2} + ... + \frac{C_n}{(I+K)^n}$$

I_o = Net cash inflow received at zero of time

C = Cash outflows in the period concerned

K = Explicit cost of capital

N = Duration of time period

Implicit cost also known as the opportunity cost is the opportunity foregone in order to take up a particular project. For example, the implicit cost of retained earings is the rate of return available to shareholders by investing the funds elsewhere.

iv) **Average Cost and Marginal Cost :** An average cost is the combined cost or weighted average cost of various sources of capital. Marginal cost refers to the average cost of capital of new or additional funds required by a firm. It is the marginal cost which should be taken into consideration in investment decisions.

DETERMINATION OF COST OF CAPITAL :

As stated already, cost of capital plays a very important role in making decisions relating to financial management. It involves the following problems.

Problems in determination of cost of capital :

i) Conceptual controversy regarding the relationship between cost of capital and capital structure is a big problem.

ii) Controversy regarding the relevance or otherwise of historic costs or future costs in decision making process.

iii) Computation of cost of equity capital depends upon the excepted rate of return by its investors. But the quantification of expectations of equity shareholders is a very difficult task.

iv) Retained earnings has the opportunity cost of dividends forgone by the share-holders. Since different shareholders may have different opportunities for reinvesting dividends, it is very difficult to compute cost of retained earnings.

v) Whether to use book value or market value weights in determining weighted average cost of capital poses another problem.

COMPUTATION OF COST OF CAPITAL :

Computation of cost capital of a firm involves the following steps :

i) Computation of cost of specific sources of a capital, viz., debt, preference capital, equity and retained earnings, and

ii) Computation of weighted average cost of capital.

Cost of Debt (k_d)

Debt may be perpetual or redeemable debt. Moreover, it may be issued at par, at premium or discount. The computation of cost of debt in each is explained below.

Perpetual / irredeemable debt :

K_d = Cost of debt before tax = I/P_o

K_d = Cost of debt; I= interest; P_o = net proceeds

k_d(after-tax) = $I/P(1-t)$

Where t = tax rate

Example

Y Ltd issued Rs. 2,00,000, 9% debentures at a premium of 10%. The costs of floatation are 2%. The tax rate is 50%. Compute the after tax cost of debt.

Answer : k_d (after-tax) = $\dfrac{I}{NP}(1-t) = \dfrac{Rs.\,18,000}{Rs.\,2,15,600}(1-0.5) = 4.17\%$

[net proceeds = Rs. 2,00,000 + 20,000 – (2/100×2,20,000)]

Redeemable debt

The debt repayable after a certain period is known as redeemable debt. Its cost computed by using the following formula :

i) Before – tax cost of debt = $\dfrac{I + 1/n\,(P - NP)}{\frac{1}{2}\,(P + NP)}$

I = interest : P = proceeds at par;

NP = net proceeds; n = No. of years in which debt is to be redeemed

ii) After tax cost of debt = Before – tax cost of debt × (1-t)

Example

A company issued Rs. 1,00,000, 10% redeemble debentures at a discount of 5%. The cost of floatation amount to Rs. 3,000. The debentures are redeemable after 5 years. Compute before – tax and after – tax cost of debt. The tax rate is 50%.

Solution :

i) Before – tax cost of debt $= \dfrac{I + 1/n \, (P\text{-}NP)}{\frac{1}{2} \, (P\text{+}NP)}$

$= \dfrac{10{,}000 + 1/5(1{,}00{,}000\text{-}92{,}000)}{\frac{1}{2} \, (1{,}00{,}000\text{+}92{,}000)}$

$= \dfrac{10{,}000 + 1{,}600}{96{,}000} = \dfrac{11{,}600}{96{,}000} = 12.08\%$

[NP = 1,00,000 – 5,000 – 3,000 = 92,000]

After tax cost of debt = Before – tax cost x (1-t) = 12.08 X (1-.5) = 6.04%

Cost of Preference Capital (k_p)

In case of preference share dividend are payable at a fixed rate. However, the dividends are not allowed to be deducted for computation of tax. So no adjustment for tax is required. Just like debentures, preference share may be perpetual or redeemable. Further, they may be issued at par, premium or discount.

Perpetual Preference Capital

i)   If issued at par ; $K_p = D/P$

   K_p = Cost of preference capital

   D = Annual preference dividend

   P = Proceeds at par value

ii) If issued at premium or discount

   $K_p = D/NP$ Where NP = net proceeds.

Example :

A company issued 10,000, 10% preference share of Rs. 10 each, Cost of issue is Rs. 2 per share. Calculate cost of capital if these shares are issued (a) at par, (b) at 10% premium, and (c) at 5% discount.

Solutions : Cost of preference capital, (K_p) = D/NP

a) When issued at par :

$$K_p = \frac{Rs.\,10{,}000}{1{,}00{,}000 - 20{,}000} \times 100 = \frac{10{,}000}{80{,}000} \times 100 = 12.5\%$$

[Cost of issue = 10,000 × Rs. 2 = Rs. 20,000]

b) When issued at 10% premium :

$$K_p = \frac{\text{Rs. } 10,000}{1,00,000 + 10,000 - 20,000} \times 100 = \frac{10,000}{90,000} \times 100 = 11.11\%$$

c) When issued at 5% discount :

$$K_p = \frac{\text{Rs. } 10,000}{1,00,000 - 5,000 - 20,000} \times 100 = \frac{10,000}{75,000} \times 100 = 13.33\%$$

Redeemable preference shares - It is calculated with the following formula :

$$K_p = \frac{D + (MV - NP)\frac{1}{n}}{\frac{1}{2}(MV + NP)}$$

Where, K_p = Cost of preference capital

   D = Annual preference dividend

   MV = Maturity value of preference shares

   NP = Net proceeds of preference shares

   n = Maturity Period

Example :

A company issues 1,00,000, 10% preference share of Rs. 10 each. Calculate the cost of preference capital if it is redeemable after 10 years and issued.

   a) At par   b) at 5% premium

Solution :

$$K_p = \frac{D + 1/n\,(MV - NP)}{\frac{1}{2}(MV + NP)} \times 100$$

a) Cost of preference capital, if redeemable at par :

$$K_p = \frac{\text{Rs. } 1,00,000 + 1/10\,(10,00,000 - 10,00,000)}{\frac{1}{2}(10,00,000 + 10,00,000)} \times 100 = \frac{\text{Rs. } 1,00,000}{\text{Rs. } 10,00,000} \times 100 = 10\%$$

b) If redeemable at a premium of 5%

$$K_p = \frac{\text{Rs. } 1,00,000 + 1/10\,(10,50,000 - 10,00,000)}{\frac{1}{2}(10,50,000 + 10,00,000)} \times 100$$

$$= \frac{\text{Rs. } 1,00,000 + 5,000}{\text{Rs. } 10,25,000} \times 100 = \frac{\text{Rs. } 1,05,000}{\text{Rs. } 10,25,000} \times 100 = 10.24\%$$

Cost of Equity capital

Cost of Equity is the expected rate of return by the equity shareholders. Some argue that, as there is no legal compulsion for payment, equity capital does not involve any cost. But it is not correct. Equity shareholders normally expect some dividend from the company while making investment in shares. Thus, the rate of return expected by them becomes the cost of equity. Conceptually, cost of equity share capital may be defined as the minimum rate of return that a firm must earn on the equity part of total investment in a project in order to leave unchanged the market price of such shares. For the determination of cost of equity capital it may be divided into two categories:

   i) External equity or new issue of equity shares.

   ii) Retained earnings.

The cost of external equity can be computed as per the following approaches :

Dividend Yield / Dividend Price Approach : According to this approach, the cost of equity will be that rate of expected dividends which will maintain the present market price of equity shares. It is calculated with the following formula :

    Ke = D/NP (for new equity shares)

Or

    Ke = D/MP (for existing shares)

Where,

    Ke = Cost of equity

    D = Expected dividend per share

    NP = Net proceeds per share

    MP = Market price per share

This approach rightly recognizes the importance of dividends. However, it ignores the importance of retained earnings on the market price of equity shares. This method is suitable only when the company has stable earnings and stable dividend policy over a period of time.

Example :

A company issues, 10,000 equity shares of Rs. 100 each at a premium of 10%. The company has been paying 20% dividend to equity shareholders for the past five years and expected to maintain the same in the future also. Compute cost of equity capital. Will it make any difference if the market price of equity share is Rs. 150 ?

Solution :

$$Ke = \frac{D}{NP} = \frac{Rs.20}{Rs.110} \times 100 = 18.18\%$$

If the market price per share =Rs.150

$$Ke = \frac{D}{MP} = \frac{Rs.20}{Rs.150} \times 100 = 13.33\%$$

Dividend yield plus Growth in dividend methods

According to this method, the cost of equity is determined on the basis of the expected dividend rate plus the rate of growth in dividend. This method is used when dividends are expected to grow at a constant rate.

Cost of equity is calculated as :

Ke = D_1 /NP +g (for new equity issue)

Where,

D_1 = expected dividend per share at the end of the year. [D_1 = $D_o(1+g)$]

NP = net proceeds per share

g = growth in dividend for existing share is calculated as:

D_1 / MP + g

Where,

MP = market price per share.

Example :

ABC Ltd plans to issue 1,00,000 new equity share of Rs. 10 each at par. The floatation costs are expected to be 5% of the share price. The company pays a dividend of Rs. 1 per share and the growth rate in dividend is expected to be 5%. Compute the cost of new equity share. If the current market price is Rs. 15, compute the cost of existing equity share.

Solution :

Cost of new equity shares = (K_e) = D/NP +g

K_e = 1 / (10-0.5) + 0.05 = 1 / 9.5 + 0.05

= 0.01053 + 0.05

= 0.1553 or 15.53%

Cost of existing equity share: k_e = D / MP + g

K_e = 1/ Rs. 15 + 0.05 = 0.0667 or 11.67%

Earnings Yield Method - According to this approach, the cost of equity is the discount rate that capitalizes a stream of future earnings to evaluate the shareholdings. It is computed by taking earnings per share (EPS) into consideration. It is calculated as :

i) K_e = Earnings per share / Net proceeds = EPS / NP [For new share]

ii) K_e = EPS / MP [For existing equity]

Example

XYZ Ltd is planning for an expenditure of Rs. 120 lakhs for its expansion programme. Number of existing equity shares are 20 lakhs and the market value of equity shares is Rs. 60. It has net earnings of Rs. 180 lakhs.

Compute the cost of existing equity share and the cost of new equity capital assuming that new share will be issued at a price of Rs. 52 per share and the costs of new issue will be Rs. 2 per share.

Solutions :

a)   Cost of existing equity = $(K_e) = \dfrac{EPS}{MP}$

Earnings per share (EPS) = $\dfrac{1,80,00,000}{20,00,000}$ = Rs. 9

K_e =9/60=0.15 or 15%

b)   Cost of new equity capital (K_e) = EPS/NP=9/52-2=9/50=0.18 or 18%

Cost of Retained Earnings (K_r)

Retained earnings refer to undistributed profits of a firm. Out of the total earnings, firms generally distribute only part of them in the form of dividends and the rest will be retained within the firms. Since no dividend is required to paid on retained earnings, it is stated that 'retained earnings carry no cost'. But this approach is not appropriate. Retained earnings has the opportunity cost of dividends in alternative investment, which becomes cost of retained earnings. Hence, shareholders expect a return on retained earnings at least equity.

$K_r = K_e$ = D/NP+g

However, while calculating cost of retained earnings, two adjustments should be made :

a) Income-tax adjustment as the shareholders are to pay some income tax out of dividends, and b) adjustment for brokerage cost as the shareholders should incur some brokerage cost while invest dividend income. Therefore, after these adjustments, cost of retained earnings is calculated as :

$K_r = K_e$ (1-t)(1-b)

Where, K_r = cost of retained earnings

K_e = Cost of equity

t = rate of tax

b = cost of purchasing new securities or brokerage cost.

Example

A firm 's cost of equity (K_e) is 18%, the average income tax rate of shareholders is 30% and brokerage cost of 2% is excepted to be incurred while investing their dividends in alternative securities. Compute the cost of retained earnings.

Solution : Cost of retained earnings = (K_r) = K_e (1-t)(1-b)=18(1-.30)(1-.02)

=18x.7x.98=12.35%

Cost of Rights Issue

Rights issue is an invitation to the existing shareholders to subscribe for further shares to be issued by a company. A right simply means an option to buy certain shares at a privileged price which is considerably below the market price. It is generally felt that the cost of rights issue would be different from the cost of direct issue. But for two reasons, the real cost of rights issue would be the same as the cost of direct issue of share to the public.

   i)   The shareholder who is not interested in the rights issue, sells his rights and obtain cash. Then he has the old share plus the money obtained from selling the rights.

   ii)   Otherwise, the shareholder exercise his rights and acquires the new share, in addition to the old shares.

Thus, the present wealth of the shareholders in both the cases remains the same.

Cost of Convertible Securities

Convertible securities or debentures are another type of instruments for mobilization of debt capital. In this case the debenture holder is entitled to full or a part of the value of the debenture being converted into equity shares. The price at whch the debenture is convertible into share is known as "conversion price". This conversion price is declares at the time of the issue of debentures itself.

When the bondholder exercises his option of conversion, he enjoys two benefits-interest on bonds till the date of conversion and increased market value of share at the time of conversion. Hence, the cost of convertible securities is taken to be that rate of discount which equates the after-tax interest and the expected market value of the share at the end option period, with the current market value of bond.

This is calculated with the help of following formula :

$$P_o = \sum$$

Where,

P_o = Current market value of debenture

I = Interest

t = tax rate

K_o = Rate of discount or cost of convertible security.

n = no. of years at the end of which conversion takes place.

CR = conversion or the no. of share the bond – holder gets on conversion

WEIGHTED AVERAGE COST OF CAPITAL :

It is the average of the costs of various sources of financing. It is also known as composite or overall or average cost of capital.

After computing the cost of individual sources of finance, the weighted average cost of capital is calculated by putting weights in the proportion of the various sources of funds to the total funds.

Weighted average cost of capital is computed by using either of the following two types of weights :

      1)   Market value   2)   Book Value

Market value weights are sometimes preferred to the book value weights as the market value represents the true value of the investors. However, market value weights suffer from the following limitations :

i)   Market value are subject to frequent fluctuations.

ii)   Equity capital gets more importance, with the use of market value weights.

Moreover, book values are readily available.

Average cost of capital is computed as followings :

$$Kw = \frac{\sum x}{\sum w}$$

Where, Kw = weighted average cost of capital

        X = cost of specific sources of finance

        W = weights (proportions of specific sources of finance in the total)

The following steps are involved in the computation of weighted average cost of capital :

  i) Multiply the cost of each sources with the corresponding weight.

  ii) Add all these weighted costs so that weighted average cost of capital is obtained.

Illustration 1 : Cost of Irredeemable Debentures :

Borrower Ltd. issued 10,000, 10% Debentures of Rs. 100 each on 1st April. The cost of issue was Rs. 25,000. The Company's tax rate is 35%. Determine the cost of debentures if they were issued (a) at par (b) at a premium of 10% and (c) at a discount of 10%

Solution :

Particulars	Par	Premium	Discount
Gross Proceeds	10,000×100=10,00,000	10,000×110=11,00,000	10,000×90=9,00,000
Less : Cost of Issue	25,000	25,000	25,000
Net Proceeds	**9,75,000**	**10,75,000**	**8,75,000**
Interest at 10%	1,00,000	1,00,000	1,00,000
Less : Tax at 35%	35,000	35,000	35,000
Net Outflow	**65,000**	**65,000**	**65,000**
$K_d = \dfrac{\text{Interest (after tax)}}{\text{Net Proceeds}}$	**6.67%**	**6.05%**	**7.43%**

Illustration 2 : Cost of Redeemable Debentures

Indebted Ltd issued 10,000, 10% Debentures of Rs. 100 each, redeemable in 10 years time at 10% premium. The cost of issue was Rs. 25,000. The Company's Income Tax Rate is 35%. Determine the cost of debentures if they were issued (a) at par (b) at a premium of 10% and (c) at a discount of 10%.

Solution :

Particulars	Par	Premium	Discount
1. Gross Proceeds	10,000×100	10,000×110	10,000×90 =
	10,00,000	11,00,000	9,00,000
2. Cost of Issue	25,000	25,000	25,000
3. Net Proceeds (1–2)	9,75,000	10,75,000	8,75,000
4. Redemption Value (Face Value+10% premium)	11,00,000	11,00,000	11,00,000
5. **Average Liability (RV+NP) ÷ (2) = (4+3) ÷ 2**	**10,37,500**	**10,87,500**	**9,87,500**
6. Premium on Redemption = RV – NP	1,25,000	25,000	2,25,000
7. Avg Premium on Redemption p.a. = (6) ÷ 10 yrs.	12,500	2,500	22,500
8. Interest payable at 10% of Face Value	1,00,000	1,00,000	1,00,000
9. After Tax Interest at 65% (Since Tax = 35%)	65,000	65,000	65,000
10. **Average Annual Payout = (7+9)**	**77,500**	**67,500**	**87,500**
11. $K_d = \dfrac{\text{Interest (after tax)} + \text{Avg Premium on Red}}{\text{Average Liability}}$	7.47%	6.21%	8.86%

Note : Cost of Debt will not be equal to the Interest Rate on Debt. This is due to the following reasons—

(a) Tax-Saving Effect :

(b) Issue at Premium/Discount :

(c) Expenses of Issue and difference between Face Value and Net Proceeds;

(d) Redemption at premium and additional amount payable.

Illustration 3 : Alternative Modes of Debt

Company is considering raising funds of about Rs. 100 Lakhs by one of two alternative methods, viz. 14% Substitutional Term Loan and 13% Non-Convertible Debentures. The term loan option would attract no major accidental cost. The Debentures would be issued at a discount of 2.5% and would involve cost of issue Rs. 1 lakh. Advice the company as to the better option based on effective cost of capital. Assume a tax rate of 50%.

Solution : (information in Rs. Lakhs)

Mode	Term Loan	Debentures
Gross Realisation	100.00	100×97.5%=97.50
Less : Cost of Issue	–	1.00
Net Proceeds	**100.00**	**96.50**
Interest Payale at 14% and 13% of Face Value	14.00	13.00
Interest × After tax rate=Annual Payout	7.00	6.50
Effective K_d Interest (after tax)/ Net Proceeds	7%	6.74%
Ranking	II	I

Note : Based on Effective K_d, Debentures can be preferred. But net realisation is only Rs. 96.5 Lakhs. If fund requirement of Rs. 100 Lakhs is considered as the base, the Face Value of Debentures to be issued. [Rs. 100 Lakhs (Net Proceeds) + 1 Rs. 1 Lakh (Cost of Issue)]/ 97.5% (issured at a discount). Hence, Face Value of Debentures issued Rs. 103.59 Lakhs approximately. Effective Cost of Debentures in that case = **6.73%**.

Illustration 4 : Cost of Irredeemable Preference Shares

Preferred Ltd issued 30,000, 15% Preference Shares of Rs. 100 each. The cost of issue was Rs. 30,000. Determine the cost of Preference Capital if shares are issued (a) at par (b) at a premium of 10% and (c) at a discount of 10%.

Solution :

Particular	Par	Premium	Discount
Gross Proceeds	30,000×100 = 30,00,000	30,000 × 110 = 33,00,000	30,000×90 = 27,00,000
Less : Cost of Issue	30,000	30,000	30,000
Net Proceeds	**29,70,000**	**32,70,000**	**26,70,000**
Preference Dividend 15%	4,50,000	4,50,000	4,50,000
$K_p = \dfrac{\text{Preference Dividend}}{\text{Net Proceeds}}$	**15.15%**	**13.76%**	**16.85%**

Illustration 5 : Cost of Redeemable Preference Shares.

Preferential Ltd. issued 30,000, 15% Preference Shares of Rs. 100 each, redeemable at 10% premium after 20 years. Issue Management Expenses were Rs. 30,000. Find out cost of Preference Capital if shares are issued (a) at par (b) at a premium of 10% and (c) at a discount of 10%.

Solution :

Particulars	Par	Premium	Discount
1. Gross Proceeds (30,000 Shares × Issue Price)	30,00,000	33,00,000	27,00,000
2. Cost of Issue	30,000	30,000	30,000
3. Net Proceeds = (1–2)	29,70,000	32,70,000	26,70,000
4. Redemption Value (Face Value+10% premium)	33,00,000	33,00,000	33,00,000
5. **Average Liability (RV+NP) ÷ 2 = (4+3) ÷ 2**	**31,35,000**	**32,85,000**	**29,85,000**
6. Premium on Redemption = RV – NP	3,30,000	30,000	6,30,000
7. Avg Premium on Redemption p.a. ÷ 20 yrs.	16,500	1,500	31,500
8. Dividend at 15% of Face Value	4,50,000	4,50,000	4,50,000
9. **Average Annual Payout = (7+8)**	**4,66,500**	**4,51,500**	**4,81,500**
10. K_p = 9 : 5	**14.88%**	**13.74%**	**16.13%**

Illustration 6 : Cost of Equity — Dividend Price Approach

Dividend–Payers Ltd has a stable income and stable dividend policy. The average annual dividend payout is Rs. 27 per share (Face Value = Rs. 100). You are required to find out –

(1) Cost of Equity Capital if Market Price in Year 1 is Rs. 150.

(2) Expected Market Price in Year 2 if cost of equity is expected to rise to 20%

(3) Dividend Payout in Year 2 if the Company were to have an expected market price of Rs. 160 per share, at the existing cost of equity.

Solution :

1. $K_e = \dfrac{\text{Dividend per Share}}{\text{Market Price per Share}} = \dfrac{\text{Rs. } 27}{\text{Rs. } 150} = \mathbf{18}\%$

2. $K_e = \dfrac{\text{Dividend per Share}}{\text{Market Price per Share}} = \dfrac{\text{Rs. } 27}{\text{MPS}} = 20\%$. On substitution, MPS=Rs. 27÷20%= Rs. 135

3. $K_e = \dfrac{\text{Dividend per Share}}{\text{Market Price per Share}} = \dfrac{\text{DPS}}{\text{Rs. } 160} = 18\%$. On substitution, DPS=Rs. 160×18% = Rs. 28.80.

Illustration 7 : Cost of Equity — E/P Approach

Easy–Earnes Ltd has a uniform income that accrues in a four-year business cycle. It has an average EPS of Rs. 25 (per share of Rs. 100) over its business cycle. You are required to find out–

1. Cos of Equity Capital if Market Price in Year 1 is Rs. 150.

2. Expected Market Price in Year 2 if cost of Equity is expected to rise to 18%

3. EPS in Year 2 if the Company were to have an expected Market Price of Rs. 160 per share, at the existing cost Equity.

Solution :

1. $K_e = \dfrac{\text{Earning per Share}}{\text{Market Price per Share}} = \dfrac{\text{Rs. 25}}{\text{Rs. 150}} = 16.67\%$

2. $K_e = \dfrac{\text{Earning per Share}}{\text{Market Price per Share}} = \dfrac{\text{Rs. 25}}{\text{MPS}} = 18\%$. On substitution, MPS = Rs.25÷18%

$$= \text{Rs. } 138.89$$

Note : Earnings accrue evenly and hence EPS is uniform at Rs. 25 per share.

3. $K_e = \dfrac{\text{Earning per Share}}{\text{Market Price per Share}} = \dfrac{\text{EPS}}{\text{Rs. 160}} = 16.67\%$. On substitution, EPS=Rs.160×16.67%

$$= \text{Rs. } 26.67$$

Illustration 8 : Computation of EPS, Cost of Equity and Cost of Debt

The following is an extract from the Financial Statements of KPN Ltd. (in Rs. Lakhs)

Operating Profit	105
Less : Interest on Debentures	33
Net Operating Income before Tax	72
Less : Income tax	36
Net Profit after Tax	36
Equity Share Capital (Shares of Rs. 10 each)	200
Reserves and Surplus	100
15% Non-Convertible Debentures (of Rs. 100 each)	220
Total	520

Market Price per Equity Share is Rs. 12 and per Debenture is Rs. 93.75

What is the Earning per Share?

What is the percentage cost of capital to the Company for the Debenture Funds and the Equity?

Solution :

$$\text{EPS} = \frac{\text{Earning After Tax}}{\text{No. of Equity Shares}} = \frac{\text{Rs. 36 Lakhs}}{\text{20 Lakhs Shares}} = \text{Rs. 1.80}.$$

$$K_e = \frac{\text{Earning per Share}}{\text{Market per Share}} = \frac{\text{Rs. 1.80}}{\text{Rs. 12.00}} = \text{Rs. 15\%}.$$

Cost of Debt K_d may be computed as under—

Particulars	Book Value	Market Value
Cost — Interest	Rs. 33.00 Lakhs	Rs. 33.00 Lakhs
Interest after tax of 50%	Rs. 16.50 Lakhs	Rs. 16.50 Lakhs
Value of Debentures	Rs. 220.00 Lakhs	(220/100×93.75) = Rs. 206.25 Lakhs
K_d=After Tax Interest ÷ Value of Deb.	**7.5%**	**8%**

Illustration 9 : Cost of Equity — Growth Approach

Optimistic Ltd has an EPS of Rs. 90 per Share. Its Dividend Payout Ratio is 40%. Its Earnings and Dividends are expected to grow at 5% per annum. Find out the cost of Equity Capital if its Market Price is Rs. 360 per share.

Futuristic Ltd pays a Dividend of Rs. 2 per share. Its shares are quoted at Rs. 40 presently and investors expect a growth rate of 10% per annum. Calculate—

 (i) Cost of Equity Capital

 (ii) Expected Market Price per share if anticipated growth rate is 11%.

(iii) Market price if dividend is Rs. 2, cost of capital is 16% and growth rate is 10%.

Solution :

Optimistic Ltd.

i) $\quad K_e = \dfrac{\text{Dividend per Share}}{\text{Market Price per Share}} + g\,(\text{Growth Rate}) = \dfrac{\text{Rs. }90 \times 40\%}{\text{Rs. }360} + 5\% = .1 + .05 = 15\%$

Futuristic Ltd.

$\quad K_e = \dfrac{\text{Dividend per Share}}{\text{Market Priece per Share}} + g\,(\text{Growth}) = \dfrac{\text{Rs. }2}{\text{Rs. }40} + 10\% = 5\% + 10\% = 15\%.$

ii) $\quad K_e = \dfrac{\text{Dividend per Share}}{\text{Market Priece per Share}} + g.$ It is given that $K_e = 15\% = \dfrac{\text{Rs. }2}{\text{MPS}} + 11\%$

On transposing, we have, $\dfrac{\text{Rs. }2}{\text{MPS}} = 15\% - 11\% = 4\%$. So, MPS = Rs. 2 ÷ 4% = Rs. 50 per Share.

iii) $\quad K_e = \dfrac{\text{Dividend per Share}}{\text{Market Price per Share}} + g.$ It is given that $K_e = 16\% = \dfrac{\text{Rs. }2}{\text{MPS}} + 10\%$

On transposing, we have, $\dfrac{\text{Rs. }2}{\text{MPS}} = 16\% - 10\% = 6\%$. So, MPS = Rs. 2 ÷ 6% = Rs. 33 per Share.

Illustration 10 : Valuation of Equity Share — Present Value of Future Dividend Flows

D Ltd. is foreseeing a growth rate of 12% per annum in the next two years. The growth rate is likely to be 10% for the third and fourth year. After that, the growth rate is expected to

stabilise at 8% per annum. If the last dividend was Rs. 1.50 per Share and the Investor's required rate of return is 16%, determine the current value of Equity Share of the Comapny. The P.V. factors at 16% are —

Year	1	2	3	4
P V factor	0.862	0.743	0.641	0.552

Solution :

Value of Equity Share = Present Value of all dividend flows.

Year	Dividend	Discount Rate	PV of Dividend
1	Rs. 1.50 + 12% = Rs. 1.68	0.862	Rs. 1.4482
2	Rs. 1.68 + 12% = Rs. 1.88	0.743	Rs. 1.3968
3	Rs. 1.88 + 10% = Rs. 2.07	0.641	Rs. 1.3269
4	Rs. 2.07 + 10% = Rs. 2.27	0.552	Rs. 1.2530
5 onwards	See Note below = Rs. 30.65	0.552	Rs. 16.9160
Total	**Current Value of Equity Share of the Comapany**		**Rs. 22.3409**

Note : Computation of Perpetual Dividend received after 4th year i.e. at 8% per annum

$$\text{Total Dividend} = \frac{D \times (1+g)}{(k-g)} = \frac{2.27 \times (1+0.08)}{(0.16-0.08)} = \text{Rs. } 30.645$$

Where **D** = Dividend; **g** = Growth Rate and **K** = Cost of Equity Capial

Illustration 11 : Computation of WACC

(a) The Capital Structure of All-Good Ltd is — Equity Capital Rs. 5 Lakhs; Reserves and Surplus Rs. 2 Lakhs and Debentures Rs. 3 Lakhs. The Cost of Capital before Tax are – (a) Equity – 18% and (b) Debentures – 10%. You are required to compute the Weighted Cost of Capital, assuming a tax rate of 35%.

(b) From the following information, compute WACC of Super-Good Ltd. (Assume Tax = 35%)

- Debt to Total Funds : 2:5
- Preference Capital to Equity Capital : 1:1
- Preference Dividend Rate : 15%
- Interest on Debentures : Rs. 20000 for half-year.
- EBIT at 30% of Capital Employed : Rs. 3 Lakhs
- Cost of Equity Capital is 24%.

(c) Backwork Ltd has a Debt Equity Ratio of 2:1 and a WACC of 12%. Its Debentures bear interest of 15%. Find out the cost of Equity Capital. (Assume Tax = 35%)

Solution: (a) WACC of All Good Ltd

Component	Amount	%	Individual Cost in %	WACC
Debentures	3,00,000	30%	K_d= Interest ×(100%- Tax Rate) =10% × (100% - 35%) = 6.5%	1.95%
Equity	5,00,000	50%	K_e = 18%	9.00%
Reserves	2,00,000	20%	K_r= K_e= 18%	3.60%
Total	10,00,000		K_o =	**14.55%**

Note : Reserve are taken at same rate as Equity.

(b) Super Good Ltd.

EBIT at 30% of Capital Employed = Rs. 3 Lakhs, Capital Employed = Rs. 3 Lakhs/ 30% = Rs10,00,000.

Debt to Total Funds = 2:5. Hence, Debt = 2/5th of Rs. 10,00,000 = Rs. 4,00,000

Shareholders' Funds = balance 3/5th of Rs. 10,00,000 = Rs. 6,00,000

Preference to Equity Capital = 1:1 (i.e. equal). The total of both = Rs. 6,00,000

So, Preference Capital = Equity Capital = 1/2 of Rs. 6,00,000 = Rs. 3,00,000 each.

Interest on Debt = Rs. 20,000 × 2 = Rs. 40,000. Hence Interest Rate

= Rs. 40,000 / Rs. 4,00,000 = 10%.

WACC is computed as under—

Component	Amount	%	Individual Cost in %	WACC%
Debt	4,00,000	40%	K_d = Interest × (100% - Tax Rate) =10%×(100% - 35%) = 6.5%	2.60%
Preference	3,00,000	30%	K_p = 15%	4.50%
Equity	3,00,000	30%	K_e = 24%	7.20%
Total	10,00,000		K_o =	**14.30%**

(c) Computation of Cost of Equity of Backwork Ltd.

Component	%	Individual Cost in %	WACC%
Debt	2/3rd	K_d = Interest × (100% - Tax Rate) =15%× (100% -35%) = 9.75%	9.75%×2/3rd=6.50%
Equity	1/3rd	K_e = 5.50 ÷ 1/3rd = **16.50%** (final balancing figure)	12%-6.5%=**5.50%** (bal. figure)
Total		K_o =	**(given) 12.00%**

Illustration 12 : WACC - Book Value & Market Value Proportions-with/without tax.

The following information has been extracted from the Balance Sheet of ABC Ltd.as on 31st March -

Component of capital	Equity Share Capital	12% Debentures	18%Term Loan	Total
Amount Rs. In Lakhs	400	400	1,200	2,000

1. Determine the WACC of the Company. It had been paying dividends at a consistent rate of 20% per annum.

2. What difference will it make if the current price of the Rs.100 share is Rs.160?

3. Determine the effect of Income Tax on WACC under both the above situations. (Tax Rate = 40%).

Solution:

1. Computation of WACC (based on Book Value Proportions and ignoring Tax)

Component(a)	Proportion(b)	Indivitual Cost (c)	WACC (d) = (b)×(c)
Equity Share Capital	4/20	K_e=20% (Dividend Approach)	4.00%
12% Debentures	4/20	K_d= 12%	2.40%
18% Term Loan	12/20	K_d= 18%	10.80%
		WACC = K_o =	17.20%

Note : 1. K_e = Dividend per Share **Equals** Market Price per share = **Rs.20.**

2. Book Value Proportions have been considered in Column (b) above.

2. (a) Computation of WACC (based on Book Value Proportions and ignoring tax)

Component (a)	Proportion (b)	Individual Cost (c)	WACC (d) = (b)×(c)
Equity Share Capital	4/20	K_e = 20÷160 = 12.50%	2.50%
12% Debentures	4/20	K_d = 12%	2.40%
18% Term Loan	12/20	K_d = 18%	10.80%
Total Rs. 2,240 Lakhs		**WACC = K_0 =**	**15.70%**

2. (b) Computation of WACC (based on Market Value Proportions and ignoring tax)

Component (a)	Proportion (b)	Individual Cost (c)	WACC (d) = (b)×(c)
Equity Capital Rs. 640 Lakhs	64/224	K_e = 20÷160 = 12.50%	3.57%
12% Debentures Rs. 400 Lakhs	40/224	K_d = 12%	2.14%
18% Term Loan Rs. 1,200 Lakhs	120/224	K_d = 18%	9.64%
Total Rs. 2,240 Lakhs		**WACC = K_0 =**	**15.35%**

3. Effect of Tax Rate of 40% on WACC

(a) Computation of WACC with tax (Situation 1 above based on Book Value Proportions)

Component (a)	Proportion (b)	Individual Cost (c)	WACC (d) = (b)×(c)
Equity Share Capital	4/20	K_e = 20%	4.00%
12% Debentures	4/20	K_d = 12%×60% = 7.20%	1.44%
18% Term Loan	12/20	K_d = 18%×60% = 10.80%	6.48%
		WACC = K_0 =	**11.92%**

The WACC has reduced from **17.20%** to **11.92%,** due to tax saving effect.

(b) Computation of WACC with tax (Situation 2 (a) above based on Book Value Proportions)

Component (a)	Proportion (b)	Individual Cost (c)	WACC (d) = (b)×(c)
Equity Share Capital	4/20	K_e = 20 ÷160 = 12.50%	2.50%
12% Debentures	4/20	K_d = 12%×60% = 7.20%	1.44%
18% Term Loan	12/20	K_d = 18%×60% = 10.80%	6.48%
		WACC = K_0 =	**10.42%**

The WACC has reduced from **15.70%** to **10.42%** due to tax saving effect.

(c) Computation of WACC with tax (Situation 2(b) above based on Market Value Proportions)

Component (a)	Proportion (b)	Individual Cost (c)	WACC (d) = (b)×(c)
Equity Capital Rs. 640 Lakhs	64/224	K_e = 20÷160 = 12.50%	3.57%
12% Debentures Rs. 400 Lakhs	40/224	K_d = 12%×60% = 7.20%	1.29%
18% Term Loan Rs. 1,200 Lakhs	120/224	K_d = 18%×60% = 10.80%	5.78%
Total Rs. 2,240 Lakhs		**WACC = K_0 =**	**10.64%**

The WACC has reduced from **15.35%** to **10.64%,** due to tax saving effect.

Illustration 13 : WACC – Financing Decision of Projects

Z Co. has a capital structure of 30% debt and 70% equity. The company is considering various investment proposals costing less than Rs. 30 Lakhs. The company does not want to distrub its present capital structure. The cost raising the debt and equity are as follows :

Project Cost	Cost of Debt	Cost of Equity
Above Rs. 5 Lakhs	9%	13%
Above Rs. 5 Lakhs and upto Rs. 20 Lakhs	10%	14%
Above Rs. 20 Lakhs and upto Rs. 40 Lakhs	11%	15%
Above Rs. 40 Lakhs and upto Rs. 1 Crore	12%	15.55%

Assuming the tax rate is 50%, compute the cost of two projects A and B, whose fund requirements are Rs. 8 Lakhs and Rs. 22 Lakhs respectively. If the project are expected to yield after tax return of 11%, determine under what conditions if would be acceptable.

Solution :

Particulars	K_d (Debt)%	K_e (Equity) %	WACC = K_0
% of Debt and Equity	30%	70%	
Upto 5 Lakhs	9×50% = 4.5%	13%	4.5×30%+13×70% = 10.45%
Above 5 Lakhs upto 20 Lakhs	10×50% = 5.0%	14%	5.0×30%+14×70% = 11.30%
Above 20 Lakhs upto 40 Lakhs	11×50% = 5.5%	15%	5.5×30%+15×70% = 12.15%
Above 40 Lakhs upto 1 Crore	12×50% = 6.0%	15.55%	6.0×30%+15.55×70% = 12.69%

Project	Investment	WACC	Return	Decision
A	Rs. 8.00 Lakhs	11.3% (5L to 20L)	11%	ROI < WACC
B	Rs. 22.00 Lakhs	12.15% (20L to 40L)	11%	ROI < WACC

Decision : If ROI 11%, Project is acceptable only if

(a) Project Investment is less than Rs. 5 Lakhs.

(b) Fractional Investment is possible on a divisible project – Investment is less than Rs. 5 Lakhs.

Illustration 14 : Financing Decision and EPS Maximisation

A Company requires Rs. 15 Lakhs for the installation of a new unit, which would yield an annual EBIT of Rs. 2,50,000. The Company's objective is to maximise EPS. It is considering the possibility of Issuing Equity Shares plus raising a debt of Rs. 3,00,000, Rs. 6,00,000 and Rs. 9,00,000. The current Market Price per Share is Rs. 50 which is expected to drop to Rs. 40 per share if the market borrowings were to exceed Rs. 7,00,000., The cost of borrowing are indicated as follows :

Level of Borrowing Upto Rs. 2,00,000,Rs. 2,00,000 to Rs. 6,00,000   ,Rs. 6,00,000 to Rs. 9,00,000,

Cost of Borrowing 12% p.a., 15% p.a., 17% p.a.

Assuming a tax rate of 50%, work out the EPS and the scheme, which you would recommended to the Company.

Solution :   Statement showing EPS under the different schemes

Particulars	Scheme I	Scheme II	Scheme III
Capital Required	15,00,000	15,00,000	15,00,000
Less : Debt Content	3,00,000	6,00,000	9,00,000
Balance Equity Capital required	**12,00,000**	**9,00,000**	**6,00,000**
Market Price per Share	Rs. 50	Rs. 50	Rs. 40
Number of Equity Shares to be issued (Equity Capital/MPS)	24,000	18,000	15,000

Profitability Statement

			Scheme I	Scheme II	Scheme III
	EBIT		2,50,000	2,50,000	2,50,000
Less : Interest on Debt	First Rs. 2,00,000 at 12%		24,000	24,000	24,000
	Next Rs. 4,00,000 at 15%		15,000	60,000	60,000
	Balance at 17%		—	—	51,000
	Total Interest		39,000	84,000	1,35,000
	EBIT		2,11,000	1,66,000	1,15,000
Less : Tax at 50%			1,05,500	83,000	57,500
	EAT		1,05,500	83,000	57,500
	Earnings Per Share (EPS)=EAT ÷ No. of Shares		**4.40**	**4.61**	**3.83**
	Average Interest Rate = Total Interest ÷ Debt		**13%**	**14%**	**15%**
	ROCE=EBIT ÷ Capital Employed		**16.67%**	**16.67%**	**16.67%**

Conclusion : EPS is maximum under Scheme II and is hence preferable.

Leverage Effect : Use of Debt Funds and Financial Leverage will have a favourable effect only if ROCE > Interest rate. ROCE is 16.67% and hence upto 15% interest rate, i.e. Scheme II, use of debt will have favourable impact on EPS and ROCE. However, when interest rate is higher at 17%, financial leverage will have negative impact and hence EPS falls from Rs. 4.61 to Rs. 3.83.

Illustration 15 : Funding Pattern — EPS Maximisation

The following figures are made available to you —

Particulars	Rs.
Net Profits for the year	18,00,000
Less : Interest on Secured Debentures at 15% p.a.	
(Debentures were issued 3 months after commencement	
of the year)	1,12,500
PBT	16,87,500
Less : Tax at 35% and Dividend Distribution Tax	8,43,750
PAT	8,43,750
Number of Equity Shares of Rs. 10 each	1,00,000
Market Quotation of Equity Shares	Rs. 109.70 per share

The Company has accumulated revenue reserves of Rs. 12 Lakhs. It is examining a project requiring Rs. 10 Lakhs Investment, which will earn at the same rate as the funds already employed.

You are informed that a Debt-Equity Ratio (Debt÷[Debt+Equity]) above 60% will cause the PE ratio to come down by 25%. The interest rate on additional borrowals (above the present Secured Debentures) will cost the Company 300 basic points more than their current borrowal

on Secured Debentures. You are required to compute the probable price of the Equity Shares if the additional investment were to be raised by way of — (a) Loans or (b) Equity.

Solution : **1. Computation of Capital Employed and Debt–Equity Ratio**

Particulars	Present	Loan Option	Equity Option
Debt	1,12,500×12/9 ÷ 15% = Rs. 10,00,000	Rs. 10,00,000 + Rs. 10,00,000 = Rs. 20,00,000	(as per present situation) Rs. 10,00,000
Equity Capital	1,00,000 Shares×Rs 10 = Rs. 10,00,000	(as present) Rs. 10,00,000	**(See Note)** 10,91,160
Reserves	(given) Rs. 12,00,000	(given) Rs. 12,00,000	Rs. 12,00,000+Rs. 9,08,840 = Rs. 21,08,840
Total Funds Employed	**Rs. 32,00,000**	**Rs. 42,00,000**	**Rs. 42,00,000**
Debt Equity Ratio	10÷32 = **31.25%**	20÷42 = **47.62%**	10÷42 = **23.81%**

Present Market Value per Share = Rs. 109.70. Hence, additional funds of Rs. 10,00,000 will be raised by issue of shares at an issue price of Rs. 109.70 per Share.

Number of Equity Sharess to be issued = Rs. 10,00,000 ÷Rs. 109.70 per Share = 9,116 Shares of Rs. 10 each, issued at a premium of (Rs. 109.70–Rs. 10.00) Rs. 99.70 per Share.

Hence Additional Equity Share Capital = Rs. 91,160 and Additional Reserves i.e. Securities Premium = Rs. 9,08,840 (9,116 Shares × Rs. 99.70 approx.)

2. Computation of Profits and MPS

Present EBIT = Rs. 18,00,000 for Capital Employed of Rs. 32,00,000.

So, Return on Capital Empoyled = Rs. 18,00,000 ÷ Rs. 32,00,000 = 56.25%.

Revised EBIT after introducing additional funds = Rs. 42,00,000×56.25% = **Rs. 23,62,500.**

Particulars	Present	Loan Option	Equity Option
EBIT at 56.25%	18,00,000	23,62,500	23,62,500
Less : Interest next year - Deb.	1,12,500	1,50,000	1,50,000
Loans — 10,00,000 × 18%	—	1,80,000	—
EBIT	16,87,500	20,32,500	22,12,500
Less : Tax at 35%	5,90,625	7,11,375	7,74,375
EAT	**10,96,875**	**13,21,125**	**14,38,125**
Number of Equity Shares	(given) = 1,00,000	1,00,000	1,09,116
EPS	**10.97**	**13.21**	**13.18**
PE Ratio = MPS ÷ EPS	109.70 ÷ 10.97 = 10	10	10
Hence, Market Price	**Rs. 109.70**	**Rs. 132.10**	**Rs. 131.80**

Note :

For interest calculation purposes, 100 basic point = 1% interest. Hence, 300 basic points means 3%. So, Interest Rate on additional borrowings is 15% +3% = 18%.

Corporate Income Tax at 35% only is relevant. Dividend Distribution Tax is irrelevant for computing EPS, since dividend distribution is only an appropriation of profits.

Since Debt-Equity Ratio has not increased beyond 60%, PE Ratio will not be affected and will remain the same at 10, in all situations.

Illustration 16 : Funding Pattern — EPS Maximisation

Company earns a profit of Rs. 3,00,000 per annum after meeting its interest liability of Rs. 1,20,000 on its 12% debentures. The tax rate is 50%. The number of Equity Shares of Rs. 10 each are 80,000 and the retained earnings amount to Rs. 12,00,000.

The Company proposes to take up an expansion scheme for which a sum of Rs. 4,00,000 is required. It is anticipated that after expansion, the Company will be able to achieve the same return on investment as at present. The funds required for expansion can be raised either through debt at the rate of 12% or through the issue of Equity shares at par.

Required : 1. Compute the EPS if additional funds were raised by way of — (a) Debt;

(b) Equity Shares.

2. Advise the Company as to which source of finance is preferable.

Solution :   **1. Computation of Capital Employed**

Particulars	Present	Loan Option	Equity Option
Debt	1,20,000/12% = Rs. 10,00,000	Rs. 10,00,000 + Rs. 4,00,000 = Rs. 14,00,000	(as per present situation) Rs. 10,00,000
Equity Capital	80,000 shares × Rs. 10 = Rs. 8,00,000	(as present) Rs. 8,00,000	Rs. 8,00,000 + Rs. 4,00,000 = Rs. 12,00,000
Retained Earning	(given) Rs. 12,00,000	(given) Rs. 12,00,000	(given) Rs. 12,00,000
Total Fund Employed	**Rs. 30,00,000**	**Rs. 34,00,000**	**Rs. 34,00,000**

2. Computation of EPS

Present EBIT = Rs. (3,00,000 + 1,20,000) = Rs. 4,20,000 for Capital Employed of Rs. 30,00,000.
So, Return on Capital Employed = Rs. 4,20,00 / Rs. 30,00,000 = 14%.
Revised EBIT after introducing additional funds = Rs. 34,00,000 × 14% = Rs. 4,76,000.

Particulars	Present	Loan Option	Equity Option
EBIT at 14%	4,20,000	4,76,000	4,76,000
Less : Interest on Loans	1,20,000	1,68,000	1,20,000
EBIT	3,00,000	3,08,000	3,56,000
Less : Tax at 50%	1,50,000	1,54,000	1,78,000
EAT	**1,50,000**	**1,54,000**	**1,78,000**
Number of Equity Shares	(given) = 80,000	80,000	1,20,000
EPS = EAT÷No. of ES	**1.875**	**1.925**	**1.483**

Conclusion : EPS is maximum under Debt Funding Option and is hence preferable.

Leverage Effect : Use of Debt Funds and Financial Leverage willhave a favourable effect only if ROCE > Interest rate. ROCE is 14% and Interest Rate is 12%. So, use of debt will have favourable impact on EPS and ROE. This is called at "**Trading on Equity**" or "**Gearing**" Effect.

Illustration 17 : WACC and Marginal WACC Computation

XYZ Ltd. (in 40% Tax bracket) has the following book value capital structure —

Equity Capital (in shares of Rs. 10 each, fully paid-up at par)	Rs. 15 Crores
11% Prefernece Capital (in shares of Rs. 100 each, fully paid-up at par)	Rs. 1 Crore
Retained Earnings	Rs. 20 Crores
13.5% Debentures (of Rs. 100 each)	Rs. 10 Crores
15% Term Loans	Rs. 12.5 Crores

- The next expected dividend on Equity Shares is Rs. 3.60 per share. Dividends are expected to grow at 7% and the Market price per share is Rs. 40.
- Preference Stock, redeemable after ten years, is currently selling at Rs. 75 per share.
- Debentures, redeemable after 6 years, are selling at Rs. 80 per debenture.

Required :

1. Compute the present WACC using (a) Book Value Proportions and (b) Market Value Proportions.

2. Compute the weighted Marginal Cost of Capital if the Company raises Rs. 10 Crores next year, given the following information—
    - The amount will be raised by equity and debt in equal proportions.
    - The Company expects to retain Rs. 1.5 Crores earnings next year.
    - The additional issue of Equity Shares will result in the net price per share being fixed at Rs. 32.
    - The Debt capital raised by way of Term Loans will cost 15% for the first Rs. 2.5 Crores and 16% for the next Rs. 2.5 Crores.

Solution :

1. Computation of Cost of Equity under Dividend Approach

Present Cost of Equity under Dividend Approach :

$$K_e = \frac{\text{Dividend per Share}}{\text{Market Price per Share}} + g \text{ (Growth Rate)} = \frac{\text{Rs. }3.60}{\text{Rs. }40.00} + 7\% = 9\% + 7\% = \textbf{16.00\%.}$$

Revised Cost of Equity under Dividend Approach :

$$K_e = \frac{\text{Dividend per Share}}{\text{Market Price per Share}} + g \text{ (Growth Rate)} = \frac{\text{Rs. }3.60}{\text{Rs. }32.00} + 7\% = 11.25\% + 7\% = \textbf{18.25\%.}$$

2. Computation of Cost of Preference Share Capital

$$\frac{\text{Preference Dividend} + (\text{RV} - \text{Net Proceeds}) \div N}{(\text{RV} + \text{Net Proceeds}) \div 2} = \frac{[11 + (100 - 75) \div 10]}{[100 + 75] \div 2} = 15.43\%.$$

3. Computation of Cost of Debt

Present Cost of Debentures :

$$\frac{\text{Preference Dividend} + (\text{RV} - \text{Net Proceeds}) \div N}{(\text{RV} + \text{Net Proceeds}) \div 2} = \frac{[13.5 \times 60\% + (100 - 80) \div 6]}{[100 + 80] \div 2} = 12.70\%.$$

Present Cost of Term Loans = K_d = Interest $(100\% - \text{Tax Rate}) = 15\% \times (100\% - 40\%) = $ **9.00%.**

Cost of Additional Debt for first Rs. 2.50 Crores=Interest $(100\% - \text{Tax Rate}) = 15\% \times 60\% = $ **9.00%**

Cos fo Additional Debt for next Rs. 2.50 Crores=Interest $(100\% - \text{Tax Rate}) = 16\% \times 60\% = $ **9.60%.**

4. Computation of Present WACC base on Book Value Proportions

Particulars	Amount	Proportion	Individual Cost	WACC
Equity Capital	Rs. 15 Crores	15/58.5	16.00%	4.10%
Preference Capital	Rs. 1 Crore	1/58.5	15.43%	0.26%
Retaind Earnings	Rs. 20 Crores	20/58.5	16.00%	5.47%
Debentures	Rs. 10 Crores	10/58.5	12.70%	2.17%
Loans	Rs. 12.5 Crores	12.5/58.5	9.00%	1.92%
Total	**Rs. 58.5 Crores**	**100%**		K_0=**13.92%**

5. Computation of Present WACC base on Market Value Proportions

Particulars	Amount	Proportion	Individual Cost	WACC
Equity Capital	Rs. 60 Corres	60/81.25	16.00%	11.82%
Preference Capital	Rs. 0.75 Crore	0.75/81.25	15.43%	0.14%
Retained Earnings	Included in Market Value of Equity Share Capital, hence not applicable			
Debentures	Rs. 8 Crores	8/81.25	12.70%	1.25%
Loans	Rs. 12.5 Crores	12.5/81.25	9.00%	1.38%
Total	**Rs. 81.25 Crores**	**100%**		K_0 = **14.59%**

6. Computation of Marginal Cost of Capital

Marginal Cost of Capital is computed in different segments as under —

For the first Rs. 1.5 Crores of Equity and Debt each — since retained earnings are Rs. 1.5 Cores.

For the next Rs. 1 Crores of Debt and Equity each — since cost of debt changes beyond Rs. 2.5 Crores debt.

For the balance Rs. 2.5 Crores of Debt and Equity each.

Particulars	Debt	Equity	Total	Individual Cost	Marginal WACC
First Rs. 1.5 Crores	Rs. 1.5 Crores	Rs.1.5 Crores	Rs. 3 Crores	$K_d = 9.00\%$ $K_e = 16.00\%$	$(9.00\% \times 50\%) + (16.00\% \times 50\%)$ $= 12.50\%$
Next Rs. 1.5 Crores	Rs. 1 Crores	Rs.1 Crores	Rs. 2 Crores	$K_d = 9.60\%$ $K_e = 18.25\%$	$(9.60\% \times 50\%) + (18.25\% \times 50\%)$ $= 13.93\%$
Balance Amonnt	Rs. 2.5 Crores	Rs. 2.5 Crores	Rs. 5 Crores	$K_d = 9.60\%$ $K_e = 18.25\%$	$(9.60\% \times 50\%) + (18.25\% \times 50\%)$ $= 13.93\%$

Illustration 18 : Computation of Cost of Debt, Equity and WACC

The R & G Co. has following capital structure at 31st March 2009, which is considered to be optimum -

Particulars	Amount (in Rs.)
13% Debentures	3,60,000
11% Preference Share Capital	1,20,000
Equity Share Capital (2,00,000 Shares)	19,20,000

The Company's Share has a current Market Price of Rs.27.75 per Share. The expected Dividend per Share in the next year is 50 percent of the 2004 EPS. The EPS of last 10 years is as follows. The past trends are expected to continue -

Year	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004
EPS (Rs.)	1.00	1.120	1.254	1.405	1.574	1.762	1.974	2.211	2.476	2.773

The company can issue 14 percent New Debenture. The Company's Debenture is currently selling at Rs. 98. The New Preference Issue can be sold at a net price of Rs. 9.80, paying a dividend of Rs. 1.20 per share. The Company's marginal tax rate is 50%.

1. Calculate the After Tax Cost (a) of new Debt and new Preference Share Capital, (b) of ordinary Equity, assuming new Equity comes from Retained Earnings.

2. Calculate the Marginal Cost of Capital.

3. How much can be spent for Capital Investment before new ordinary share must be sold?Assuming that retained earning available for next year's Investment are 50% of 2004 earnings.

4. What will be Marginal Cost of Capital(cost of fund raised in excess of the amount calculated in part (3) if the Company can sell new ordinary shares to net Rs. 20 per share? The cost of Debt and of Preference Capital is constant.

Solution :

1. Computation of Cost of Additional Capital (component wise)

1. (a) After Tax Cost of New Debt =	$\dfrac{\text{Interest} \times \text{Tax Rate}}{\text{Net Proceeds of Issue}}$	$= \dfrac{14 \times 50\%}{105.54}$ **(Note 1)**	= 6.63%
1. (a) After Tax Cost of New = Preference Share Capital	$\dfrac{\text{Preference Dividend}}{\text{Net Proceeds of Issue}}$	$= \dfrac{\text{Rs. } 1.20}{\text{Rs. } 9.80}$	= 12.24%
1. (b) After Tax Cost of Ordinary Equity	(DPS ÷ MPS) + g	$= \dfrac{(2.773 \times 50\%)}{27.75} + 12\%$ **(Note 2)**	= 17.00%

Note 1 : Since Current 13% Debenture is selling at Rs. 98 (Rs. 100 presuned as Par Value), the Company can sell 14% New Debentures at (14% × 98) ÷ 13% = Rs. 105.54 approximately. Alternatively, K_d can also be computed as (Rs. 14 × 50%) ÷ Rs. 98 = **7.14%.**

Note 2 : For computing "**g**" i.e. Growth Rate under Realised Yield Method, the past avarage Growth Rate is at **12%**, in the following manner-

Year	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004
(Rs.) Additional	1.00 —	1.120 0.120	1.254 0.134	1.405 0.151	1.574 0.169	1.762 0.188	1.974 0.212	2.211 0.237	2.476 0.265	2.773 0.297
Increase	—	12.00%	11.96%	12.04%	12.03%	11.94%	12.03%	12.01%	11.99%	12.00%

Note: % Increase in EPS = Additional EPS ÷ Previous Year EPS e.g. 0.120 ÷ 1.00 etc.

2. Marginal Cost of Capital : Since the present Capital Structure is optium the additional funds will be raised in the same ratio in order to maintain the capital structure. Hence, Marginal Cost of Capital is **15.20%** , computed as under :

Component	Amount	Proportion as %	Individual Cost	WACC
Debt	3,60,000	15%	K_d = 6.63%	0.99%
Preference Capital	1,20,000	5%	K_p = 12.24%	0.61%
Equity Capital	19,20,000	80%	K_e = 17.00%	13.60%
Total	**24,00,000**	**100%**	**WACC = K_0 =**	**15.20%**

Note : When K_d is taken at 7.14%, K_o will be **15.28%** .

3. Retained Earnings available for further investments = 50% of 2004 EPS

$$= 50\% \times \text{Rs. } 2.773 \times 2,00,000 \text{ Shares}$$

$$= \textbf{Rs. 2,77,300}$$

Hence, amount to be spent before selling new ordinary shares = Rs. 2,77,300.

Since Equity is 80% of the total funds employed, the total capital before issuing fresh equity shares = Rs.2,77,300 ÷ 80% = **Rs.3,46,625.**

4. **Computation of Revised Marginal Cost of Capital** if Equity Issue is made at Rs. 20 per share

Revised Cost of Ordinary Equity if MPS (i.e. Issue Price) = Rs. 20	= (DPS ÷ MPS) +g	$= \dfrac{(2.773 \times 50\%) + 12\%}{20.00}$	= **18.93%**

Component	Amount	Proportion as %	Individual Cost	WACC
Debt	3,60,000	15%	K_d = 6.63%	0.99%
Preference Capital	1,20,000	5%	K_p = 12.24%	0.61%
Equity Capital	19,20,000	80%	K_e = 18.93%	15.15%
Total	**24,00,000**	**100%**	**WACC = K_0 =**	**16.75%**

Note : When K_d is taken at 7.14%, Revised K_o will be **16.82%**.

Illustration 19 : Computation of Marginal WACC - Redeemable PSC and Debt.

BC Limited has the following book value capital structure -

Equity Share Capital (150 million shares Rs.10 par)	Rs. 1,500 million
Reserves & Surplus	Rs. 2,250 million
10.5% Preference Share Capital (1 million shares Rs.100 par)	Rs. 100 million
9.5% Debentures (1.5 million debentures Rs.1000 par)	Rs. 1,500 million
15% Term Loans from Financial Institutions	Rs. 500 million

The debentures of ABC Limited are redeemable after three years and are quoting at Rs. 981.05 per debenture. The applicable income tax rate for the company is 35%.

The current Market Price per Equity Share is Rs. 60. The prevailing default risk free interest rate on 10 year GOI Treasury Bonds is 5.5%. The avarage market risk premium is 8%. The beta of the company is 1.1875.

The Preferred Stock of the Company is redeemable after 5 years and is currently selling at Rs.98.15 per Preference Share.

1. **Calculate the weighted cost of capital of the company using market value weights.**

2. **Define the marginal cost of capital schedule for the firm if it raises Rs. 750 million for a new project. The firm plans to have a target debt to value ratio of 20%. The beta of the new project is 1.4375. The debt capital will be raised through term loans. It will carry an interest rate of 9.5% for the first Rs. 100 million and 10% for the next Rs. 50 million.**

Solution :

1. **K_e (Cost of Equity Capital)**   = Risk Free Rate + Risk Premium

    = Risk Free Rate + (Average Market Risk Premium×Beta)

    = 5.5% + (8% × 1.1875) = 5.5%+ 9.5% = **15.00%**

2. K_p (Cost of Preference Share Capital) is computed using two alternative approaches as under -

(a) **Irredeemable Preference Capital :**

K_p = Preference Dividend ÷ Market value of Preference Share Capital = 10.5 ÷ 98.15 = **10.70%**.

(b) **Redeemable Preference Capital :**

$$98.5\% = \frac{10.5}{(1+YTM)^1} + \frac{10.5}{(1+YTM)^2} + \frac{10.5}{(1+YTM)^3} + \frac{10.5}{(1+YTM)^4} + \frac{10.5}{(1+YTM)^5}$$

Where YTM = Yield to Maturity. On solving, we get YTM = 11% (approximately).

So, K_p **= 11%.**

3. K_d (Cost of Debentures) is computed using two alternative approaches as under -

(a) **Irredeemable Debt (Check)**

$$K_d \text{ (for Debentures)} = \frac{[\text{Interest} \times (100\% - \text{Tax rate})]}{\text{Market Value of Debt}}$$

$$= \frac{1,500 \times 9.5\% \times (100\% - 35\%)}{1471.575} = 6.29\%$$

(b) **Redeemable Debt :**

$$981.05\% = \frac{95}{(1+YTM)^1} + \frac{95}{(1+YTM)^2} + \frac{95}{(1+YTM)^3}$$

Where YTM = Yield to Maturity.   On solving, we get YTM = 10% (approximately).

So, K_d = YTM × (100% - TAX Rate) = 10% × 65% = **6.5%.**

4. K_d (Cost of Term Loans) is computed as under —

$$K_d \text{ (for Term Loans)} = \frac{[\text{Interest} \times (100 - \text{Tax rate}]}{\text{Market Value Debt}}$$

$$= \frac{500 \times 8.5\% \times (100\% - 35\%)}{500} = \textbf{5.525}\%$$

5. (a) Computation of Individual Cost of Capital and WACC

Type of Capital	Market Value in Rs. millions		Ratio	Indl. Cost	WACC
Equity Share Capital	150×60 =	9000.000	81.30%	15.00%	12.20%
Reserver & Surplus	Included in Market Value of Equity Share Capital, hence not applicable				
10.5% Preference Share Capital	1×98.15 =	98.150	0.89%	10.70%	0.09%
9.5% Debentures	1.5×981.05 =	1471.575	13.30%	6.29%	0.84%
15% Term Loan	Given	500.000	4.51%	5.53%	0.25%
Total		**11069.725**	**100%**		**13.38%**

5. (b) Computation of Individual Cost of Capital and WACC (using YTM calculations)

Type of Capital	Market Value in Rs. millions		Ratio	Indl. Cost	WACC
Equity Share Capital	150×60 =	9000.000	81.30%	15.00%	12.20%
Reserver & Surplus	Included in Market Value of Equity Share Capital, hence not applicable				
10.5% Preference Share Capital	1×98.15 =	98.150	0.89%	11.00%	0.09%
9.5% Debentures	1.5×981.05 =	1471.575	13.30%	6.50%	0.86%
15% Term Loan	Given	500.000	4.51%	5.53%	0.25%
Total		**11069.725**	**100%**		**13.40%**

6. Marginal WACC : Total Amount to be raised = Rs. 750 million, of which debt should be 20% i.e. Rs. 150 millions and equity 80%, being Rs. 600 millions. Since cost of debt changes after Rs. 100 millions, the Marginal WACC is computed in the following segments -

Particulars	Debt	Equity	Individual Cost	Marginal WACC
First Rs. 500 millions	100 millions	400 millions	K_d = 9.5%×(100%–35%) = 6.175% K_e = 5.5%+(8%×1.4375) = 17%	K_0 = (6.175%×20%) + (17%×80%) = **14.835%**
Next Rs. 250 millions	50 millions	200 millions	K_d = 10%×(100%–35%) = 6.5% K_e = 5.5%+(8%×1.4375) = 17%	K_0 = (6.5%×20%) + (17%×80%) = **14.9%**

Illustration 20 : Computation of WACC

JKL Ltd has the following book - value capital structure as on 31ˢᵗ March -

Equity Share Capital (2,00,000 Shares)	Rs. 40,00,000
11.5% Preference Shares	Rs. 10,00,000
10% Debentures	Rs. 30,00,000
Total	**Rs. 80,00,000**

The Equity Shares of the Company sell for Rs.20. It is expected that the Company will pay a dividend of Rs.2 per share next year, this dividend is expected to grow at 5% p.a. forever. Assume 35% corporate tax rate.

1. Compute the Company's WACC based on the existing Capital Structure.
2. Compute the new WACC if the Company raises an additional Rs. 20 Lakhs debt by issuing 12% debentures. This would result in increasing the expected Equity dividend to Rs. 2.40 and leave the growth rate unchanged, but the price of equity share will fall to Rs. 16 per share.
3. Comment on the use of weights in the computation of WACC.

Solution :

1. $K_e = \dfrac{\text{Dividend per Share}}{\text{Market Price per Share}} + g = \dfrac{\text{Rs. 2.00}}{\text{Rs. 20.00}} + 5\% = 10\% + 5\% = 15\%.$

2. $K_d = \text{Interest (100\% – tax rate)} = 10\% \ (100\% – 35\%) = 6.50\%$

3. $K_p = \dfrac{\text{Preference Dividend}}{\text{Net Proceeds of Issue}} = \dfrac{\text{Rs. 1,15,000}}{\text{Rs. 10,00,000}} = \mathbf{11.50\%}$

4. Computation of WACC under present capital structure:

Particulars	Amount	%	Individual Cost	WACC
Debt	30,00,000	37.50%	$K_d = 6.50\%$	2.44%
Preference Capital	10,00,000	12.50%	$K_p = 11.50\%$	1.44%
Equity Capital	40,00,000	50.00%	$K_e = 15.00\%$	7.50%
Total	**80,00,000**	**100%**	**WACC = K_0 =**	**11.38%**

5. Computation of WACC under new capital structure :

Component	Amount	%	Individual Cost	WACC
Present Debt	30,00,000	30%	$K_d = 6.50\%$	1.95%
New Debt at 12%	20,00,000	20%	$K_d = 7.80\%$	1.56%
Preference Capital	10,00,000	10%	$K_p = 11.50\%$	1.15%
Equity Capital	40,00,000	40%	$K_e = 20.00\%$	8.00%
Total	**1,00,00,000**	**100%**	**WACC = K_0 =**	**12.66%**

$$\text{Revised } K_e = \frac{\text{Dividend per Share}}{\text{Market Price per Share}} + g = \frac{Rs.\ 2.40}{Rs.\ 16.00} + 5\% = 15\% + 5\% = \mathbf{20.00\%}.$$

6. Use of Weights: Market Value weights may be preferred to Book Value weights since they represent the Company's true corporate facet. In the evalution of a Company's performance, Cash Flows are preferred to more Book Profits; also Market Value Balance Sheet is analysed in depth rather than the Book Value Balance Sheet.

Illustration 21 : Computation of Cost of Equity using Beta

You are analysing the beta for ABC Computers Ltd. and have divided the Company into four broad business groups, with market values and betas for each group.

Business Group	Market value of Equity	Unleveraged beta
Main frames	Rs. 100 billion	1.10
Personal Computers	Rs. 100 billion	1.50
Software	Rs. 50 billion	2.00
Printers	Rs. 150 billion	1.00

ABC Computers Ltd. had Rs.50 billion in debt outstanding.

Required :

1. Estimate the beta for ABC Computers Ltd. as a Company. Is this beta going to be equal to the beta estimated by regressing past returns on ABC Computers stock against a market index. Why or Why not?

2. If the treasury bond rate is 7.5% estimate the cost of equity of ABC Computers Ltd. Estimate the cost of equity for each division. Which cost of equity would you use to value the printer division? The average market risk premium is 8.5%.

Solution :

1. Computation of Company Beta :

Group	Market value	Proportion	Unleveraged beta	Product beta
Mainframe	Rs. 100 billion	25%	1.10	0.275
Presonal Computer	Rs. 100 billion	25%	1.50	0.375
Software	Rs. 50 billion	12.5%	2.00	0.250
Printers	Rs. 150 billion	37.5%	1.00	0.375
Total	**Rs. 400 billion**	**100%**	**Unleveraged beta of portfolio**	**1.275**

Note : Beta measures the volatility of ABC Computers' stock returns against a broad-based market portfolio. In the above case, the beta is calculated for four business groups in a computer segment and not a broad-based market portfolio. Hence, beta calculations will not be the same, as such.

Beta of the Leveraged Firm B(L) = Beta of Unleveraged FirmB(U)×[(Equity+ Debt)÷Equity]

= 1.275 × [(400 + 50) ÷ 400]

= **1.434**

Market Index Relationship : This leveraged Beta of **1.434** will be equal to the Beta estimated by regressing returns on ABC Computers stock against a market index. The reasoning is as under-

1. The Beta of a security is a measure of return for the systematic risk of that security, relative to the market i.e. its Systematic Risk.

2. A portfolio generally consists of a well - diversified set of securities.

3. The Systematic Risk cannot be diversified away, and hence, the Beta of a portfolio is the **value - weighted beta** of the securities constituting the portfolio.

4. The Beta of a portfolio depicts the Systematic Risk (i.e. Non-Diversifiable Risk) of the portfolio itself.

3. Cost of **Equity for ABC Computers**   = Return of Risk Free Securities +

(Market Risk premium × Beta)

= 7.50% + (8.50% × 1.434) = **19.69%**

4. **Cost of Equity for each Division**

Division	Cost of Equity for each Division = Return of Risk Free Securities + (Market Risk premium × Beta)
Mainframe	= 7.50% + (8.50% × 1.10) = 16.85%
Personal Computer	= 7.50% + (8.50% × 1.50) = 20.25%
Software	= 7.50% + (8.50% × 2.00) = 24.50%
Printers	= 7.50% + (8.50% × 1.00) = 16.00%

For valuing Printer Division, K_e of 16% would be used.

Illustration 22 : Leverage and Beta Analysis

The following summarises the percentage changes in operating income, percentage changes in revenues and the betas of four pharmaceutical firms.

Firm	Change in Revenue	Change in Operating Income	Beta
PQR Ltd.	27%	25%	1.00
RST Ltd.	25%	32%	1.15
TUV Ltd.	23%	36%	1.30
WXY Ltd.	21%	40%	1.40

Required :

1. Calculate the Degree of Operating Leverage for each of these firms.
2. Use the Operating Leverage to explain why these firms have different beta.

Solution :

Firm	Change in Revenue	Change in Operating Income	Degree of Operating Leverage	Beta
(1)	(2)	(3)	(4) = (3) ÷ (2)	(5)(given)
PQR Ltd.	27%	25%	0.926	1.00
RST Ltd.	25%	32%	1.28	1.15
TUV Ltd.	23%	36%	1.57	1.30
WXY Ltd.	21%	40%	1.905	1.40

Inference :

1. DOL of WXY Ltd. is the highest of all firms. High DOL reflects high operating risk, which means WXY Ltd. has the maximum operating risk. Also PQR Ltd. is exposed to minimum operating risk, when compared to other firms.

2. Beta is the measure of volatility of risk of a security against the market risk. Both Operating Leverage and Beta reveals the measure of risk. Since the Operating Leverage is different for each firm, the beta would also be different. Therefore, High DOL = High Risk = High Beta.

Illustration 23 : Net Income Approach – Valuation of Firm

The following data relates to four Firms—

Firm	A	B	C	D
EBIT in Rs.	2,00,000	3,00,000	5,00,000	6,00,000
Interest in Rs.	20,000	60,000	2,00,000	2,40,000
Equity Capitalization Rate	12%	16%	15%	18%

Assuming that there are no taxes and rate of debt is 10%, determine the value of each firm using the Net Income approach. Also determine the Overall Cost of Capital of each firm.

Solution :

Firm	A	B	C	D
EBIT	2,00,000	3,00,000	5,00,000	6,00,000
Less : Interest	20,000	60,000	2,00,000	2,40,000
EBT = Net Income	**1,80,000**	**2,40,000**	**3,00,000**	**3,60,000**
K_e (given)	12%	16%	15%	18%
Value of Equity (E)=Net Income $\div K_e$	15,00,000	15,00,000	20,00,000	20,00,000
Value of Debt (D)=Interest $\div K_d$ of 10%	2,00,000	6,00,000	20,00,000	24,00,000
Value of Firm (V) = (E+D)	17,00,000	21,00,000	40,00,000	44,00,000
K_0 = WACC = EBIT$\div$V	**11.76%**	**14.29%**	**12.5%**	**13.64%**

Under NI Approach, increase in Debt content leads to increase in value of Firm & decrease in WACC.

Illustration 24 : NOI & M&M Approach

ABC Ltd adopts constant WACC approach and believes that its cost of debt and overall cost of capital is at 9% and 12% respectively. If the ratio of the market value of debt to the market value of equity is 0.8, what rate of return do Equity Shareholders earn? Assume that there are no taxes.

Solution :

Constant WACC implies the use of NOI or M&M Approach. Under M&M Approach, $K_e = K_0$ +Risk Premium.

$$\text{So, } K_e = K_0 + (K_0 - K_d) \frac{\textbf{Debt}}{\textbf{Equity}}$$

On substitution, we have, K_e = 12%+(12%-9%)×80% = **14.4%**

Alternatively, K_e can be obtained as balancing figure as under —

(*Note : Debt : Equity = 0.8 = **4 : 5***)

Component	%	Individual Cost in %	WACC %
Debt	4/9th	K_d = 9.00%	9.00% × 4/9th = 4.00%
Equity	5/9th	K_e = 8.00 ÷ 5/9th = **14.40%**	12% – 4% = **8.00%**
		(final balancing figure)	(balance figure)

Illustration 25 : Traditional Theory - Optimum Cost of Capital

TT Ltd has a PBIT of Rs.3 Lakhs. Presently the company is financed by equity capital of Rs. 20 Lakhs with Equity Capitalization Rate of 16%. It is contemplating to redeem a part of its Capital by introducing Debt Financing. It has two options—to raise debt to the tune of 30% or 50% of the total funds.

It is expected that for debt financing upto 30% will cost 10% and Equity Capitalization Rate will rise to 17%. However, if the Firm opts for 50% debt, it will cost 12% and Equity Shareholders expectation will be 20%.

From the above, compute the Overall Cost of Capital of the different options and comment thereon.

Solution :

	Plan	0% Debt	30% Debt	50% Debt
	Debt	Nil	Rs. 6,00,000	Rs. 10,00,000
	Equity Capital (bal. figure)	Rs. 20,00,000	Rs. 14,00,000	Rs. 10,00,000
	Total Assets	**Rs. 20,00,000**	**Rs. 20,00,000**	**Rs. 20,00,000**
	EBIT	Rs. 3,00,000	Rs. 3,00,000	Rs. 3,00,000
Less :	Interest	—	Rs. 60,000	Rs. 1,20,000
	PBT	**Rs. 3,00,000**	**Rs. 2,40,000**	**Rs. 1,80,000**
	K_e	16%	17%	20%
	Value of Equity (E) = PBT ÷ K_e	Rs. 18,75,000	Rs. 14,12,000	Rs. 9,00,000
Add :	Value of Debt (D)	—	Rs. 6,00,000	Rs. 10,00,000
	Value of Firm = V = (E+D)	Rs. 18,75,000	Rs. 20,12,000	Rs. 19,00,000
	WACC = K_e = EBIT ÷ V	**16.00%**	**14.91%**	**15.79%**

Inference : Traditional Theory lays down that as debt content increases, rate of interest on debt increases & Equity Shareholders expectations also rise. Hence Value of Firm & WACC will be affected. By suitably altering Debt content the firm should achieve maximum Firm Value & minimum WACC.

Illustration 26 : M&M Approach - Value of Levered & Unlevered Firm - Computing WACC

Companies Uma and Lata are identical in every respect except that the former does not use debt in its capital structure, while the latter employs Rs.6 Lakh of 15% Debt. Assuming that, (a) all the M&M assumptions are met, (b) the corporate tax rate is 35%, (c) the EBIT is Rs.2,00,000 and (d) the equity capitalization of the unlevered Company is 20%. What will be the value of the firms - Uma and Lata? Also, determine the weighted Average Cost of Capital for both the firms.

Solution :

$$\text{Value of Unlevered Firm} = \text{Value of Equity only} = \frac{[\text{PBIT}(100\% - \text{Tax Rate})]}{\text{Cost of Equity } K_e} = \frac{2,00,000 \times 65\%}{20\%}$$

$$= \textbf{Rs. 6,50,000}$$

Value of Levered Firm   = Value of Unlevered Firm + (Value of Debt × Tax Rate)

                         = Rs. 6,50,000 + (Rs. 6,00,000×35%) = **Rs. 8,60,000.**

	Particulars	(Unlevered) Uma	(Levered) Lata
	EBIT	2,00,000	2,00,000
Less :	Interest on Debt (Rs. 6,00,000×15%)	—	90,000
	PBT	2,00,000	1,10,000
Less :	Tax at 35%	70,000	38,500
	EAT	**1,30,000**	**71,500**
	Value of Firm (V) (as computed above)	6,50,000	8,60,000
Less :	Value of Debt (D)	Nil	6,00,000
	Value of Equity (E) = (V) – (D)	6,50,000	2,60,000
	Cost of Equity = EAT ÷ Value of Equity	20%	27.5%
	Cost of Debt	Nil	15%×65% = 9.75%
	WACC = $K_d \times \dfrac{D}{V} + K_e \times \dfrac{E}{V}$	**20%**	9.75%×(60/86)=6.80%
			+ 27.5%×(26/86)=8.31%
			WACC = 15.11%

Illustration 27 : Traditional and M&M Approach

A Company estimates its Cost of Debt and Cost of Equity for different debt - equity mix, as under.

% of Debt	0%	20%	40%	60%	80%	90%
Cost of Debt	—	10%	10%	12%	14%	16%
Cost of Equity	18%	19%	21%	25%	32%	40%

1. Compute the Overall Cost of Capital and Optimal Debt - Equity Mix under the Traditional Theory.

2. Consider the Cost of Debt at different debt - equity mix as given above. If M&M Approach were to hold good, what will be the cost of Equity Capital at different debt - equity mix? What will be the Risk Premium?

Solution : 1. Computation of K_o at different Debt - Equity Mix (Traditional Theory)

Situation	% of Debt and K_d		% of Equity and K_e		WACC i.e. K_0
I	0%	Nil	100%	18%	(0×Nil) + (100% × 18%) = 18.0%
II	20%	10%	80%	19%	(20%×10%) + (80% × 19%) = 17.2%
III	40%	10%	60%	21%	(40%×10%) + (60% × 21%) = **16.6%**
IV	60%	12%	40%	25%	(60×12%) + (40% × 25%) = **17.2%**
V	80%	14%	20%	32%	(80%×14%) + (20% × 32%) = 17.6%
VI	90%	16%	10%	40%	(90×16%) + (10% × 40%) = 18.4%

From the above, the optimal debt equity mix is 40% Debt and 60% Equity, relating to least WACC of **16.6%.**

2. Computation of Cost of Equity under M&M Approach

Under M&M approach, WACC = K_e at 0% Debt: Since WACC is constant, WACC at 0% Debt (i.e. 100% Equity) should be the same as WACC at any other percentage of debt. Hence WACC = K_e when the Firm is financed purely by Equity. So, WACC of a Firm equals the Capitalization Rate of pure equity stream of its class of risk. In the above case, WACC = K_e at 0% Debt = 18%.

$$\text{So, } K_e = K_0 + (K_0 - K_d) \frac{\text{Debt}}{\text{Equity}}$$

Situation	Debt : Equity	K_0 (Constant)	K_d	$K_e = K_o + (K_o - K_d) \times D/E$	Risk Premium = $K_e - K_0$
I	Nil	18%	Nil	18%+(18%–0%)×0 = 18.00%	Nil
II	20 : 80	18%	10%	18%+(18%–10%)×2/8 = 20.00%	2.00%
III	40 : 60	18%	10%	18%+(18%–10%)×4/6 = 23.33%	5.33%
IV	60 : 40	18%	12%	18%+(18%–12%)×6/4 = 27.00%	9.00%
V	80 : 20	18%	14%	18%+(18%–14%)×8/2 = 34.00%	16.00%
VI	90 : 10	18%	16%	18%+(18%–16%)×9/1 = 36.00%	18.00%

Illustration 28 : Rights Share Valuation

Pioneer Ltd. has issued 15,000 Equity Shares of Rs. 10 each. The current Market Price per Share is Rs. 37. The Company has a plan to make a rights issue of one new equity share at a price of Rs. 25 for every five shares held. You are required to -

1. Calculate the Theoretical Post-Rights Price per Share.

2. Calculate the Theoretical Value of the Rights alone.

3. Show the effect of the rights issue on the wealth of a shareholders who has 1,000 shares assuming he sells the entire rights;and

4. Show the effect if the same Shareholders does not take any action ignores the issue.

Solution :

1. Theoretical Post Rights Price per share

$$= \frac{(\text{Old Number of Shares} \times \text{Old Market Price}) + (\text{Right Shares} \times \text{New Price})}{\text{Total Number of Shares}}$$

$$=[(5 \times \text{Rs.}37) + (1 \times \text{Rs.}25)] \div (5+1) = \text{Rs.}210 \div 6 = \text{Rs.}35.$$

2. Theoretical Value of Rights=Post Rights Price per Share - Cost of Rights Share= 35-25=**Rs.10.**

3.**Value of Shares :**

Before Rights Issue		After Rights Issue	
1,000 Shares at Rs. 37	Rs. 37,000	1,000 Shares at Rs 35	Rs. 35,000
Sales of Rights	Nil	Sale of Rights 1,000/5×Rs. 10	Rs. 2,000
Total	**Rs. 37,000**	**Total**	**Rs. 37,000**

4. If the Shareholders ignores the issue, there is a loss due to dimunition in value to the extent of Rs.2,000.

Illustration 29 : EBIT-EPS Indifference Point

Calculate the level of EBIT at which the EPS indifference point between the following financing alternatives will occur-

1. Equity Share Capital of Rs. 6,00,000 and 12% Debentures of Rs. 4,00,000 [or]
2. Equity Share Capital of Rs. 4,00,000, 14% Preference Share Capital of Rs. 2,00,000 and 12% Debentures of Rs. 4,00,000.

Assume that Corporate Tax rate is 35% and par value of Equity Share is Rs. 10 in each case.

Solution : Let the PBIT at the indifference point level be Rs. X

	Particulars	Alternative 1	Alternative 2
	EBIT	X	X
Less :	Interest	48,000	48,000
	PBT	X–48,000	X–48,000
Less :	Tax at 35%	0.35X—16,800	0.35X—16,800
	EAT	0.65X—31,200	0.65X—31,200
Less :	Preference Dividend	Nil	28,000
	Residual Earnings available	0.65X—31,200	0.65X—59,200
	Number of Equity Shares	60,000	40,000
	Earnings per Share (EPS)	$\dfrac{0.65X-31,200}{60,000}$	$\dfrac{0.65X-59,200}{40,000}$

For indifference between the above alternatives, EPS should be equal.

Hence, we have $\dfrac{0.65X-31,200}{60,000} = \dfrac{0.65X-59,200}{40,000}$

On Cross Multiplication, 1.30X - 62,400 = 1.95X - 1,77,600.

0.65X = 1,15,200 or X = PBIT = Rs. 1,77,231.

Illustration 30 : Financial BEP, EBIT EPS Indifference Point and Interpretation

ABC Ltd. wants to raise Rs.5,00,000 as additional capital. It has two mutually exclusive alternative financial plans. The current EBIT is Rs.17,00,000 which is likely to remain unchanged. The relevant Information is -

Present Capital Structure:	3,00,000 Equity shares of Rs.10 each and 10% Bonds of Rs. 20,00,000
Tax Rate:	50%
Current EBIT:	Rs. 17,00,000
Current EPS:	Rs. 2.50
Current Market Price:	Rs. 25 per share
Financial Plan I:	20,000 Equity Shares at Rs. 25 per share.
Financial Plan II:	12% Debentures of Rs. 5,00,000.

What is the indifference level of EBIT? Identify the financial break-even levels and plot the EBIT-EPS lines on graph paper. Which alternative financial plan is better?

Solution :

1. Computation of EBIT - EPS Indifference Point

Particulars	Financial Plan I	Financial Plan II
Owner's Funds	(3,00,000×10+20,000×25)= Rs. 35,00,000	3,00,000×10=Rs.30,00,000
Borrowed Funds (given)	Rs. 20,00,000	20,00,000+5,00,000=Rs. 25,00,000
Total Capital Employed	**Rs. 55,00,000**	**Rs. 55,00,000**

Particulars	Financial Plan I	Financial Plan II
EBIT (let it be Rs. X)	X	X
Less: Interest	20,00,000×10%=Rs.2,00,000	(20,00,000×10%+5,00,000×12%)= Rs. 2,60,000
EBT	X−2,00,000	X−2,60,000
Less: Tax at 50%	½X−1,00,000	½X−1,30,000
EAT	½X−1,00,000	½X−1,30,000
Number of Equity Shares	3,00,000+20,000=3,20,000	(given) 3,00,000
EPS	[½X−1,00,000]÷3,20,000	[½X−1,30,000]÷3,00,000

For indifference between the above alternatives, EPS should be equal.

Hence, we have $\dfrac{[½X - 1,00,000]}{3,20,000} = \dfrac{[½X - 1,30,000]}{3,00,000}$

On Cross Multiplication, 15X - 30 Lakhs = 16X - 41.6 Lakhs; or X = 11.6 Lakhs

Hence EBIT should be **Rs. 11.60 Lakhs** and at that level, EPS will be **Rs. 1.50** under both alternatives.

2. Computation of Financial Break-Even Point

The Financial BEP for the two plans are --

Plan I EBIT = Rs. 2,00,000(i.e. 10% interest on Rs. 20,00,000)

Plan II EBIT = Rs. 2,60,000(i.e. 10% interest on Rs. 20,00,000 and 12% interest on Rs. 5,00,000)

3. Graphical Depiction of Indifference Point and Financial BEP
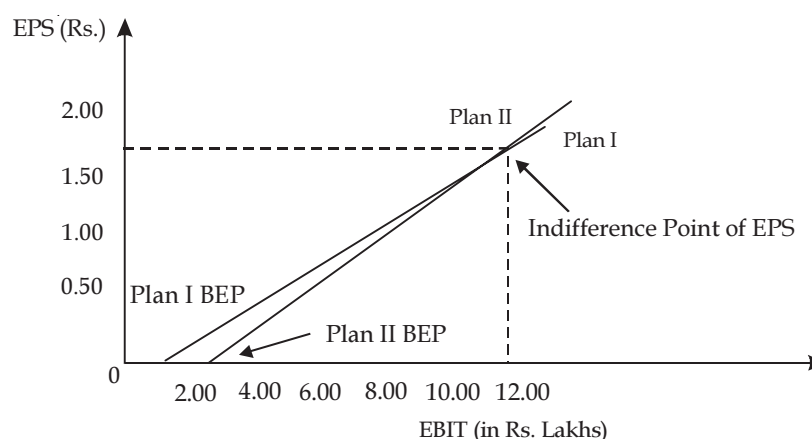
4. Interpretation of Graph :

   (a) The horizontal intercepts identify the Financial Break Even levels of EBIT for each plan.

   (b) The point at which EPS lines of both plans interest is called Indifference Point. Its horizontal intercept gives the level of EBIT at that point. The vertical intercept gives the value of EPS at that point.

   (c) Below the indifference point, one plan will have EPS over the other. Above that point, automatically the other plan will have higher EPS over the former. This is interpreted as under--

Interpretation of the Indifference Point

Situation	Option	Reason
EBIT below Indifference Point	Option with lower debt (Interest Burden)	When rate of earnings and operating profits (EBIT) are low, more interest and debt burden is not advisable. A high DOL should be properly managed by low Financial Leverage.
EBIT equal to Indifference Point	Any alternative can be chosen.	Same EPS due to indifference point.
EBIT above Indifference Point	Option with higher debt (Interest Burden)	When EBIT is high, financial leverage works till the EPS is maximised. Low DOL should be coupled with high DFL, to maximize gain of Equity Shareholders.

Conclusion : In the given case Indifference Point of EBIT = Rs. 11.60 Lakhs but the current EBIT is Rs. 17 lakhs. The new EBIT after employing additional capital of Rs. 5 Lakhs will be (17/50×55)=Rs. 18.70 Lakhs. Since this is above the indifference point of Rs. 11.60 Lakhs, the option with the higher debt burden should chosen. Hence, the firm should prefer Plan II for financing.

Note : As an exercise, students may recalculate the EPS for both plans with EBIT of Rs. 18.70 Lakhs, EPS will be Rs. 2.61 and Rs. 2.68 respectively. Hence Plan II is better on account of higher EPS.

Illustration 31 : EVA using Cost of Capital

Consider a firm that has existing assets in which it has capital invested of Rs.100 Crores. The after tax operating Income on assets-in-place is Rs. 15 Crore. The return on capital of 15% is expected to be sustained till perpetuity, and Company has a Cost of Capital of 10%. Estimate the present value of Economic Values Added (EVA) to the firm from its assets - in - Place.

Solution :

Operating Profit after Tax	= Rs. 15 Crores
Less: Capital Employed×WACC = 100×10%	= Rs. 10 Crores
Economic Value Added(EVA)	= Rs. 5 Crores

Since this EVA is sustained till perpetuity,

Present value of EVA = Assets-in-Place ÷ Cost of Capital =Rs.15   Crores÷10%=**Rs. 150 Crores**.

2.3. Capital Budgeting

This Section includes :

- Capital Budgeting Process
- Time Value of Money
    - Future Value
    - Present Value
- **Investment Appraisal Techniques**
    - Payback Period
    - Accounting Rate of Return
    - Earnings Per Share
    - Net Present Value
    - Internal Rate of Return
    - Net Terminal Value
    - Profitability Index
    - Discounted Payback Period
- Capital Rationing

INTRODUCTION :

Capital Budgeting is the art of finding assets that are worth more than they cost to achieve a predetermind goal *i.e.*, 'optimising the wealth of a business enterprise'.

Capital investment involves a cash outflow in the immediate future in anticipation of returns at a future date.

A capital investment decision involves a largely irreversible commitment of resources that is generally subject to significant degree of risk. Such decisions have for reading efforts on an enterprise's profitability and flexibility over the long-term. Acceptance of non-viable proposals acts as a drag on the resources of an enterprise and may eventually lead to bankrupcy.

For making a rational decision regarding the capital investment proposals, the decision maker needs some techniques to convert the cash outflows and cash inflows of a project into meaningful yardsticks which can measure the economic worthiness of projects.

CAPITAL BUDGETING PROCESS :

A Capital Budgeting decision involves the following process :

(1) Investment screening and selection

(2) The Capital Budget proposal

(3) Budgeting Approval and Authorization

(4) Project Tracking

(5) Post-completion Auditor

TIME VALUE OF MONEY :

Concept

We know that Rs. 100 in hand today is more valuable than Rs. 100 receivable after a year.

We will not part with Rs. 100 now if the same sum is repaid after a year. But we might part with Rs. 100 now if we are assured that Rs. 110 will be paid at the end of the first year. This "additional Compensation" required for parting Rs. 100 today, is called "interest" or "the time value of money". It is expressed in terms of percentage per annum.

Why should money have time value?

Money should have time value for the following reasons :

(a) Money can be employed productively to generate real returns;

(b) In an inflationary period, a rupee today has higher purchasing power than a rupee in the future;

(c) Due to uncertainties in the future, current consumption is preferred to future consumption.

(d) The three determinants combined together can be expressed to determine the rate of interest as follows :

Nominal or market interest rate

= Real rate of interest or return (+) Expected rate of inflation (+) Risk premiums to compensate for uncertainty.

Methods of Time Value of Money

(1) **Compounding :** We find the Future Values (FV) of all the cash flows at the end of the time period at a given rate of interest.

(2) **Discounting :** We determine the Time Value of Money at Time "O" by comparing the initial outflow with the sum of the Present Values (PV) of the future inflows at a given rate of interest.

Time Value of Money

Compounding	Discounting
(Future Value)	(Present Value)
(a) Single Flow	(a) Single Flow
(b) Multiple Flows	(b) Uneven Multiple Flows
(c) Annuity	(c) Annuity
	(d) Perpetuity
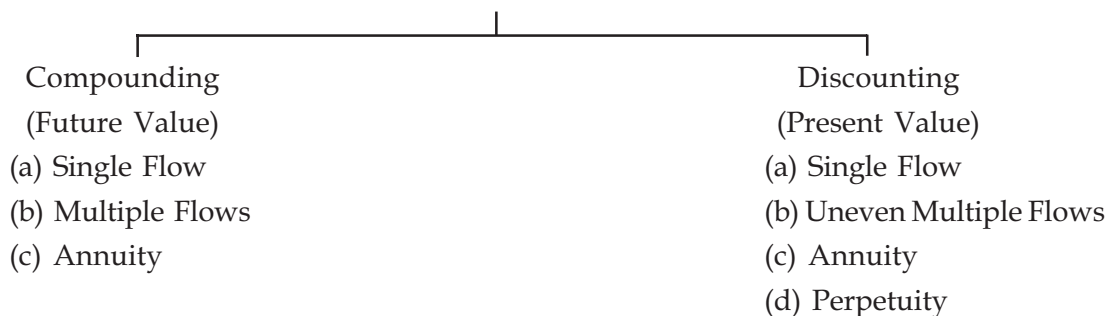
Future Value of a Single Flow

It is the process to determine the future value of a lump sum amount invested at one point of time.

$$FV_n = PV\ (1+i)^n$$

Where,

FV_n = Future value of initial cash outflow after n years

PV = Initial cash outflow

i = Rate of Interest p.a.

n = Life of the Investment

and $(1+i)^n$ = Future Value of Interest Factor (FVIF)

Illustration :

The fixed deposit scheme of Punjab National Bank offers the following interest rates :

Period of Deposit	Rate Per Annum
46 days to 179 days	5.0
180 days < 1 year	5.5
1 year and above	6.0

An amount of Rs. 15,000 invested today for 3 years will be compounded to :

$$
\begin{aligned}
FV_n &= PV\ (1+i)^n \\
&= PV \times FVIF\ (6,3) \\
&= PV \times (1.06)^3 \\
&= 15,000\ (1.191) \\
&= Rs.\ 17,865
\end{aligned}
$$

Doubling Period "How long will it take for the amount invested to be doubled for a given rate of interest"?

(i) By Applying "Rule of 72"

$$\text{Doubling Period} = \frac{72}{\text{Rate of Interest}}$$

For instance, if the rate is 5%, then the doubling period is $\dfrac{72}{5} = 14.4$ years.

(ii) **Rule of 69 :** For a better and accurate way of calculating the doubling period :

$$= 0.35 + \frac{69}{\text{Interest Rate}}$$

$$= 0.35 + \frac{69}{5} = 0.35 + 13.8 = 14.15 \text{ years.}$$

If compounding is done for shorter periods (i.e. other than annual compounding)

$$FV = PV_n \left(1 + \frac{i}{m}\right)^{m \times n}$$

PV = Initial Cash Outflow

i = Rate of interest p.a.

m = no. of times compounding is done per year

n = no. of years for which compounding is done.

Illustration : Calculate the Future value of Rs. 1000 invested in State Bank Cash Certificate Scheme for 2 years @ 5.5% p.a., compounded semi-annully.

Solution :

$$FV_n = PV\left(1 + \frac{i}{m}\right)^{m \times n} \qquad = 1000\,(1.0275)^4$$

$$= 1,000\left(1 + \frac{0.055}{2}\right)^{2 \times 2} \qquad = 1000 \times 1.11462 = Rs.\,1,114.62$$

Future Value of Multiple Flows

Rate of Interest = 6% p.a. Total Accumulation after 3 years

Being of Year	Investment (Rs.)	EVIF	Compounded Value (Rs.)
0	4,000	1.2625	5,050
1	6,000	1.191	7,146
2	5,000	1.1236	5,618
3	5,000	1.06	5,300
Total	20,000		23,114

The total compounded value is Rs. 23,114

Future Value of Annuity

Annuity is a term used to describe a series of periodic flows of equal amounts. These flows can be inflows or outflows.

The future value of annuity is expressed as :

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

where, 	A = Amount of Annuity

i = rate of interest

n = time period

FVA_n = compounded at the end of n years.

and $\left[\dfrac{(1+i)^n - 1}{i}\right]$ is the Future Value of Interest Factor for Annuity (FVIFA)

Illustration :

Calculation the maturity value of a recurring deposit of Rs. 500 p.a. for 12 months @ 9% p.a. compounded quarterly.

Solution :

Effective rate of interest per annum $= \left(1 + \dfrac{0.09}{4}\right)^4 - 1$

$$= 1.0931 - 1 = 0.0931$$

Rate of interest per month

$$= (1+i)^{\frac{1}{m}} - 1$$

$$= (1+0.0931)^{\frac{1}{12}} - 1$$

$$= 1.0074 - 1$$

$$= 0.0074$$

$$= 0.74\%$$

Maturity Value can be calculated as follows :

$$FVAn = A\left\{\dfrac{(1+i)^n - 1}{i}\right\}$$

$$= 500\left\{\dfrac{(1+0.0074)^{12} - 1}{0.0074}\right\}$$

$$= 500 \times 12.50 = Rs.\ 6250/-$$

Present Value of a Single Flow :

$$PV = \dfrac{FV_n}{FVIF(i,n)} = \dfrac{FV_n}{(1+i)^n}$$

Where,   PV = Present Value

FV_n = Future Value receivable after n years

i = rate of interest

n = time period

and $\dfrac{1}{FVIF(i,n)} = PVIF(i,n)$ [Present Value of Interest Factor]

Illustration :

Calculate the Present Value of Rs. 1000 receivable after 3 years. Cost of Capital @ 10% p.a.

Solution :

P.V. of Re. 1 @ 10% p.a. receivable after 3 years.

$$= 0.7513$$

∴ P.V. of Rs. 1000 = Rs. 1000 × 0.7513 = Rs. 751.30

Present Value of Uneven Multiple Flows

Year	Cash Inflows	P.V.F @ 10%	Discounted Cash Flows
1	50,000	0.9091	45,455
2	90,000	0.8264	74,376
3	1,20,000	0.7513	90,156
	2,60,000		2,09,987

∴ The present value of Rs. 2,60,000 discounted @ 10% will be Rs. 2,09,987.

Present Value of Even Cash Inflows

Calculate P.V. of Rs. 50,000 receivable for 3 years @ 10%

P.V. = Cash Flows × Annuity @ 10% for 3 years.

= 50,000 × 2.4868 = Rs. 1,24,340/-

Present Value of an Annuity :

The present value of an annuity 'A' receivable at the end of every year for a period of n years at the rate of interest 'i' is equal to

$$PVA_n = \frac{A}{(1+i)} + \frac{A}{(1+i)^2} + \frac{A}{(1+i)^3} + \frac{A}{(1+i)^n}$$

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

Where, $\left[\dfrac{(1+i)^n - 1}{i(1+i)^n} \right]$ is called the PVIFA (Present Value of Interest Factor Annuity) and it represents the present value of Rs. 1 for the given values of i and n.

Illustration :

Calculate the present value of Rs. 100 deposited per month for 12 months @ 12% p.a., compounded quarterly.

Solution :

Step (1) Calculate effective rate of interest per annum

$$r = \left(1 + \frac{i}{m} \right)^m - 1$$

$$= \left(1 + \frac{0.12}{4} \right)^4 - 1$$

$$= 1.1255 - 1 = 0.1255$$

$$= 12.55\%$$

Where,   i = normal rate of interest p.a.

r = effective rate of interest p.a.

m = no. of terms compounded in a year.

Step (2) Calculate effective rate of interest per month.

$$= (1+r)^{\frac{1}{12}} - 1$$

$$= (1+0.1255)^{\frac{1}{12}} - 1$$

$$= 0.00990$$

Step (3) The present value of deposits :

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

$$= 100\left[\frac{(1+0.00990)^{12} - 1}{0.00990\,(1+0.00990)^{12}}\right]$$

$$= 100\left[\frac{0.1255}{0.01114}\right] = 100 \times 11.26 = \text{Rs. } 1126$$

INVESTMENT APPRAISAL TECHNIQUES

Pay back of Capital Employed	Accounting Profit for Project Evaluation	Time Value of Money
↓	↓	↓
Pay back Period Method	(a) Accounting Rate of Return (ARR) (b) Earnings per share (EPS)	(a) Net Present Value (NPV) (b) Internal Rate of Return (IRR) (c) Net Terminal Value (d) Profitability Index (e) Discounted payback period
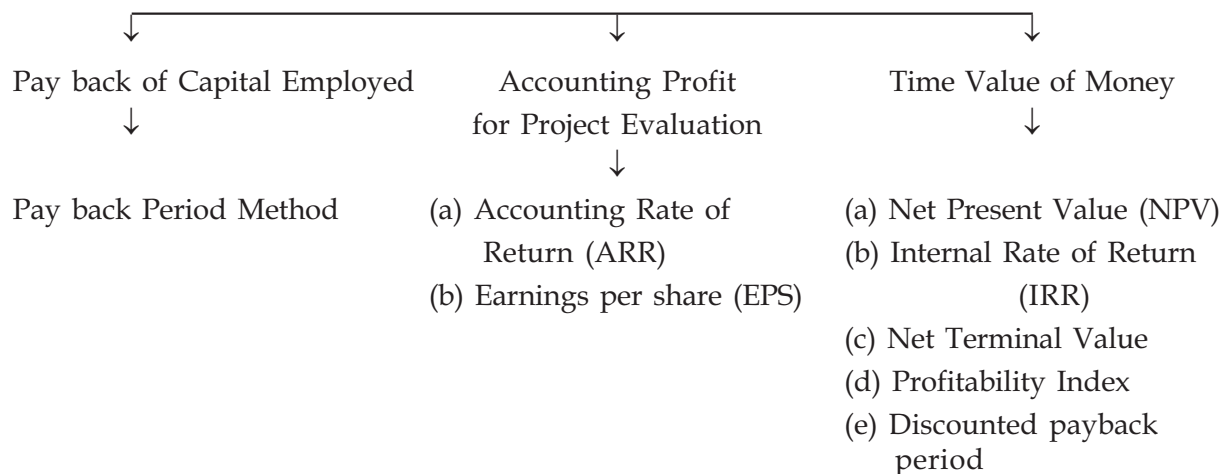
Payback Period Method

The basic element of this method is to calculate the recovery time, by yearwise accumulation of cash inflows (inclusive of depreciation) until the cash inflows equal the amount of the original investment. The time taken to recover such original investment is the "payback period" for the project.

"The shorter the payback period, the more desirable a project".

Illustration : Initial Investment = Rs. 1,00,000

Expected future cash inflows Rs. 20,000, Rs. 40,000, Rs. 60,000, Rs. 70,000

Solution :

Calculation of Pay Back period.

Year	Cash Inflows (Rs.)	Cumulative Cash Inflows (Rs.)
1	20,000	20,000
2	40,000	60,000
3	60,000	1,20,000
4	70,000	1,90,000

The initial investment is recovered between the 2nd and the 3rd year.

$$\therefore \text{Pay back Preiod} = 2 \text{ years} + \left(\frac{\text{Balance of Unrecovered Initial Investment}}{\text{Cash Inflows during the year}} \times 12 \right)$$

$$= 2 \text{ years} + \frac{\text{Initial Investment} - \text{Cumulative}}{\text{Cash Inflows at the end of 2}^{nd} \text{ year}}{\text{Cash Inflows in the 3rd year}} \times 12$$

$$= 2 \text{ years} + \left(\frac{1,00,000 - 60,000}{60,000} \times 12 \right)$$

$$= 2 \text{ years} + \left(\frac{40,000}{60,000} \times 12 \right)$$

$$= 2 \text{ years } 8 \text{ months.}$$

Illustration : Victory Ltd. decided to purchase a machine to increase the installed capacity. The company has four machines under consideration. The relevant details including estimated yearly expenditure and sales are given below. All sales are for cash. Corporate Tax Rate @ 33.99% (inclusive of Surcharge @ 10%, Deduction cess @ 2% and Secondary & Higher Education cess @ 1%)

Particulars	M_1	M_2	M_3	M_4
Initial Investment (Rs. lacs)	30.00	30.00	40.00	35.00
Estimated Annual Sales (Rs. lacs)	50.00	40.00	45.00	48.00
Cost of Production (Estd) (Rs. lacs)	18.00	14.00	16.70	21.00
Economic Life (yrs)	2	3	3	4
Scrap Values (Rs. lacs)	4.00	2.50	3.00	5.00

Calculate Payback Period

Solution :   **Statement Showing Payback for four machines**

Particulars	M_1	M_2	M_3	M_4
(1) Initial Investment (Rs. lacs)	30.00	30.00	40.00	35.00
(2) Estd. Annual Sales (Rs. Lacs)	50.00	40.00	45.00	48.00
(3) Estd. Cost of Production (Rs. lacs)	18.00	14.00	16.70	21.00
(4) Depreciation (Rs. lacs)	13.00	9.17	12.33	7.50

	M₁	M₂	M₃	M₄
(5) Profit Before Tax (PBT) [2–3–4]	19.00	16.83	15.97	19.50
(6) Tax @ 33.99% (Rs. lacs)	6.4581	5.721	5.428	6.628
(7) Profit After Tax (PAT) [5–6] (Rs. lacs)	12.5419	11.109	10.542	12.872
(8) Net Cash Flow [7+4]	25.5419	20.279	22.872	20.372

	$\mathbf{M_1}$	$\mathbf{M_2}$	$\mathbf{M_3}$	$\mathbf{M_4}$
Pay back Period (Years)	$=\dfrac{30.00}{25.5419}$	$=\dfrac{30.00}{20.279}$	$=\dfrac{40.00}{22.872}$	$=\dfrac{35.00}{20.372}$
$\left[\dfrac{\text{Initial Investment}}{\text{Net Annual Cash Flow}}\right]$	= 1.17	= 1.48	= 1.75	= 1.72

Analysis : Machine 1 is more profitable, as it has the lowest payback period.

Bailout Factor

This deals with the posibility of scrapping the machine during its estimated life.

Illustration :

Project × costs Rs. 20 lacs and project y costs Rs. 30 lacs both having a life of 5 years. Expected cash flows Rs. 8 lacs p.a. for project × and Rs. 15 lacs p.a. for project y. Estimated scrap values of project × Rs. 5 lacs, declining at an annual rate of Rs. 1 lacs p.a. and of project y Rs. 8 lacs declining at an annual rate of Rs. 1 lac p.a.

Under Traditional payback :

$$\text{Project X} = \frac{20,00,000}{8,00,000} = 2.5 \text{ years}$$

$$\text{Project Y} = \frac{30,00,000}{15,00,000} = 2 \text{ years}$$

Under Bailout Payback :

The bailout payback time is reached if the accumulated cash inflows plus the expected salvage value at the end of a particular year equals the original/initial investment.

Project X	Cumulative Cash Receipts (Rs.)	Salvage Value (Rs.)	
End of year 1 :	8,00,000	5,00,000	= 13,00,000
End of year 2 :	16,00,000	4,00,000	= 20,00,000

∴ Bailout payback period for Project X = 2 years.

Project Y	Cumulative Cash Receipts (Rs.)	Salvage Value (Rs.)	
End of year 1 :	15,00,000	8,00,000	= 23,00,000
End of year 2 :	30,00,000	7,00,000	= 37,00,000

∴ Bailout is between **years 1** & **years 2**.

∴ Project Y is choosen having a lower bailout pay back period, assuming that the major objective is to avoid loss.

Merits :

    (1) No assumptions about future interest rates.

    (2) In case of uncertainty in future, this method is most appropriate.

    (3) A company is compelled to invest in projects with shortest payback period, if capital is a constraint.

    (4) It is an indication for the prospective investors specifying the payback period of their investments.

    (5) Ranking projects as per their payback period may be useful to firms undergoing liquidity constraints.

Demerits :

    (1) Cash generation beyond payback period is ignored.

    (2) The timing of returns and the cost of capital is not considered.

    (3) The traditional payback method does not consider the salvage value of an investment.

    (4) Percentage Return on the capital invested is not measured.

    (5) Projects with long payback periods are characteristically those involved in long-term planning, which are ignored in this approach.

Payback Period Reciprocal

Payback period may be expressed alternatively as the "payback reciprocal" :

$$\text{Payback period reciprocal} = \frac{1}{\text{Payback preiod}} \times 100$$

Illustration :

If the payback period for a project is 5 years, then the payback period reciprocal would be :

$$\left[\frac{1}{5} \times 100\right] = 20\%$$

The projects having lower payback period shall yield higher payback reciprocal, which reflects the worth of such project.

Accounting Rate of Return

This method measures the increase in profit expected to result from investment.

$$\text{ARR} = \frac{\text{Average Annual Profit After Tax}}{\text{Average or Initial Investment}} \times 100$$

$$= \frac{\text{Average EBIT}\,(1-t)}{\text{Average Investment}} \times 100$$

Where, Average Investment $= \dfrac{\text{Initial Investment} + \text{Salvage Value}}{2}$

Illustration :

A project costing Rs. 10 lacs. EBITD (Earnings before Depreciation, Interest and Taxes) during the first five years is expected to be Rs. 2,50,000; Rs. 3,00,000; Rs. 3,50,000; Rs. 4,00,000 and Rs. 5,00,000. Assume 33.99% tax and 30% depreciation on WDV Method.

Solution :

Computation of Project ARR :

Particulars	Yr 1	Yr 2	Yr3	Yr 4	Yr 5	Average
	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.
EBITD	2,50,000	3,00,000	3,50,000	4,00,000	5,00,000	3,60,000
Less : Depreciation	3,00,000	2,10,000	1,47,000	1,02,900	72,030	1,66,386
EBIT	(50,000)	90,000	2,03,000	2,97,100	4,27,970	1,93,614
Less : Tax @ 33.99%	—	13,596	69,000	1,00,984	1,45,467	65,809
	(50,000)	76,404	1,34,000	1,96,116	2,82,503	1,27,805

Book Value of Investment :

Begining	10,00,000	7,00,000	4,90,000	3,43,000	2,40,100	
End	7,00,000	4,90,000	3,43,000	2,40,100	1,68,070	
Average	8,50,000	5,95,000	4,16,500	2,91,550	2,04,085	4,71,427

$$\text{ARR} = \frac{\text{Average EBIT } (1-t)}{\text{Average Investment}} \times 100 = \frac{1,27,805}{4,71,427} \times 100$$

$$= 27.11\%$$

Note : Unabsorbed depreciation of Yr. 1 is carried forward and set-off against profits of Yr. 2. Tax is calculated on the balance of profits

$$= 33.99\% \ (90,000 - 50,000)$$

$$= 13,596/-$$

Merits

(1) This method considers all the years in the life of the project.

(2) It is based upon profits and not concerned with cash flows.

(3) Quick decision can be taken when a number of capital investment proposals are being considered.

Demerits

(1) Time Value of Money is not considered.

(2) It is biased against short-term projects.

(3) The ARR is not an indicator of acceptance or rejection, unless the rates are compared with the arbitrary management target.

(4) It fails to measure the rate of return on a project even if there are uniform cash flows.

Earnings Per Share (EPS)

EPS is one of the major criterion for capital investment appraisal. The value of a firm is maximised if the market price of equity shares are maximised.

$$EPS = \left[\frac{(EBIT - I)(1 - t) - D}{n} \right]$$

Where EBIT = Earnings before Interest and Tax

I = Interest

t = Corporate tax rate

D = Preference Dividend

n = no. of equity shares

Note : The major drawback of this method is that it ignores cash flows, timing and risk.

Net Present Value (NPV) Method

= Present Value of Cash Inflows – Present Value of Cash Outflows

The discounting is done by the entitiy's weighted average cost of capital.

The dicounting factors is given by : $\dfrac{1}{(1+i)^n}$

Where i = rate of interest per annum

n = no. of years over which discounting is made.

Illustration :

Z Ltd. has two projects under considereation A & B, each costing Rs. 60 lacs.

The projects are mutually exclusive. Life for project A is 4 years & project B is 3 years. Salvage value NIL for both the projects. Tax Rate 33.99%. Cost of Capital is 15%.

Net Cash Inflow (Rs. Lakhs)

At the end of the year	Project A	Project B	P.V. @ 15%
1	60	100	0.870
2	110	130	0.756
3	120	50	0.685
4	50	—	0.572

Solution :

Computation of Net Present Value of the Projects.

	Project A			(Rs. lakhs)
	Yr. 1	Yr. 2	Yr. 3	Yr. 4
1. Net Cash Inflow	60.00	110.00	120.00	50.00

2. Depreciation	15.00	15.00	15.00	15.00
3. PBT (1–2)	45.00	95.00	105.00	35.00
4. Tax @ 33.99%	15.30	32.29	35.70	11.90
5. PAT (3–4)	29.70	62.71	69.30	23.10
6. Net Cash Flow (PAT+Dep^n)	44.70	77.71	84.30	38.10
7. Discounting Factor	0.870	0.756	0.685	0.572
8. P.V. of Net Cash Flows	38.89	58.75	57.75	21.79

9. Total P.V. of Net Cash Flow = 177.18

10. P.V. of Cash outflow (Initial Investment) = 60.00

Net Present Value = 117.18

Project B

	Yr. 1	Yr. 2	Yr. 3
1. Net Cash Inflow	100.00	130.00	50.00
2. Depreciation	20.00	20.00	20.00
3. PBT (1–2)	80.0	110.00	30.00
4. Tax @ 33.99%	27.19	37.39	10.20
5. PAT (3–4)	52.81	72.61	19.80
6. Next Cash Flow (PAT+Dep.)	72.81	92.61	39.80
7. Discounting Factor	0.870	0.756	0.685
8. P.V. of Next Cash Flows	63.345	70.013	27.263

9. Total P.V. of Cash Inflows = 160.621

10. P.V. of Cash Outflows = 60.00
(Initial Investment)

Net Present Value = 100.621

As Project "A" has a higher Net Present Value, it has to be taken up.

Merits

(1) It recognises the Time Value of Money.

(2) It considers total benifits during the entire life of the Project.

(3) This is applicable in case of mutually exclusive Projects.

(4) Since it is based on the assumptions of cash flows, it helps in determining Shareholders Wealth.

Demerits

(1) This is not an absolute measure.

(2) Desired rate of return may vary from time to time due to changes in cost of capital.

(3) This Method is not effective when there is disparity in economic life of the projects.

(4) More emphasis on net present values. Initial investment is not given due importance.

Internal Rate of Return (IRR)

Internal Rate of Return is a persentage discount rate applied in capital investment desions which brings the cost of a project and its expected future cash flows into equality, i.e., NPV is zero.

Illustration :

Project Cost	Rs. 1,10,000

Cash Inflows :

Year 1	Rs. 60,000
" 2	Rs. 20,000
" 3	Rs. 10,000
" 4	Rs. 50,000

Calculate the Internal Rate of Retun.

Solution :

Internal Rate of Return will be calculated by the trial and error method. The cash flow is not uniform. To have an approximate idea about such rate, we can calculate the "Factor". It represent the same relationship of investment and cash inflows in case of payback claculation :

$$F = I/C$$

Where   F = Factor

I = Original investment

C = Average Cash inflow per annum

$$\text{Factor for the project} = \frac{110{,}000}{35{,}000} = 3.14$$

The factor will be located from the table "P.V. of an Annuity of Rs. 1" representing number of years coresponding to estimated useful life of the asset.

The approximate value of 3.14 is located against 10% in 4 years.

We will now apply 10% and 12% to get (+) NPV and (–) NPV [Which means IRR lies in between]

Year	Cash Inflows (Rs.)	P.V. @ 10%	DCFAT (Rs.)	P.V. @ 12%	DCFAT (Rs.)
1	60,000	0.909	54,540	0.893	53,580
2	20,000	0.826	16,520	0.797	15,940
3	10,000	0.751	7,510	0.712	7,120
4	50,000	0.683	34,150	0.636	31,800

	P.V. of Inflows	1,12,720	1,08,440
Less : Initial Investment		1,10,000	1,10,000
	NPV	2,720	(1,560)

Graphically,

For 2%, Difference = 4,280
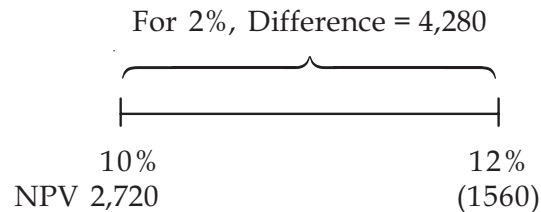
10%	12%
NPV 2,720	(1560)

IRR may be calculated in two ways :

Forward Method : Taking 10%, (+) **NPV**

$$IRR = 10\% + \frac{NPV\,at\,10\%}{Total\,Difference} \times Difference\,in\,Rate$$

$$= 10\% + \frac{2720}{4280} \times 2\%$$

$$= 10\% + 1.27\% = 11.27\%$$

Backward Method : Taking 12%, (–) **NPV**

$$IRR = 12\% + \frac{(1560)}{4280} \times 2\%$$

$$= 12\% - 0.73\% = 11.27\%$$

The decision rule for the internal rate of retern is to invest in a project if its rate of return is greater than its cost of capital.

For independent projects and situations involving no capital rationing, then :

Situation	Signifies	Decision
IRR = Cost of Capital	The investment is expected not to change shareholder wealth	Indifferent between Accepting & Rejecting
IRR > Cost of Capital	The investment is expected to increase shareholders wealth	Accept
IRR < Cost of Capital	The investment is expected to decrease shareholders wealth	Reject

Merits :

 (i) The Time Value of Money is considered.

(ii) All cash flows in the project are considered.

Demerits

 (i) Possibility of multiple IRR, interpretation may be difficult.

 (ii) If two projects with different inflow/outflow patterns are compared, IRR will lead to peculiar situations.

 (iii) If mutually exclusive projects with different investments, a project with higher investment but lower IRR contributes more in terms of absolute NPV and increases the shareholders' wealth.

NPV-IRR Conflict

Let us consider two mutually exclusive projects A & B.

	Project A	Project B	Decision
Cost of Capital	10%	10%	
IRR	13%	11%	Project A
NPV	1,00,000	1,10,000	Project B

When evaluating mutually exclusive projects, the one with the highest IRR may not be the one with the best NPV.

The conflict between NPV & IRR for the evaluation of mutually exclusive projects is due to the reinvestment assumption :

 ● NPV assumes cash flows reinvested at the cost of capital.

 ● IRR assumes cash flows reinvested at the internal rate of return.

The reinvestment assumption may cause different decisions due to :

 ● Timing difference of cash flows.

 ● Difference in scale of operations.

 ● Project life disparity.

Terminal Value Method

Assumption :

 (1) Each cash flow is reinvested in another project at a predetermined rate of interest.

 (2) Each cash inflow is reinvested elsewhere immediately after the completion of the project.

Decision-making

If the P.V. of Sum Total of the Compound reinvested cash flows is greater than the P.V. of the outflows of the project under consideration, the project will be accepted otherwise not.

Illustration :

Original Investment	Rs. 40,000
Life of the project	4 years
Cash Inflows	Rs. 25,000 for 4 years
Cost of Capital	10% p.a.

Expected interest rates at which the cash inflows will be reinvested :

Year-end	1	2	3	4
%	8	8	8	8

Solution :

First of all, it is necessary to find out the total compounded sum which will be discounted back to the present value.

Year	Cash Inflows (Rs.)	Rate of Int. (%)	Yrs. of Investment (Rs.)	Compounding Factor	Total Compounding Sum (Rs.)
1	25,000	8	3	1.260	31,500
2	25,000	8	2	1.166	29,150
3	25,000	8	1	1.080	27,000
4	25,000	8	0	1.000	25,000
					1,12,650

Present Value of the sum of compounded values by applying the discount rate @ 10%

$$\text{Present Value} = \frac{\text{Compounded Value of Cash Inflow}}{(1+i)^n}$$

$$= \frac{1,12,650}{(1.10)^4}$$

$$= 1,12,650 \times 0.683 = 76,940/\text{-}$$

[0.683 being the P.V. of Re. 1 receivable after 4 years]

Decision : The present value of reinvested cash flows, *i.e.*, Rs. 76,940 is greater than the original cash outlay of Rs. 40,000.

The project should be accepted as per the terminal value criterion.

Profitability Index :

$$\text{Profitability Index} = \frac{\text{P.V. of cash inflow}}{\text{P.V. of cash outflow}}$$

If   P.I > 1,   project is accepted

       P.I < 1,   project is rejected

The PI signifies present value of inflow per rupee of outflow. It helps to compare projects involving different amounts of initial investments.

Illustration :

Initial investment Rs. 20 lacs. Expected annual cash flows Rs. 6 lacs for 10 years. Cost of Capital @ 15%.

Calculate Profitability Index.

Solution :

   Cumulative discounting factor @ 15% for 10 years = 5.019

   ∴ P.V. of inflows = 6.00 × 5.019 = Rs. 30.114 lacs.

$$\therefore \text{Profitability Index} = \frac{\text{P.V. of Inflows}}{\text{P.V. of Outflows}} = \frac{30.114}{20} = 1.51$$

Decision : The project should be accepted.

Discounted Payback Period

In Traditional Payback period, the time value of money is not considered. Under discounted payback period, the expected future cash flows are discounted by applying the appropriate rate, i.e., the cost of capital.

Illustration :

Initial Investment Rs. 1,00,000

Cost of Capital @ 12% p.a.

Expected Cash Inflows

Yr. 1	Rs. 25,000
Yr. 2	Rs. 50,000
Yr. 3	Rs. 75,000
Yr. 4	Rs. 1,00,000
Yr. 5	Rs. 1,50,000

Calculate Discounted Payback Period.

Solution :

Year	Cash Inflows (Rs.)	Discounting Factor @ 12%	Discounted Cash Flows (Rs.)	Cumulative DCF (Rs.)
1	25,000	0.8929	22,323	22,323
2	50,000	0.7972	39,860	62,183
3	75,000	0.7117	53,378	1,15,561
4	1,00,000	0.6355	63,550	1,79,111
5	1,50,000	0.5674	85,110	2,64,221

The recovery was made between 2nd and 3rd year.

$$\text{Discounted Payback Period} = 2 \text{ years} + \frac{1,00,000 - 62,183}{1,15,561 - 62,183} \times 12$$

$$= 2 \text{ years} + \frac{37,817}{1,15,561 - 62,183} \times 12 = 2 \text{ years} + \frac{37817}{53378} \times 12$$

$$= 2 \text{ years } 8\frac{1}{2} \text{ months.}$$

CAPITAL RATIONING :

Capital rationing is a situation where a constraint or budget ceiling is placed on the total size of capital expenditures during a particular period. Often firms draw up their capital budget under the assumption that the availability of financial resources is limited.

Under this situation, a decision maker is compelled to reject some of the viable projects having positive net present value because of shortage of funds. It is known as a situation involving capital rationing.

Factors Leading to Capital Rationing - Two different types of capital rationing situation can be identified, distinguished by the source of the capital expenditure constraint.

I. **External Factors** - Capital rationing may arise due to external factors like imperfections of capital market or deficiencies in market information which might have for the availability of capital. Generally, either the capital market itself or the Government will not supply unlimited amounts of investment capital to a company, even though the company has identified investment opportunities which would be able to produce the required return. Because of these imperfections the firm may not get necessary amount of capital funds to carry out all the profitable projects.

II. **Internal Factors** - Capital rationing is also caused by internal factors which are as follows:

- Reluctance to take resort to financing by external equities in order to avoid assumption of further risk

- Reluctance to broaden the equity share base for fear of losing control.

- Reluctance to accept some viable projects because of its inability to manage the firm in the scale of operation resulting from inclusion of all the viable projects.

Situations of Capital Rationing

Situation I - Projects are divisible and constraint is a single period one:

The following are the steps to be adopted for solving the problem under this situation:

- a. Calculate the profitability index of each project
- b. Rank the projects on the basis of the profitability index calculated in (a) above.
- c. Choose the optimal combination of the projects.

Situation II - Projects are indivisible and constraint is a single period one

The following steps to be followed for solving the problem under this situation:

- a. Construct a table showing the feasible combinations of the project (whose aggregate of initial outlay does not exceed the fund available for investment.
- b. Choose the combination whose aggregate NPV is maximum and consider it as the optimal project mix.

PROBLEMS

Illustration 1 : Zenith Industrial Ltd. are thinking of investing in a project costing Rs. 20 lakhs. The life of the project is five years and the estimated salvage value of the project is zero. Straight line method of charging depreciation is followed. The tax rate is 50%. The expected cash flows before tax are as follows :

Year	1	2	3	4	5
Estimated Cash flow before depreciation and tax (Rs. lakhs)	4	6	8	8	10

You are required to determine the : *(i)* Payback Period for the investment, *(ii)* Average Rate of Return on the investment, *(iii)* Net Present Value at 10% Cost of Capital, *(iv)* Benefit-Cost Ratio.

Solution :

Calculation of Annual Cash Inflow After Tax *(Rs. lakhs)*

Particulars	1 year	2 year	3 year	4 year	5 year
Cash inflow before depreciation and tax	4	6	8	8	10
Less : Depreciation	4	4	4	4	4
EBT	–	2	4	4	6
Less : Tax @ 50%	–	1	2	2	3
EAT	–	1	2	2	3
Add : Depreciation	4	4	4	4	4
Cash inflow after tax	4	5	6	6	7

(i) **Pay Back Period :**

Year	Cash inflow after tax	Cumulative cash inflow after tax
1	4	4
2	5	9
3	6	15
4	6	21
5	7	28

$$\text{Pay Back Period} = 3\,\text{years} + \frac{\text{Rs.}\,5\,\text{lacks}}{\text{Rs.}\,6\,\text{lakhs}} \times 12\,\text{Months} = 3\,\text{years}\,10\,\text{months}$$

(ii) **Average Rate of Return**

Average return	= Rs. 8 lakhs/5 years	= Rs. 1.6 lakhs
Average investment	= Rs. 20 lakhs/2	= Rs. 10 lakhs

$$\text{Average rate of return} = \frac{1.6}{10} \times 100 \qquad = 16\%$$

(iii) **Net Present Value at 10% Cost of Capital** *(Rs. lakhs)*

Year	Cash inflow after tax	Discount factor @ 20%	Present Value
1	4	0.909	3.636
2	5	0.826	4.130
3	6	0.751	4.506
4	6	0.683	4.098
5	7	0.621	4.347
P.V. of cash inflows			20.717
Less : Initial investment			20.00
NPV			0.717

(iv) **Benefit-Cost Ratio** $= \dfrac{\text{P. V. of cash inflow}}{\text{P.V. of cash outflow}} = \dfrac{20.717}{20} = 1.036$

Illustration 2 : The relevant information for two alternative systems of internal transportation are given below :

(Rs. Million)

Particulars	Sysem 1	System 2
Initial investment	6	4
Annual operating costs	1	0.9
Life	6 years	4 years
Salvage value at the end	2	1.5

Which system would you prefer if the cost of capital is 6%? Justify your recommendation with appropriate analysis.

[Present value of annuity at 6% for 6 years = 4.917 and for 4 years = 3.465. Present value of Rs. 1.00 at 6% at the end of 6the year 0.705 and that at the end of 4th year 0.792].

Solution :

P.V. of Costs of Internal Transportation - System 1   *(Rs. Million)*

Initial investment	(6×1.000)	6.000
Add : Annual operating cost	(1×4.917)	4.917
		10.917
Less : Salvage value at the end of 6 years	(2×0.705)	1.410
P.V. cash outflow		9.507

P.V. of Costs of Internal Transportation - System 2   *(Rs. Million)*

Initial investment	(4×1.000)	4.000
Add : Annual operating cost	(0.9×3.465)	3.1185
		7.1185
Less : Salvage value at the end of 6 years	(1.5×0.792)	1.188
P.V. cash outflow		5.9305

Equivalent Annual Cost

System 1 $= \dfrac{9.507}{4.917} = $ Rs. 1.93 Million   System 2 $= \dfrac{5.9305}{3.465} = $ Rs. 1.71 Million

Analysis : The equivalent annual cost of System 2 is less than Sysem 1. Hence, System 2 is suggested to takeup.

Illustration 3 : A company is considering which of two mutually exclusive projects is should undertake. The Finance Director thinks that the project with the higher NPV should be chosen whereas the Managing Director think that the one with the higher IRR should be undertaken especially as both projects have the same initial outlay and length of life. The company anticipates a cost of capial of 10% and the net after-tax cash flows of the projects are as follows :

Year	0	1	2	3	4	5
Cash Flows :						
Project X	(200)	35	80	90	75	20
Project Y	(200)	218	10	10	4	3

Required :

(a) Calculate the NPV and IRR of each project.

(b) Sate, with reasons, which project you would recommend.

(c) Explain the inconsistency in the ranking of the two projects.

The discount factors are as follows :

Year	0	1	2	3	4	5
Discount Factors : (10%)	1	0.91	0.83	0.75	0.68	0.62
(20%)	1	0.83	0.69	0.58	0.48	0.41

Solution :

(a) **Calculation of the NPV and IRR of each Project**

NPV of Project X

Year	Cash Flows	Discount Factors @ 10%	Discounted Values	Discount Factors @ 20%	Discounted Values
0	(200)	1.00	(200)	1.00	(200)
1	35	0.91	31.85	0.83	29.05
2	80	0.83	66.40	0.69	55.20
3	90	0.75	67.50	0.58	52.20
4	75	0.68	51.00	0.48	36.00
5	20	0.62	12.40	0.41	8.20
NPV			**+ 29.15**		**– 19.35**

IRR of Project X

At 20% NPV is – 19.35

At 10% NPV is + 29.15

$$\text{IRR} = 10 + \frac{29.15}{29.15 + 19.35} \times 10 \qquad = 10 + \frac{29.15}{48.50} \times 10 \quad = 16.01\%$$

NPV of Project Y

Year	Cash Flows	Discount Factors @ 10%	Discounted Values	Discount Factors @ 20%	Discounted Values
0	(200)	1.00	(200)	1.00	(200)
1	218	0.91	198.38	0.83	180.94
2	10	0.83	8.30	0.69	6.90
3	10	0.75	7.50	0.58	5.80
4	4	0.68	2.72	0.48	1.92
5	3	0.62	1.86	0.41	1.23
NPV			+ 18.76		– 3.21
IRR of Project Y					

At 20% NPV is   – 3.21

At 10% NPV is   + 18.76

$$\text{IRR} = 10 + \frac{18.76}{18.76 + 3.21} \times 10 \qquad = 10 + \frac{18.76}{21.97} \times 10 \quad = \quad 18.54\%$$

(b) Both the projects are acceptable because they generate the positive NPV at the company's cost of Capital at 10%. However, the Company will have to select Project X because it has a higher NPV. If the company follows IRR method, then Project Y should be selected because of higher internal rate of return (IRR). But when NPV and IRR give contradictory results, a project with higher NPV is generally preferred because of higher return in absolute terms. Hence, Project X should be selected.

(c) The inconsistency in the ranking of the projects arises because of the difference in the pattern of cash flows. Project X's major cash flows occur mainly in the middle three years, whereas Y generates the major cash flows in the first itself.

Illustration 4 : Projects X and Y are analysed and you have determined the following parameters. Advice the investor on the choice of a project :

Particulars	Project X	Project Y
Invest	Rs. 7 cr.	Rs. 5 cr.
Project life	8 years	10 years
Construction period	3 years	3 years
Cost of capital	15%	18%
N.P.V. @ 12%	Rs. 3,700	Rs. 4,565
N.P.V. @ 18%	Rs. 325	Rs. 325
I.R.R.	45%	32%
Rate of return	18%	25%
Payback	4 years	6 years
B.E.P.	45%	30%
Profitability index	1.76	1.35

Solution :

Relative Ranking of Project X and Project Y

Particulars	Rank	
	Project X	**Project Y**
IRR	I	II
Rate of return	II	I
Pay back	I	II
Profitability index	I	II
NPV @ 12%	II	I
NPV @ 18%	Equal	Equal
B.E.P.	II	I
Cost of Capital	I	II

Analysis : The major criterion *i.e.*, IRR, Pay back and Profitability Index in which Project X is ranking first and hence it could be selected.

Illustration 5 : A company is contemplating to purchase a machine. Two machine A and B are available, each costing Rs. 5 lakhs. In comparing the profitability of the machines, a discounting rate of 10% is to be used and machine is to be written off in five years by straight line method of depreciation with *nil* residual value. Cash inflows after tax are expected as follows :

(Rs. in lakhs)

Year	Machine A	Machine B
1	1.5	0.5
2	2.0	1.5
3	2.5	2.0
4	1.5	3.0
5	1.0	2.0

Indicate which machine would be profitable using the following methods of ranking investment proposals :

(i) Pay back method : (ii) Net present value method; (iii) Profitability index method; and (iv) Averge rate of return method.

The discounting factors at 10% are—

Year	1	2	3	4	5
Discount factors	.909	.826	.751	.683	.621

Solution :

(i) Payback Period (PB) $= \dfrac{\text{Initial Investment}}{\text{Annual cash inflows}}$

Calculation of Payback Period :

Machine A *(Rs. lakhs)*

Year	Cash inflows		Payback years required
	Total	**Needed**	
1	1.50	1.50	1 year
2	2.00	2.00	1 year
3	2.50	1.50	$\left(\dfrac{1.50}{2.50} \times 12\right) = 7.2\ \text{months}$

Payback Period for Machine A = 2 years 7.2 months.

Machine B *(Rs. lakhs)*

Year	Cash inflows		Payback years required
	Total	**Needed**	
1	0.50	0.50	1 year
2	1.50	1.50	1 year
3	2.00	2.00	1year
4	3.00	1.00	(1/3 × 12) = 4 months
		5.00	

Payback period for Machine B = 3 years 4 months.

Rank : Machine-A-I, Machine-B-II; Machine A is more profitable.

(ii) **Calculation of Net Present Value of cash inflows for Machine A & Machine B.**

Years	Cash Inflows		Discount	P. V. of cash inflows	
	Machine A	**Machine B**	**Factor @ 10%**	**Machine A**	**Machine B**
1	1.5	0.5	.909	1.36	0.45
2	2.0	1.5	.826	1.65	1.24
3	2.5	2.0	.751	1.88	1.50
4	1.5	3.0	.683	1.02	2.05
5	1.0	2.0	.621	0.62	1.24
				6.53	6.48
Total P.V.				6.53	6.48
Initial Investment				5.00	5.00
Net Present Value (NPV)				1.53	1.48

Rank : Machine-A - I, Machine-B - II

Since Machine A has greater NPV compared to Machine B, Machine A is more profitable.

(iii) Calculation of Profitability Index   (Rs. lakhs)

	Machine A	Machine B
Profitability Index $= \dfrac{\text{Present value of Cash Inflows}}{\text{Present value of Cash Outflows}}$	$\dfrac{6.53}{5.00} = 1.306$	$\dfrac{6.48}{5.00} = 1.296$
Rank	I	II

Machine A is more profitable.

(iv) Calculation of Average Rate of Return $= \dfrac{\text{Average annual earnings}}{\text{Initial cost}} \times 100$

(Rs. lakhs)

	Machine A	Machine B
Total Cash inflow	8.50	9.00
Less : Depreciation for 5 years	5.00	5.00
Net earning after tax and depreciation	3.50	4.00
Life of machine (yrs.)	5	5
Average earnings per year	.70	0.80
Initial cost	5	5
ARR	$\left[\dfrac{0.70}{5.00} \times 100\right] = 14\%$	$\left[\dfrac{0.80}{5.00} \times 100\right] = 16\%$
Rank	II	I

Machine B is more profitable.

Illustration 6 : Determine which of the following two mutually exclusive projects should be selected if they are :

(i) One-off investments or *(ii)* If they can be repeated indefinitely :

(Rs.)

Particulars	Project A	Project B
Investment	40,000	60,000
Life	4 years	7 years
Annual net cash inflows	15,000	16,000
Scrap value	5,000	3,000

Cost of capital is 15%. Ignore taxation. The Present Value of annuity for 4 years and 7 years at 15% are respectively 2.8550 and 4.1604 and the discounting factors at 4 years/7 years respectively 0.5718 and 0.3759.

Solution :

(i) Project A *(Rs.)*

Year	Cash flow	Discount factor	Present value
0	(40,000)	1.0000	(40,000)
1-4	15,000	2.8550	42,825
4	5,000	0.5718	2,859
			NPV = 5,684

(i) Project B *(Rs.)*

Year	Cash flow	Discount factor	Present value
0	(60,000)	1.0000	(60,000)
1-7	16,000	4.1604	66,566
7	3,000	0.3759	1,128
			NPV = 7,694

Suggestion : If Projects A and B are one-off investments, then Project B is preferable.

(ii) Uniform Annual Equivalent

$$A = \frac{5684}{2.8550} = 1991 \qquad B = \frac{7694}{4.1604} = 1849$$

Suggestion : Choose Project A for continual repeats.

Illustration 7 : Company X is forced to choose between two machines A and B. The two machines are designed differently, but have identical capacity and do exactly the same job. Machine A costs Rs. 1,50,000 and will last for 3 years. It costs Rs. 40,000 per year to run. Machine B is an 'economy' model costing only Rs. 1,00,000, but will last only for 2 years, and costs Rs 60,000 per year to run. These are real cash flows. The costs are forcasted in rupees of constant purchasing power. Ignore tax. Opportunity cost of capital is 10 per cent. Which machine company X should buy?

Solution :

Working Notes :

Compound present value of 3 years @ 10%	=	2.486	
P.V. of Running cost of Machine A for 3 years	=	Rs. 40,000×2.486	= Rs. 99,440
Compound present value of 2 years @ 10%	=	1.735	
P.V. of Running cost of Machine B for 2 years	=	Rs. 60,000×1.735	= Rs. 1,04,100

Statement showing evaluation of Machine A and B *(Rs.)*

Particulars	Machine A	Machine B
Cost of purchase	1,50,000	1,00,000
Add : P.V. of running cost for 3 years	99,440	1,04,100
	2,49,440	2,04,100

P.V. of Cash outflow	2,49,440	2,04,100
	2.486	1.735
Equivalent Present value of annual Cash outflow	= 1,00,338	= 1,17,637

Analysis : Since the annual Cash outflow of Machine B is highest, Machine A can be purchased.

Illustration 8 : A particular project has a four-year life with yearly projected net profit of Rs. 10,000 after charging yearly Depreciation of Rs. 8,000 in order to write-off the capital cost of Rs. 32,000. Out of the Capital cost Rs. 20,000 is payable immediately (Year 0) and balance in the next year (which will be the Year 1 for evaluation). Stock amounting to Rs. 6,000 (to be invested in Year 0) will be required throughout the project and for Debtors a further sum of Rs. 8,000 will have to be invested in Year 1. The working capital will be recouped in Year 5. It is expected that the machinery will fetch a residual value of Rs. 2,000 at the end of 4th year. Income Tax is payable @ 40% and the Depreciation equals the taxation writting down allowances of 25% per annum. Income Tax is paid after 9 months after the end of the year when profit is made. The residual value of Rs. 2,000 will also bear Tax @ 40%. Although the project is for 4 years, for computation of Tax and realisation of working capital, the computation will be required up to 5 years.

Taking Discount factor of 10%, calculate NPV of the project and give your comments regarding its acceptability.

(*NPV Factors @ 10% - Year 1-0.9091; Yr. 2-0.8264; Yr. 3-0.7513; Yr. 4-0.6830; Yr. 5-0.6209*).

Solution :

Calculation of NPV of Project *(Rs.)*

Particulars		**Year**				
	0	**1**	**2**	**3**	**4**	**5**
Capital Expenditure	(20,000)	(12,000)	—	—	—	—
Working Capital	(6,000)	(8,000)	—	—	—	—
Net Profit	—	10,000	10,000	10,000	10,000	10,000
Depreciation Add back	—	—	8,000	8,000	8,000	8,000
Tax	—	—	(4,000)	(4,000)	(4,000)	(4,800)
Salvage value	—	—	—	—	2,000	—
Recovery of working Capital	—	—	—	—	—	14,000
Net Cash inflow	(26,000)	(10,000)	14,000	14,000	16,000	27,200
Discount factor @ 10%	1.000	0.9091	0.8264	0.7513	0.6830	0.6209
Present Value	(26,000)	(9,091)	11,570	10,518	10,928	16,688

Suggestion : Since NPV is Rs. 14,813 ; it is suggested to accept the proposal.

Illustration 9 : Following are the data on a capital project being evaluated by the Management of X Ltd. :

Project M

Annual cost saving	Rs. 40,000
Useful life	4 years
I.R.R.	15%
Profitability Index (PI)	1.064
NPV	?
Cost of capital	?
Cost of project	?
Payback	?
Salvage value	0

Find the missing values considering the following table of discount factor only :

Discount	15%	14%	13%	12%
1 year	0.869	0.877	0.885	0.893
2 year	0.756	0.769	0.783	0.797
3 year	0.658	0.675	0.693	0.712
4 year	0.572	0.592	0.613	0.636

Solution :

Calculation of Cost of Project *i.e.*, Initial Cash Outlay of Project M

Annual cost saving	= Rs. 40,000
Useful life	= 4 years
I.R.R.	= 15%

At 15% I.R.R., the total present value of cash inflows is equal to initial cash outlay.

Total present value of cash inflows @ 15% for 4 years is 2.855

$$= Rs. 40,000 × 2.855 = Rs. 1,14,200$$

∴ Project Cost is Rs. 1,14,200

Calculation of Payback Period of Project M

$$\text{Payback Period} = \frac{\text{Cost of project}}{\text{Annual cost saving}} = \frac{1,14,000}{40,000} = 2.855 \text{ or 2 years 11 months (approx.)}$$

Calculation of Cost of Capital

$$\text{Profitability Index} = \frac{\text{Discounted cash inflows}}{\text{Cost of Project}}$$

Profitability Index = 1.064 given

Cost of Project = Rs. 1,14,200

$$1.064 = \frac{\text{Present value of cash inflows}}{1,14,200}$$

Present value of cash inflows = 1.064 × 1,14,200   = Rs. 1,21,509

Cumulative Discount Factor for 4 years

$$= \frac{\text{Present value of cash inflows}}{\text{Annual cost saving}} = \frac{1,21,509}{40,000} = 3.038$$

Looking at present value table at compound discount factor for 4 years is 3.038

∴ Cos of capital = 12%

Calculation Net Present Value of Project

N.P.V   = Present Value of Total Cash Inflows - Cost of Project

                 = 1,21,509 – 1,14,200   = Rs. 7,309

Illustration 10 : XYZ Ltd. is manufacturer of high quality running shoes. Devang. President, is considering computerising the company's ordering, inventory and billing procedures. He estimates that the annual savings from computerisation include a reduction of 10 clerical employees with annual salaries of Rs. 15,000 each, Rs. 8,000 from reduced production delays caused by raw materials inventory problems, Rs. 12,000 from lost sales due to inventory stockouts and Rs. 3,000 associated with timely billing procedures.

The purchase price of the system is Rs. 2,00,000 and installation costs are Rs. 50,000. These outlays will be capitalised (depreciated) on a straight line basis to a zero book salvage value which is also its market value at the end of five years. Operation of the new system requires two computer specialists with annual salaries of Rs. 40,000 per person. Also tax rate is 40% and rate of return (cost of capital) for this project is 12%. Maintenance & Operating expenses is Rs. 12,000 p.a.

You are required to :

(i) Find the project's initial net cash outlay.

(ii) Find the project's operating and terminal value cash flows over its 5 year life.

(iii) Evaluate the project using NPV method.

(iv) Evaluate the project using PI method.

(v) Calculate the project's payback period.

(vi) Find the project's cash flows and NPV [part *(i)* through *(iii)*] assuming that the system can be sold for Rs. 25,000 at the end of five years even though the book salvage value will be zero, and

(vii) Find the project's cash flows and NPV [part *(i)* though *(iii)*] assuming that the book salvage value for depreciation pourposes is Rs. 20,000 even though the machine is worthless in terms of its resale value.

Note : (a) Present Value of annuity of Re. 1 at 12% rate of discount for 5 years is 3.605.

       (b) Present Value of Re. 1 at 12% rate of discount, received at the end of 5 years is 0.567.

Solution :

(i) Calculation of Project's initial net cash outlay   *(Rs.)*

Purchase price of system	2,00,000
Installation cost	50,000
Net cash outlay of project	2,50,000

(ii) Calculation of Project's Operating and Terminal Value cash flows over its 5 year life

(Rs.)

Savings

Reduction in salaries	(10 clerks×Rs. 15,000 p.a.)		1,50,000
Reduction in production delays			8,000
Reduction in lost sales			12,000
Savings from timely billing procedures			3,000
		(a)	1,73,000

Expenses

Depreciation			50,000
Salaries of computer specialists			80,000
Maintenance & Operating expenses			12,000
		(b)	1,42,000
Profit before tax		*(a) – (b)*	31,000
Less : Tax @ 40%			12,400
Profit after tax			18,600
Add : Depreciation			50,000
Net cash inflows p.a. for 1 to 5 years			68,600

(iii) Evaluation of Project using NPV method

(Rs.)

Year	Cash inflow	P.V. @ 12%	Total P.V.
0	(2,50,000)	1.000	(2,50,000)
1 to 5	68,600	3.605	2,47,303
		NPV	−2,697

Analysis : Since NPV is negative, the project cannot be accepted under NPV method.

(iv) Evaluation of Project using PI method

$$\text{Profitability Index (PI)} = \frac{\text{Present value of cash inflows}}{\text{Present value of outflows}} = \frac{2,47,303}{2,50,000} = 0.99$$

Analysis : Since Profitability Index is less than 1, the Project cannot be accepted under this method.

(v) Calculation of the Project's Payback Period :

(Rs.)

Year	Net cash inflows	Cumulative cash inflow
1	68,600	68,600
2	68,600	1,37,200
3	68,600	2,05,800
4	68,600	2,74,400
5	68,600	3,43,000

The payback period is 3 years and fraction of the 4th year. The fraction year is calculated as under :

$$= \frac{44,200}{68,600} = 0.64$$

Hence, the payback period is 3.64 years.

(vi) Calculation of Project Cash flows and NPV assuming that the system can be sold for Rs. 25,000 at the end of 5 years.

Year	Cash flows	P.V. @ 12%	Total P.V.
0	(2,50,000)	1.000	(2,50,000)
1 to 5	68,600	3.605	2,47,303
5	15,000*	0.567	8,505
		NPV	5,808

* Post tax salvage value = 25,000 (1-0.40) = Rs. 15,000

Analysis : Since NPV is positive, the project can be selected.

(vii) Calculation of project's cash flows and NPV assuming that the book salvage value for depreciation purposes is Rs. 20,000 even though the machine is worthless in terms of its resale value :

$$\text{Depreciation p.a.} = \frac{2,50,000 - 20,000}{5 \text{ years}} = \text{Rs. } 46,000 \text{ p.a.}$$

Cash Inflow p.a. *(Rs.)*

Savings		1,73,000
Less : Depreciation	46,000	
Salaries of computer specialists	80,000	
Maintenance cost	12,000	1,38,000
Profit before tax		35,000
Less : Tax @ 40%		14,000
Profit after tax		21,000
Add : Depreciation		46,000
Cash Inflow p.a.		67,000

Year	Cash flows Rs.	P.V. factor @ 12%	Total P.V. Rs.
0	(2,50,000)	1.000	(2,50,000)
1 to 5	67,000	3.605	2,41,535
5 (tax credit)	8,000	0.567	4,536
		NPV	(3,929)

Analysis : Since NPV is negative, Project can be rejected.

Illustration 11 : Xpert Engineering Ltd. is considering buying one of the following two mutually exclusive investment projects :

Project A : Buy a machine that requires an initial investment outlay of Rs. 1,00,000 and will generate the cash flows after tax (CFAT) of Rs. 30,000 per year for 5 years.

Project B : Buy a machine that requires an initial investment outlay of Rs. 1,25,000 and will generate 'cash flows after tax' (CFAT) of Rs. 27,000 per year for 8 years.

Which project should be undertaken? The company uses 10% cost of capital to evaluate the projects.

Note : Present value of Re. 1 for eight years @10% - 0.9091, 0.8264, 0.7513, 0.6830, 0.6209, 0.5645, 0.5132, and 0.4665.

Solution :

Calculation of Net Present Value

Project A   *(Rs.)*

Initial Investment	(1,00,000×1.000)	(1,00,000)
Cash Inflow After Tax	(30,000×3.791)	1,13,730
NPV		13,730

Project B   *(Rs.)*

Initial Investment	(1,25,000×1.000)	(1,25,000)
Cash Inflow After Tax	(27,000×5.335)	1,44,045
NPV		19,045

Equivalent Annual NPV

Project A = 13,730/3.791 = Rs. 3,622   Project B = 19,045/5.335 = Rs. 3,570

Analysis

- If it is one time Project, Project B suggested, since its NPV is greater than Project A
- If a Project is to be replaced every time after the end of economic life of earlier Project, then Project A is preferable, since its equivalent annual NPV is higher than Project B.

Illustration 12 : XYZ Ltd., an infrastructure company is evaluating proposal to build, operate and transfer a section of 35 kms. of road at a projcet cost of Rs. 200 crores to be financed as follows :

Equity Share Capital Rs. 50 crores, loan at the rate of interst of 15% p.a. from financial institutions Rs. 150 crores. The Project after completion will be opened to traffic and a toll will be collected for a period of 15 years from the vehicles using the road. The company is also required to maintain the road during the above 15 years and after the completeion of that period, it will be handed over to the Highway Authorities at zero value. It is estimated that the toll revenue will be Rs. 50 crores per annum and the annual toll collection expenses including maintenance of the roads will amount to 5% of the project cost. The company considers to write off the total cost of the project in 15 years on a straight line basis. For Corporate Income-tax purposes the company is allowed to take depreciation @ 10% on WDV basis. The financial institutions are agreeable for the repayment of the loan in 15 equal annual instalments–consisting of principal and interest.

Calculate Project IRR. Ignore Corporate taxation.

Solution :

Road Project cost	= Rs. 200 crores
Financed by :	
Equity Share Capital	= Rs. 50 crores
Term Loan from financial institutions @ 15% p.a.	= Rs. 150 crores
Annual net cash inflows	= Rs. 50 crores - 5% of Rs. 200 crores
	= Rs. 40 crores
Maintenance of road	= 15 years
Salvage value at the end of 15 years	= NIL

Calculation of IRR

$$\text{Factor to be located} = \frac{\text{Original investment}}{\text{Average annual cash inflow}} = \frac{\text{Rs. 200 crores}}{\text{Rs. 40 crores}} = 5.000$$

The Present Value annuity factor appearing nearest to 5.092 for 15 years @ 18%

NPV at 18% *(Rs. Crores)*

P.V. of annual cash inflow	(40×5.092)	203.68
Initial cash outlay		200.00
NPV		3.68

NPV at 19% *(Rs. Crores)*

P.V. of annual cash inflow	(40×4.876)	195.04
Initial cash outlay		200.00
NPV		(4.96)

Now, the IRR of the Project is acertained by method of interpolation as follows :

$$\text{IRR} = 18\% + \frac{3.68}{3.68 - (-4.96)} \times 1\% \quad = 18\% + \frac{3.68}{8.64} \times 1\% = 18\% + 0.426\% = 18.43\%$$

Illustration 13 : An oil company proposes to install a pipeline for transport of crude from wells to refinery. Investments and operating costs of the pipeline vary for different sizes of pipelines (diameter). The following details have been conducted :

(a) Pipeline diamter	(in inches)	3	4	5	6	7
(b) Investment required	(Rs. lakhs)	16	24	36	64	150
(c) Gross annual savings in operating costs before depreciation	(Rs. lakhs)	5	8	15	30	50

The estimated life of the installation is 10 years. The oil comapany's tax rate is 50%. There is no salvage value and straight line rate of depreciation is followed.

Calculate the net savings after tax and cash flow generation and recommend therefrom, the largest pipeline to be insalled, if the company desires a 15% post-tax return. Also indicate

which pipeline will have the shortest payback. The annuity P.V. factor at 15% for 10 years is 5.019.

Solution :

Determination of CFAT   *(Rs. Lakhs)*

Pipeline Diameter (inches)	Gross savings p.a.	Savings after tax	Depreciation	Tax adv. of depreciation	Total cost savings/(CFAT)
(1)	(2)	(3) [(2)×50%]	(4)	(5) [(4)×50%]	(6) [(3)×5%]
3	5	2.5	1.6	0.8	3.3
4	8	4.0	2.4	1.2	5.2
5	15	7.5	3.6	1.8	9.3
6	30	15.0	6.4	3.2	18.2
7	50	25.0	15.0	7.5	32.5

Payback Period in Years

Inches	Rs. lakhs	Years
3	16/3.3	4.848
4	24/5.2	4.615
5	36/9.3	3.871
6	64/18.2	3.516
7	150/32.5	4.615

Therefore, Pipeline diameter of 6 inches has shortest payback period.

Determination of NPV   *(Rs. in lakhs)*

Pipeline dia (inches)	CFAT for 10 years	PV factor @ 15% 10 yrs.	Total PV	Cash outflow	NPV
3	3.3	5.019	16.5627	16	0.5627
4	5.2	5.019	26.0988	24	2.0988
5	9.3	5.019	46.6767	36	10.6767
6	18.2	5.019	91.3458	64	27.3458
7	32.5	5.019	163.1175	150	13.1175

Suggestion : Pipeline of 6 inches diameter has highest NPV and it is recommended for installation.

Illustration 14 : Indo Plastics Ltd. is a manufacturer of high quality plastic products. Rasik, President, is considering computerising the company's ordering, inventory and billing procedures. He estimates that the annual savings from computerisation include a reduction of 4 clerical employees with annual salarie sof Rs. 50,000 each, Rs. 30,000 from rudeuced production delays caused by raw materials inventory problems, Rs. 25,000 from lost sales due to inventory stock outs and Rs. 18,000 associated with timely billing procedures.

The purchase price of the system in Rs. 2,50,000 and installation costs are Rs. 50,000. These outlays will be capitalised (depreciated) on a straight line basis to a zero books salvage value

which is also its market value at the end of five years. Operation of the new system requires two computer specialists with annual salaries of Rs. 80,000 per person. Also annual maintenance and operating (cash) expenses of Rs. 22,000 are emstimated to be required. The company's tax rate is 40% and its required rate of return (cost of capital) for this project is 12%

Your are required to—

(i) evaluate the project using NPV method;

(ii) evaluate the project using PI method;

(iii) calculate the Project's payback period.

Note :

(a) Present value of annuity of Re. 1 at 12% rate of discount for 5 years is 3.605.

(b) Present value of Re. 1 at 12% rate of discount, received at the end of 5 years is 0.567.

Solution :

Determination of NPV *(Rs.)*

Cost		2,50,000
Installation expenses		50,000
Total net Cash Outlay		3,00,000

Project's operating and terminal value cash flows over its 5-year life *(Rs.)*

Savings			
Reduction in clerks salaries	(4×50,000)	2,00,000	
Reduction in production delays		30,000	
Reduction in lost sales		25,000	
Gains due to timely billing		18,000	2,73,000
Less : Expenses			
Depreciation	(3,00,000/5)	60,000	
Add : People cost	(80,000×2)	1,60,000	
Maintenance cost		22,000	2,42,000
Profit before Tax			31,000
Less : Tax (40%)			12,400
Profit After Tax			18,600

Cash flow = Profit After Tax – Depreciation = 18,600 + 60,000 = Rs. 78,600
The cash flows is the same for the years 1 to 5.

(i) **Evaluation of the Project by using Net Present Value (NPV) Method :**

Years	Cash flow After tax (Rs.)	PV of Annuity of Rs. 1 at 12% for five years	Total present value (Rs.)
1 to 5	78,600	3.605	2,83,353
Less : Total Initial Cash Outlay			3,00,000
NPV			(16,647)

Since NPV is negative, therefore, the project is unviable.

(ii) **Evaluation of the Project by using PI Method.**

Profitability Index (PI) = PV of cash in flows/Initial outlay

= 2,83,353/3,00,000 = 0.945

Since PI is less than 1.0, the project is unviable.

(iii) **Calculation of the Project's Payback Period** (Rs.)

Year	Net cashflow	Cumulative cashflow
1	78,600	78,600
2	78,600	1,57,200
3	78,600	2,35,800
4	78,600	3,14,400
5	78,600	3,93,00

Hence, the payback period is 3 years *plus* a fraction of the 4th year. The fraction of the year can be calculated as under :

$$\frac{64,200}{78,600} = 0.82$$

Therefore, the payback period is 3.82 years.

CAPITAL RATIONING :

Illustration 15 : In a capital rationing situation (investment limit Rs. 25 lakhs), suggest the most desirable feasible combination on the basis of the following data (indicate justification) :

(Rs. lakhs)

Year	Net cashflow	NPV
A	15	6
B	10	4.5
C	7.5	3.6
D	6	3

Projects B and C are mutually exclusive.

Solution :

Determination of feasible combination in Capital Rotationing Situation (Investment Limit Rs. 25 lakhs)

(Rs. lakhs)

Combination	Total outlay	NPV
A & B	25.00	10.50
A & C	22.50	9.60
A & D	21.00	9.00
B & D	16.00	7.50
C & D	13.50	6.60

Analysis : From the above analysis it is observed that projects A&B combination give highest NPV of Rs. 10.50 lakhs. Therefore by undertaking projects A and D, the wealth maximation is possible.

Illustration 16 : The total available budget for a company is Rs. 20 crores and the total cost of the projects is Rs. 25 crores. The projefts listed below have been ranked in order of profitability. There is possibility of submitting X project where cost is assumed to be Rs. 13 crores and it has the Profitability Index of 140.

Project	Cost (Rs. crores)	Profitability index (P.V. of cash inflow/PV of cash outflows) × 100
A	6	150
B	5	125
C	7	120
D	2	115
E	5	110
	25	

Which projects, including X, should be acquired by the company?

Solution :

N.P.V. of Projects

(Rs. Crores)

Project	Cost	PI	P.V. of cash inflow	NPV
(1)	(2)	(3)	(2)×(3) = (4)	(4) – (2) = (5)
A	6	1.5	9.00	3.00
B	5	1.25	6.25	1.25
C	7	1.20	8.40	1.40
D	2	1.15	2.30	0.30
E	5	1.10	5.50	0.50
X	13	1.40	18.20	5.20

Selection of project based on NPV, subject to the availability of total funds Rs. 20 crores.

(Rs. Crores)

Project	NPV	Project cost
X	5.20	13
A	3.00	6
	8.20	19

The company will maximise its NPV by undertaking X and A, which require total funds of Rs. 19 crores. This option is suggested even though there is no full utilisation of total funds. The surplus funds of Rs. 1 crore can be deployed elsewhere profitably.

The following combination of projects will not maximise NPV :
(Rs. crores)

Project		NPV	Project cost
(i)	X	5.20	13
	B	1.25	5
		6.45	18
(ii)	X	5.20	13
	C	1.40	7
		6.60	20
(iii)	X	5.20	13
	B	1.25	5
	D	0.30	2
		6.75	20

Illustration 17 : S. Ltd., has Rs. 10,00,000 allocated for capital budgeting purpose. The following proposal and associated profitability indexes have been determined :

Project	Cost (Rs.)	Profitability Index
1	3,00,000	1.22
2	1,50,000	0.95
3	3,50,000	1.20
4	4,50,000	1.18
5	2,00,000	1.20
6	4,00,000	1.05

Which of the above investment should be undertaken? Assume that projects are indivisible and there is no alternative use of the money allocated for capital budgeting.

Solution :

Statement Showing Ranking of Projects on the basis of Profitability Index (P.I.)

Project	Cost (Rs.)	P.I.	Rank
1	3,00,000	1.22	1
2	1,50,000	0.95	5
3	3,50,000	1.20	2
4	4,50,000	1.18	3
5	2,00,000	1.20	2
6	4,00,000	1.05	4

Statement showing NPV of Projects   *(Rs.)*

Project	Cost	P. I.	Cash inflow (2) × (3)	NPV (4) – (2)
(1)	(2)	(3)	(4)	(5)
1	3,00,000	1.22	3,66,000	66,000
2	1,50,000	0.95	1,42,500	(7,500)
3	3,50,000	1.20	4,20,000	70,000
4	4,50,000	1.18	5,31,000	81,000
5	2,00,000	1.20	2,40,000	40,000
6	4,00,000	1.05	4,20,000	20,000

Selection Projects

- Profitability Index method : Assuming the projects are indivisible and there is no alternative use of unutilised amount, S. Ltd. is advised to undertake investment in projects 1, 3 and 5, which will give N.P.V. of Rs. 1,76,000 and unutilised amount will be Rs. 1,50,000.

- Net present value method : As per this method projects 3, 4 and 5 can be undertaken which will be Rs. 1,91,000 and no money will remain unspent.

Suggestion : From the above analysis, we can observe that, selection of projects under NPV method will maximise S Ltd.'s net cash inflow by Rs. 15,000 (*i.e.,* 1,91,000 – 1,76,000). Hence, it is suggested to undertake investments in project 3, 4 and 5.

Illustration 18 : Alpha Limited is considering five capital projects for the years 2003 and 2004. The company is financed by equity entirely and its cost of capital is 12%. The expected cash flows of the projects are as belows :

Year end Cash flows *(Rs. '000)*

Project	2003	2004	2005	2006
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 Rs. 1,10,000 in 2003 and with no limitation in subsequent years. For your analysis, use the following present value factors :

Years	2003	2004	2005	2006
Factors	1.00	0.89	0.80	0.71

Solution :

Calculation of NPV and Profitability Index (PI) *(Rs. '000)*

	Discounted cash flows				NPV	PI
Year	*2003*	*2004*	*2005*	*2006*		
Discount Factors @ 12%	*1.00*	*0.89*	*0.80*	*0.71*		
Project						
A	(70)	31.15	28	14,20	3.35	1.048
B	(40)	(26.70)	36	39.05	8.35	1.125
C	(50)	(53.40)	56	56.80	9.40	1.091
D	–	(80.10)	44	46.15	10.05	1.125
E	(60)	17.80	32	25.30	25.30	1.422

Ranking of Projects Based on Profitability Index

Rank	I	II	III	IV	V
Project	E	D	B	C	A

Anlysis and Selection

Conditions

1. Capital available for investment is limited to Rs. 1,10,000 in 2003, with no limitation in subsequent years.

2. All projects are divisible *i.e.*, size of investment can be reduced if necessary in relation to availability of funds.

3. None of the projects can be delayed or undertaken more than once.

Project D's cash outflow will start in the year 2004, and hence this will not form a s constraint in selection of projects. Since there is no scarcity of funds from the year 2004 onwards. This can be taken up in 2004.

Project	Rank	Initial investment (Rs.)
E	I	60,000
B	II	40,000
C	IV	10,000*

* Since the project C is divisible, the balance funds of Rs. 10,000 (*i.e.*, 1,10,000–60,000–40,000) can be allocated to project C. One of the condition in the problem is none of the projects can be undertaken more than once. Hence project C will continue with initial investment of Rs. 10,000. Project D can be undertaken in the year 2004 since there is no scarcity of funds from the year 2004.

Ranking of Projects excluding 'D' which is to start in 2004 when no limitation on capital availability :

Project	E	B	C	A
Rank	I	II	III	IV

Illustration 19 : Five Projects M, N, O, P and Q are available to a company for consideratio. The investment required for each project and the cash flows it yields are tabulated below. Projects N and Q are mutually exclusive. Taking the cost of capital @ 10%, which combination of projects should be taken up for a total capital outlay not exceeding Rs. 3 lakhs on the basis on NPV and Benefit-Cost Ratio (BCR)?

(Rs.)

Project	Investment	Cash flow p.a.	No of years	P.V. @ 10%
M	50,000	18,000	10	6.145
N	1,00,000	50,000	4	3.170
O	1,20,000	30,000	8	5.335
P	1,50,000	40,000	16	7.824
Q	2,00,000	30,000	25	9.077

Solution :

Total Capital outlay < Rs. 3.00 lakhs

Computation of Net Present Value and Benefit-Cost Ratio for 5 Projects   *(Rs.)*

Project	Investment	Cash flow p.a.	No. of years	P.V. @ 10%	P.V.	NPV	BCR (PV/ Investment)
M	50,000	18,000	10	6.145	1,10,610	60,610	2.212
N	1,00,000	50,000	4	3.170	1,58,500	58,500	1.585
O	1,20,000	30,000	8	5.335	1,60,050	40,050	1.334
P	1,50,000	40,000	16	7.824	3,12,960	1,62,960	2.086
Q	2,00,000	30,000	25	9.077	2,72,310	72,310	1.362

Statement showing Feasible Combination of Projects and their NPV, BCR

Feasible Combination of projects	Investment (Rs.)	NPV (Rs.)	Rank	BCR	Rank
(i) M, N and P	3,00,000	2,82,070	1	1.940	1
(ii) M, N and O	2,70,000	1,59,160	4	1.589	4
(iii) O & P	2,70,000	2,03,010	3	1.752	3
(iv) M & Q	2,50,000	1,32,920	5	1.532	5
(v) N & P	2,50,000	2,21,460	2	1.886	2
(vi) N & Q	3,00,000	1,30,810	6	1.436	6

Illustration 20 : C Ltd. is considering its capital investment programme for 2010 and 2011. The company is financed entirely by equity shares and has a cost of capital of 15% per annum. The company have reduced their initial list of projects to five, the expected cash flows of which are as follows :   *(Rs.)*

Project	Cash flows			
	2010	2011	2012	2013
A	−60,000	+30,000	+25,000	+25,000
B	−30,000	−20,000	+25,000	+45,000
C	−40,000	−50,000	+60,000	+70,000
D	0	−80,000	+45,000	+55,000
E	−50,000	+10,000	+30,000	+40,000

None of the above projects can be delayed. All the projects are divisible, outlays may be reduced by any proportion and net inflows will then be reduced in the same proportion. No project can be undertaken more than once. C Ltd. is able to invest surplus funds in a bank deposit account yielding an annual return of 10%. C Ltd. cost of capital is 15%.

Required :

(i) Prepare calculations showing which projects C. Ltd. should undertake, if capital is expected to be available as indefinitely large amounts at 15% per annum during all future periods.

(ii) Show how your answer to *(i)* would vary if capital available for investment was limited to Rs. 1,00,000 in 2011 but was not limited thereafter.

(iii) Provide a mathematical programming formulation which would assist C Ltd. in choosing investment projects if capital available in 2010 is limited to Rs. 1,00,000, capital is available in 2011 is limited to Rs. 90,000, capital available thereafter without limit at 10% per annum, and the shareholders required return from the company was 15% per annum at all relevant times.

Ignore taxation. Present value factors at 15% year 1-0.8696; 2-0.7561; 3-0.6575.

Solution :

(i) Net Present Value Calculations *(Rs.)*

Project A	= (60,000) + 30,000 × .8696 + 25,000 × .7561 + 25,000×.6575 =	1,428
Project B	= (30,000) + (20,000) × .8696 + 25,000 × .7561 + 45,000×.6575 =	1,098
Project C	= (40,000) + (50,000) × .8696 + 60,000 × .7561 + 70,000×.6575 =	7,911
Project D	= + (80,000) × .8696 + 45,000 × .7561 + 55,000×.6575 =	619
Project E	= (50,000) + 10,000 × .8696 + 30,000 × .7561 + 40,000×.6575 =	7,679

Every project should be accepted since each has a positive Net Present Value.

(ii) Preferred Investments.

Project	Rs.	Ranking
D	0	I
C	40,000	II
E	50,000	III
B	10,000	IV
	1,00,000	

Z (in maximise) 1428 A + 1098 B + 7911 C + 619 D + 7679 E – 0.44F

= 60,000 A + 30,000 B + 40,000 C + 50,000 E + F ≤ 1,00,000

= 20,000 B + 50,000 C + 80,000 D   ≤ 1.1F+30,000 A+10,000 E + 90,000

A, B, C, D, E, F

Working : If invested in Bank Deposit, yield @ 10% = 1.1
Cost of capital (if not invested) @ 15% = 1.15
The decision of not investing will yield a loss of revenue.

The revised NPV of revenue from the project will be $= \left(\dfrac{1.1}{1.15} - 1 \right) = .044\,F$

Illustration 21 : A company is considering a cost saving project. This involves purchasing a machine costing Rs. 7,000 which result in annual savings on wage costs of Rs. 1,000 and on material costs of Rs. 400.

The following forcasts are made of the rates of inflation each year for the next 5 years :

Wages costs	10%
Material costs	5%
General prices	6%

The cost of capital of the company, in monetary terms, is 15%.

Evaluate the project, assuming that the machine has a life of 5 years and no scrap value.

Solution :

Calculation of Net Present Value (Rs.)

Year	Labour Cost Saving	Material Cost Saving	Total Savings	DCF @ 15%	Present Values
1	$1000 \times (1.1) = 1,100$	$400 \times (1.05) = 420$	1,520	0.870	1,322
2	$1000 \times (1.1)^2 = 1,210$	$400 \times (1.05)^2 = 441$	1,651	0.756	1,248
3	$1000 \times (1.1)^3 = 1,331$	$400 \times (1.05)^3 = 463$	1,794	0.658	1,180
4	$1000 \times (1.1)^4 = 1,464$	$400 \times (1.05)^4 = 486$	1,950	0.572	1,115
5	$1000 \times (1.1)^5 = 1,610$	$400 \times (1.05)^5 = 510$	2,120	0.497	1,054
Present value of Total Savings					5,919
Less : Initial Cash Outflow					7,000
Net Present Value (Negative)					(1,081)

Analysis : Since the present value of cost of project exceeds the present value of savings it is not suggested to purchase the machine.

Illustration 22 : D Limited, has under reivew a project involving the outlay of Rs. 55,000 and expected to yield the following net cash savings in current terms :

Year	1	2	3	4
Rs.	10,000	20,000	30,000	5,000

The company's cost of capital, incorporating a requirement for growth in dividends to keep pace with cost inflation is 20%, and this is used for the purpose of investment appraisal. On the above basis the divisional manager involved has recommended rejection of the proposal.

Having regard to your own forecast that the rate of inflation is likely to be 15% in year 1 and 10%, in each of the following years, you are asked to comment fully on his recommendation. (Disounting figures at 20% are 0.833, 0.694, 0.579 and 0.482 respectively for year 1 to year 4.)

Solution :

Calculation of Net Present Value (Rs.)

Year	Cash inflows	Discount factor (20%)	Present value
1	10,000	0,833	8,330
2	20,000	0.694	13,880
3	30,000	0.579	17,370
4	5,000	0.482	2,410
P.V. of Cash Inflows			41,990
Less : Initial Investment			55,000
Net Present Value			(13,010)

Analysis : Since NPV is negative it is suggested not to take up the project. Company's cost of capital is fixed at 20% keeping in view the requirement for growth in dividend as well as cost inflation.

Calculation : Net Present Value based on Inflation Adjusted Cash Flow (Rs.)

Year	Cash flow	Inflation adjustmwnt	Inflation adjusted	DCF @ 20%	Present value of cash flow
1	10,000	1.15	11,500	0.833	9,580
2	20,000	1.15×1.10	25,300	0.694	17,558
3	30,000	1.15×1.10²	41,745	0.579	24,170
4	5,000	1.15×1.10³	7,653	0.482	3,689
Present Value of Inflation Adjusted Cash Inflows					54,997
Less : Initial Investment					55,000
Net Present Value					(–) 3

Analysis : The negative NPV is due to rounding of, otherwise it would be zero. Hence, it is indifferent to suggest or reject the proposal.

Illustration 23 : A company is considering a new project. The project would involve an intitial investment of Rs. 1,20,000 in equipment which would have a life of 5 years and no scrap value. The selling price now (year 0) would be Rs. 60 and is expected to increase in line with the retail price index. Sales are expected to be constant at 2000 units each year. The following estimates about unit costs are available :

Cost element	Cost at year 0 prices Rs.	Rate of increase
Wages	20	2% per annum faster than retail prices
Other	25	In line with retail prices
Total	45	

All transactions take place at yearly intervals on the last day of the year. No increase in working capital will be required. The following estimates of the rate of increase in retail prices and of interest rates are available :

Year	Rates of increase in retail prices %	Interest rate %
1	15	16
2	20	20
3	25	22
4	40	20
5	30	18

Assuming Purchasing Power Parity Theorem hold in the present case, changes in interest rates will affect the money value. Hence Cost of Capital is taken in money terms.

Solution :

Year	0	1	2	3	4	5
Inflation rate for contribution before wages (interest over previous year)		1.15	1.20	1.25	1.40	1.30
Inflation rate for wages (interest over previous year)		1.17	1.22	1.27	1.42	1.32
Contribuion before wages, per unit sold	Rs. 35	Rs. 40.25	Rs. *48.30	Rs. 60.38	Rs. 84.53	Rs. 109.88
Wages per unit	20	23.40	28.55	**36.26	51.49	67.97
Contribution after wages, per unit sold	15	16.85	19.75	24.12	33.04	41.91
Total contribution from 2000 units sold	30,000	33,700	39,500	48,240	66,080	83,820

* 35×1.15×1.20; similarly other figures in this row.

** 20×1.17×1.22×1.27; similarly, other figures in this row.

Calculation of Net Present Value using Money Estimates *(Rs.)*

Year	Money cash flow	Money discount factor		Present value
0	(1,20,000)	1.000		(1,20,000)
1	33,700	0.862	[1×1/1.16]	29,049
2	39,500	0.718	[0.862×1/1.2]	28,361
3	48,240	0.589	[0.718×1/1.22]	28,413
4	66,080	0.491	[0.589×1/1.2]	32,445
5	83,820	0.416	[0.491×1/1.18]	34,869
			NPV -	33,137

Analysis : Since the NPV is Positive, the project is worthwhile.

Illustration 24 : E. Ltd. is considering the replacement of a machine used exclusively for the manufacture of one of its Product Y. The existing machine have a book value of Rs. 65,000 after deducting straight line depreciation from historical costs. However, it could be sold only for Rs. 45,000. The new machine would cost Rs. 1,00,000. E. Ltd. expects to sell Product Y for four more years. The existing machine could be kept in operation for that period of time if it were economically desirable to do so. After four years, the scrap value of both the existing machine and the new machine would be zero.

The current costs per unit for manufacturing Y on the existing machine and on a new machine are as follows :

(Rs.)

	Existing Machine			New Machine
Materials		22.00		20.00
Labour	(32 hours @ Rs. 1.25)	40.00	(16 hours @ Rs. 1.25)	20.00
Overheads	(32 hours @ Rs. 0.60)	19.20	(16 hours @ Rs. 1.80)	28.80
Total cost		81.20		68.80

Overheads are allocated to products on the labour hour rate method. The hourly rates of 0.60 and 1.80 comprise 0.25 and 0.625 for variable overheads and 0.35 and Rs. 1.175 for fixed overheads, including dereciation.

Current sales of Y are 1000 units per annum at Rs. 90 each, if the new machine were purchased, output would be increased to 1200 units and selling price would be reduced to Rs. 80.

E. Ltd. requires a minimum rate of return on investment of 20 per cent per annum in money terms. Material cost, overheads and selling pices are expected to increase at the rate of 15% per annum, in line with the index of retail prices. Labout costs are expected to increase at the rate of 20% per annum.

You are required to :—

(i) Give calculations to show whether purchase of the new machine would be worthwise.

(ii) Comment on the treatment of inflation and the estimation of 20% money cost of capital.

Solution :

(i) Cost of replacement   = 1,00,000 – 45,000 = Rs. 55,000

Manufacturing cost

Fixed items, including depreciation, should be disregarded on the assumption :

(a) Fixed costs do not change as a result of the new machine.

(b) Additional 200 units of extra production would be sold.

(c) All variable elements in the costs given represent cash flows (*i.e.,* labour, material and vaiable overhead).

Operating cash flow Comparison   *(Rs.)*

Particulars	New Machine (1200 units)		Existing Machine (1000 units)		Increamental
	P.U.	*Total*	*P.U.*	*Total*	*Cash flow*
Sales	80	96,000	90	90,000	6,000
Materials	20	24,000	22	22,000	(2,000)
Labour	20	24,000	40	40,000	16,000
Overheads	10	12,000	8	8,000	(4,000)
Net cash flows		36,000		20,000	16,000

Operating savings are Rs. 16,000 p.a. in fabour of new machine.

Notes :

a. Current prices are assumed in the above table *i.e.,* prices at time 0.

b. Time increase in revenue from new machine Rs. 6,000 is exactly offset by the increases in materials and variable overheads *i.e.* Rs. 6,000. Revenue, materials and variable overheads are stated to be subject to the same rate of inflation *i.e.* 15% and therefore will continue to increase at the same rate.

c. The net savings of Rs. 16,000 represent the saving on labour costs which is expected to increase @ 20% p.a.

Operating cash flow Comparison *(Rs.)*

Year	Cash Flows	Discount factor @ 20%	PV
0	(55,000)	1.000	(55,000)
1	*19,200	0.833	15,994
2	23,040	0.694	15,990
3	27,648	0.579	16,008
4	33,178	0.482	15,992
Net Present Value			8,984

* 1,600×12

Saving is compounded @ 20% p.a. inflation rate, discounted at 20% money cost of capital, will be Rs. 16,000 p.a.

For 4 years Rs. 16,000×4 = Rs. 64,000.

NPV Rs. 64,000 – Rs. 55,000 = Rs. 9,000.

The above result is due to approximation.

(ii) The relationship between money cost of capial and real cost of capial is givne by—

$$(1+m) = (1-r)(1+i)$$ Where, m = money cost of capital

r = real cost of capital

i = is the inflation rate

Hence, 1 + 0.20 = (1+r) (1+0.15)

Hence, r = 4.3%

Analysis : Real cost of capital consists of time value of money return required on a relatively risk less security in a non-inflationary situation and the risk premium to compensate investors for the uncertainity associated with the investment in the said security 4.3% ia a very low figure and therefore when inflation is @ 15% p.a., money cost of capital should much higher than 20%. This project might have been rejected if money cost of capital is calculated correctly.

Illustration 25 : A Company is reviewing an investment proposal in a project involving a capital outlay of Rs. 90,00,000 in plant and machinery. The project would have a life of 5 years at the end of which the plant and machinery could reach a resale value of Rs. 30,00,000. Further the project would also need a working capital of Rs. 12,50,000 which would be built during the year 1 and to be released from the project at the end of year 5. The project is expected to yield the following cash profits :

Year	Cash profit (Rs.)
1	35,00,000
2	30,00,000
3	25,00,000
4	20,00,000
5	20,00,000

A 25% depreciation for plant and machinery is available on WDV basis as Income-tax exemption. Assume that the Corporate Tax is paid one year in arrear of the periods to which it relates and the first year's depreciation allowance would be claimed against the profits of year 1.

The Assistant Management Accountant has calculated NPV of the project using the company's corporate target of 20% pre-tax rate of return and has ignored the taxation effect in the cash flows.

As the newly recruited Management Accountant, you realise that the project's cash flows should incorporate the effects of tax. The Corporate Tax is expected to be 35% during the life of the project and thus the company's rate of return post-tax is 13% (65% of 20%).

Your Assistant is surprised to note the difference between discounting the pre-tax cash flows at a pre-tax DCF rate and post-tax cash flows at a post-tax rate.

Required :

    a. Calculate the NPV of the project as the Assistant Management Accountant would have calculated it ;

    b. Re-calculate the NPV of the project taking tax into consideration;

    c. Comment on the desirability of the project *vis-a-vis* your findings in (b).

Solution :

a. Assistant Management Accountant's Calculation (*i.e.*, Ignoring taxation)

Year	Investment		Cash Profit	Net Cashflows	Discount factor at 20%	Present value
	Plant and Machinery	Working Capital				
0	(90.0)	–	–	(90.0)	1.00	(90,000)
1	–	(12.5)	35.0	22.5	0.83	18,675
2	–		30.0	30.0	0.69	20,700
3	–		25.0	25.0	0.58	14,500
4	–		20.0	20.0	0.48	9,600
5	30.0	12.5	20.0	62.5	0.40	25,000
					NPV	(1,525)

It is assumed that working capital (debtors, stocks etc.) reduce cashflows in year 1 and would be recovered soon after the end of year 5. The working capital cashflows are therefore assigned to years 1 and 5.

Here it is observed that NPV is negative and hence, the Assistant Management Accountant would have concluded that the project should be rejected.

(b) Allowing for taxation :

(i) Tax on Cash Profit *(Rs.)*

Year	Cash Profit	Tax 35%	Year of Tax Payment
1	35	12.25	2
2	30	10.50	3
3	25	8.75	4
4	20	7.00	5
5	20	7.00	6

Year	Reducing Balance	Depreciation	Tax Rebate (Tax payable)	Year of cashflow
0	90,000	–	–	–
1	67,500	22,500	7,875	2
2	50,625	16,875	5,906	3
3	37,969	12,656	4,430	4
4	28,476	9,492	3,322	5
5	21,357	7,119	2,492	6
*Profit on sale of Plant & Machinery (30,000 – 21,357)	(8,643)*	(3,025)	6

Calculation of NPV of the Project : *(Rs.)*

Year	Investment		Deprn. Allow. Tax	Cash Profits	Tax on Profits	Net Cashflow at 13%	Disc. factor	Present Value
	Plant & Machinery	Working Capital saved						
0	(90,000)	–	–	–	–	(90,000)	1.00	(90,000)
1	–	(12,500)	–	35,000	–	22,500	0.88	19,800
2	–	–	7,875	30,000	(12,250)	25,625	0.78	19,988
3	–	–	5,906	25,000	(10,500)	20,406	0.69	14,080
4	–	–	4,430	20,000	(8,750)	15,680	0.61	9,565
5	30,000	12,500	3,322	20,000	(7,000)	58,822	0.54	31,764
6	–	–	(0.533)	–	(7,000)	(7,533)	0.48	(3,616)
							NPV	+ 1,581

(c) The NPV is positive, although it is very samll in relation to the Capital outlay of Rs. 90 lakhs. It is also apparent the positive NPV depends heavily on the assumption that the plant and machinery would have a resale value of Rs. 30 lakhs at the end of year 5. Such projects which rely on their residual values for their positive NPV should normally be regarded high-risk venture. It can be further seen that a drop of around 10% *i.e.*, Rs. 3 lakhs in resale value would make the project negative.

Illustration 26 : SCL Limited, a highly profitable company, is engaged in the manufacture of power intensive products. As part of its diversification plans, the company proposes to put up a Windmill to generate electricity. The details of the scheme are as follows :

(1)	Cost of the Windmill	— Rs. 300 lakhs
(2)	Cost of Land	— Rs. 15 lakhs
(3)	Subsidy from State Govenment to be received at the end of first year of installation	— Rs. 15 lakhs

(4) Cost of electricity will be Rs. 2.25 per unit in year 1. This will increase by Rs. 0.25 per unit every year till year 7.

    After that it wil increase by Rs. 0.50 per unit.

(5) Maintenance cost will be Rs. 4 lakhs in year 1 and the same will increase by Rs. 2 lakhs every year.

(6) Estimated life 10 years.

(7) Cost of capital 15%.

(8) Residual value of Windmill will be *nil*. However land value will go up to Rs. 60 lakhs, at the end of year 10.

(9) Depreciation will be 100% of the cost of the Windmill in year 1 and the same will be allolwed for tax purposes.

(10) As Windmills are expected to work based on wind velocity, the efficiency is expected to be an average 30%. Gross electricity generates at this level will be 25 lakh units per annum. 4% of this electricity generated will be committed free to the State Electriciy Board as per the agreement.

(11) Tax rate 50%.

From the above information you are required to :

    (a) Calculate the net present value. [Ignor tax on capital profits.]

    (b) List down two non-financial factors that should be considered before taking a decision.

For your exercise use the following discount factors.

Year	1	2	3	4	5	6	7	8	9	10
Discoun Factors	0.87	0.76	0.66	0.57	0.50	0.43	0.38	0.33	0.28	0.25

Solution :

Working Notes :

1. Initial Investment *(Rs. lakhs)*

Cost of Land	15
Cost of Windmills	300
Total	315

2. Net units generated *(No. of units)*

Gross units genered	25 lakhs
Less : 4% Free Supply to SEB	1 lakh
Net Units sold	24 lakhs

3. Cost per unit Rs. 2.25 per unit in year 1. It will increase by Rs. 0.25 per unit every year till year 7. After that it will increase by Rs. 0.50 per unit. Maintenance Cost will be Rs. 4 lakhs in year 1 and the same will increase by Rs. 2 lakhs every year.

Calculation of Net Present Value   *(Rs. lakhs)*

Year	1	2	3	4	5	6	7	8	9	10
Unit Cost (Rs.)	2.25	2.50	2.75	3.00	3.25	3.50	3.75	4.25	4.75	5.25
Savings (24 lakh unit×unit cost)	54	60	66	72	78	84	90	102	114	126
Maintenance Cost	4	6	8	10	12	14	16	18	20	22
Gross Savings	50	54	58	62	66	70	74	84	94	104
Less : Tax @ 50%	25	27	29	31	33	35	37	42	47	52
Savings after Tax	25	27	29	31	33	35	37	42	47	52
Add : Tax saving on depreciation	150	–	–	–	–	–	–	–	–	–
Subsidy	15	–	–	–	–	–	–	–	–	–
Net savings	190	27	29	31	33	35	37	42	47	52
Discount Factor 15%	0.87	0.76	0.66	0.57	0.50	0.43	0.38	0.33	0.28	0.25
Present Value	165.30	20.52	19.14	17.67	16.50	15.05	14.06	13.86	13.16	13.00

(Rs. lakhs)

Total Present Value	308.26
Add : Present value of Land (Rs. 60 lakhs ×0.25)	15.00
	323.26
Less : Initial Cost	315.00
Net Present Value	8.26

(b) **Non-financial Factor :** The follwoing non-financial factors may be taken into consideration while taking the investment decision.

- Cost of purchase of electricity from State Electricity Board.
- Machinery and skilled manpower availability.
- Wind velocity in the proposed project area.
- Risk coverage.
- Technology availability.
- Authorisation in the Memorandum of Association to take the business etc.

Illustration 27 : TSL Ltd., a highly profitable and tax paying company is planning to expand its present capacity by 100%. The estimated cost of the project is Rs. 1,000 lakhs out of which Rs. 500 lakhs is to be met out of loan funds. The company has received two offers from their bankers :

	Option 1	Option 2
Value of loan	Rs. 500 lakhs	US $ 14 lakhs equal to Rs. 500 lakhs
Interest	15% payable yearly	6% payable (fixed) yearly in US $
Period of Repayment	5 years (In 5 instalment is payable after draw down)	5 years
Other expenses (to be treated as revenue expenditure)	1% of the value of the loan	1% at US $ = Rs. 36 (Average)
Future exchange rate	—	End of 1 year 1US $ = Rs. 38 thereafter to incease by Rs. 2 per annum

The company is liable to pay income-tax at 35% and eligible for 25% depreciation on W.D. value. You may assume that at the end of 5th year the company will be able to claim balance in WDV for tax purposes. The company follows Accounting Standard AS-11 for accounting changes in Foreign Exchange Rate.

(1) Compare the total outflow of cash under the above options.

(2) Using discounted cash flow technique, evaluate the above offers.

(3) Is there any risk, which the company should take care of?

(4) In case TSL has large volume of exports would your advice be different. The following discounting table may be adopted :

Year	0	1	2	3	4	5
Discount Factor	1	0.921	0.848	0.781	0.720	0.663

Solution :

Option I

Years	Repayment of Principal	Interest at 15%	Other Expenses	Tax saving	Net Outflow
0	–	–	5.00	1.75	3.25
1	100	75	–	26.25	148.75
2	100	60	–	21.00	139.00
3	100	45	–	15.75	129.25
4	100	30	–	10.50	119.50
5	100	15	–	5.25	109.75
Total Outflows	500	+225	+5.00	–80.50	649.50

Option II

Exch-ange rate	Year	Repay-ment of pricipal	Inter-est	Other charges	Total Amt.	Repay-ment of principal	Balance being premium	Interest	Other charges	Total payment	Tax savings	Net Out-flow
		US$	US$	US$	US$	Rs. (lakhs)	Rs. (lakhs)	Rs. (lakhs)	Rs. (lakhs)	Rs. (lakhs)	Rs. (lakhs)	(Rs. in lakhs)
36	0	–	–	0.140	0.140	–	–	–	5.04	5.04	1.764	3.276
38	1	2.8	0.840	–	3.640	100.00	6.4	31.920		138.32	11.732	126.588
40	2	2.8	0.672	–	3.472	100.00	12.0	26.880		138.88	10.878	128.002
42	3	2.8	0.504	–	3.304	100.00	17.6	21.168		138.768	10.048	128.720
44	4	2.8	0.336	–	3.136	100.00	23.2	14.784		137.984	9.184	128.800
46	5	2.8	0.168	–	2.968	100.00	28.8	7.728		136.528	24.814	111.714
		14.0	2.520	0.140	16.660	500.00	88.0	102.48	5.04	695.520	68.420	627.100

As per AS-11, the premium paid on exchange rate difference, on loans acquired for the purpose of capital expenditure should be capitalised. The same is applicable under the Indian Income-tax Act for tax calculations also.

Tax Savings on Premium Capitalisation   (Rs.)

Year	Opening Value	Premium	Total	Depreciation on premium at 25%	Tax Saving at 35%	Closing WDV
1	–	6.40	6.40	1.60	0.56	4.80
2	4.80	12.00	16.80	4.20	1.47	12.60
3	12.60	17.60	30.20	7.55	2.64	22.65
4	22.65	23.20	45.85	11.46	4.01	34.39
5	34.39	28.80	63.19*	63.19	22.11	Nil

*Assumed that full benefit will be claimed for tax purposes.

Tax Saving on Interest, Other Charges and Premium   (Rs. lakhs)

Year	Amount ot Interest & other charges	Tax savings	Tax saving on premium	Total Tax savings
0	5.040	1.764	—	1.764
1	31.920	11.172	0.560	11.732
2	26.880	9.408	1.470	10.878
3	21.168	7.408	2.640	10.048
4	14.784	5.174	4.010	9.184
5	7.728	2.704	22.110	24.814

(2) Discount Cash Flow : Option I

Year	Net Out flow	Discounting factor	Discounted value
0	3.250	1.000	3.25
1	148.750	0.921	136.99
2	139.000	0.848	117.87
3	129.250	0.781	100.94
4	119.500	0.720	86.04
5	109.750	0.663	72.76
			517.85

Discount Cash Flow : Option II   *(Rs. lakhs)*

Year	Gross outflow	Total tax saving	Net outflow	Discounting factor	Discounted value
0	5.040	1.764	3.276	1.000	3.276
1	138.320	11.732	126.588	0.921	116.587
2	138.880	10.878	128.002	0.848	108.545
3	138.768	10.048	128.720	0.781	100.530
4	137.984	9.184	128.800	0.720	92.736
5	136.528	24.814	111.714	0.663	74.066
					495.740

(3) The discounted value of Option II seems to be better than Option I. However the company has to be careful about future exchange rate. The rate indicated is more by rule of thumb than based on any scientific approach. The company should cover the foreign exchange rate and then work out the value.

(4) In case the company has good volume of exports,then it may help the company to hedge the future payments with outflow. In that case the company may take a lenient view of the possible exchange risk.

Illustration 28 : A large profit making company is considering the installation of a machine to process the waste produced by one of its existing manufacturing process to be converted into a marketable product. At present, the waste is removed by a contractor for disposal on payment by the company of Rs. 50 lakhs per annum for the next four years. The contract can be terminated upon installation of the aforesaid machine on payment of compensation of Rs. 30 lakhs before the processing operation starts. This compensation is not allowed for deduction of tax pruposes.

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

(Rs. Lakhs)

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

Initial stock of materials required before commencement of the processing operations is Rs. 20 lakhs at the start of year 1. The stock levels of materials to be maintained at the end of year 1, 2 and 3 will be Rs. 55 lakhs and the stocks at the end of year 4 will be *nil*. The store of materials will utilise space which would otherwise have been rented out for Rs. 10 lakhs per annum. Labour costs include wages of 40 workers, whose transfer to this process will reduce idle time payments of Rs. 15 lakhs in year 1 and Rs. 10 lakhs in year 2. Factory overheads include apportionment of general factory overheads except to the extent of insurance charges of Rs. 30 lakhs per annum payable on this venture. The company's tax rate is 50%.

Present value factors for four years are as under :

Year	1	2	3	4
Present value factors	0.870	0.756	0.658	0.572

Advice the management on the desirability of installing the machine for processing the waste. All calculations should form part of the answer.

Solution :

Statement of Incremental profit   *(Rs. lakhs)*

Particulars		Year			
		1	2	3	4
Sales	(A)	322	322	418	418
Costs					
Material		30	40	85	85
Wages		60	65	85	100
Other Expenses		40	45	54	70
Factory Overheads (Insurance)		30	30	30	30
Loss of Rent		10	10	10	10
Interest		32	24	16	8
Depreciation (as per IT Act)		50	38	28	21
	(B)	252	252	308	324
Incremental profit	(A) - (B)	70	70	110	94
Tax @ 50%		35	35	55	47

Statement of Incremental profit   *(Rs. lakhs)*

Particulars	Year				
	0	*1*	*2*	*3*	*4*
Stocks of Materials Incresae	(20)	(35)	–	–	–
Compensation for Contract	(30)	–	–	–	–
Saving of Contract Payment	–	50	50	50	50
Tax on Contract Payment	–	(25)	(25)	(25)	(25)
Incremental Profit	–	70	70	110	94
Tax on Incremental Profit	–	(35)	(35)	(55)	(47)
Depreciation added back	–	50	38	28	21
Loan Repayment	–	(50)	(50)	(50)	(50)
Profit on sale of Machinery	–	–	–	–	5
Total Incremental Cash flows	(50)	25	48	58	48
P.V. Factor @	1.00	0.870	0.756	0.658	0.572
NPV of Cash flows	(50)	21.75	36.288	38.164	27.456

Net Present Value = Rs. 73.66 lakhs.

Analysis : Since the NPV of Cash flows of proposal to install a machine to process the waste into marketable product is positive, the proposal can be accepted.

Assumptions : The following assumptions were considered while computation of NPV of the proposal :

–   Material stock increase will lead to cash outflow.
–   Idle-time wages are also taken into consideration while calculation of wages.
–   Insurance charges are only taken as relevant for Computation of cashflow.
–   Interest is calculated at 16% p.a. based on diminishing balance. The repayment of loan is in 4 equal instalments.
–   Capital gains tax ignored on profit on sale of machinery.
–   Saving in contract payment and income-tax thereon considered in computation of cash flows.

Illustration 29 : A company produces main product 'Super' and a co-product 'Mild' . The main product is sold entirely to its collaborator, but the product 'Mild' is sold at the local market. The company increased its capacity as a reslut of which the output of 'Mild' increased to 15,000 m/t per annum at a price Rs. 1,000 per m.t.

However, in the face of increased competition to sell the entire output of 15,000 m/t of 'Mild' the company will have to reduce the sale price by Rs. 50 per m.t. every year for next 5 years and hereafter the price will stabilise at Rs. 750 per m.t.

As an alternative, the company can convert 'Mild' into 'Medium' at a variable cost of Rs. 200 per (metric) tonne. However to enter the market the sale price will have to be Rs. 1,200 per m.t. in the first year and Rs. 1,300 per m.t. in the second year and so on.

Financial Management Decisions

The sale of Medium will be 1,000 m/t in the first year and there upon going up by 1,000 m/t each year. The company will have to invest Rs. 30 lakhs in capital outlay to produce 'Medium'. You are required to present the projected sales volume (quantity and value) of products 'Mild' and 'Medium' and also appraise the investment of Rs. 30 lakhs at 12% per annum for the period of next 5 years.

Present value of Rupee one at 12% p.a.

Year	1	2	3	4	5
Discount factor	0.89	0.79	0.71	0.64	0.57

Solution :

Alternative I

Present Value of Sales of Mild Product *(Rs. Lakhs)*

Year	Quantity M.T.	Price Per M.T Rs.	Sales	DCF @ 12%	Present value
1	15,000	950	142.5	0.89	126.83
2	15,000	900	135.0	0.79	106.65
3	15,000	850	127.5	0.71	90.52
4	15,000	800	120.0	0.64	76.80
5	15,000	750	112.5	0.57	64.13

Total Present Value of Net Sales — 464.93

Calculation of NPV :

Total present values of net sales	464.93
Less : Initial investment	30.00
Net Present Value of Alternative I	434.93

Alternative II *(Rs. lakhs)*

Year	Quantity M.T.	Contribution Per M.T.	Net Sales	DCF @ 12%	Present value
1	1,000	1,000	10.00	0.89	8.90
2	2,000	1,100	22.00	0.79	17.38
3	3,000	1,200	36.00	0.71	25.56
4	4,000	1,300	52.00	0.64	33.28
5	5,000	1,400	70.00	0.57	39.90

Total Present Value of Net Sales — 125.02

Present Value of Sales of Mild

Year	Quantity M.T.	Price Per M.T. Rs.	Sales	DCF @ 12%	Present value
1	14,000	950	133.00	0.89	118.37
2	13,000	900	117.00	0.79	92.43
3	12,000	850	102.00	0.71	72.42
4	11,000	800	88.00	0.64	56.32
5	10,000	750	75.00	0.57	42.75

Total Present Value of Sales — 382.29

Calculation of NPV :

(Rs. lakhs)

P.V of Sales of medium	125.02
P.V. of sales of mild	382.29
Total present value	507.31
Less : Initial investment	30.00
Net Present Value of Alternative II	477.31

Analysis : Since NPV is higher for alternative II, it is suggested to select Alternative II.

Illustration 30 : B Ltd. is considering whether to set up a division in order to manufacture a new Product A. The following statement has been prepared, showing the projected profitability per unit of the new product :

(Rs.)

Selling price			22.00
Less : Direct labout	(2 hours @ Rs. 2.50 per hour)	5.00	
Material	(3 kg. @ Rs. 1.50 per kg.)	4.50	
Overheads		11.50	21.00
Net profit per unit			1.00

A feasibility study, recently undertaken at a cost of Rs. 50,000, suggests that a selling price of Rs. 22 per unit should be set. At this price, it is expected that 10,000 units of A would be sold each year. Demand for A is expected to cease after 5 years. Direct Labour and Material Costs would be incurred only for the duration of the product life.

Overhead per unit have been calculated as follows :   *(Rs.)*

Variable overheads		2.50
Rent	(Note 1 : Rs. 8,000/10,000 units)	0.80
Manager's salary	(Note 2 : Rs. 7,000/10,000 units)	0.70
Depreciation	(Note 3 : Rs. 50,000/10,000 units)	5.00
Head office costs	(Note 4 : 2 hours @ Rs. 1.25 per hour)	2.50
		11.50

Notes :

1. Product A would be manufactured in a factory rented specially for the purpose. Annual rental would be Rs. 8,000 payable only for as long as the factory was occupied.

2. A manager would be employed to supervise production of Product A, at a salary of Rs. 7,000 p.a. The Manager is at present employed by B Ltd. but is due to retire in the near future on an annual pension of Rs. 2,000, payable by the company. If he continued to be employed, his pension would not be paid during the period of his employement. His subsequent pension rights would not be affected.

3. Manufacturing of the Product A would required a specialised machine costing Rs. 2,50,000. The machine would be capable of producing Product A for an indefinite

period, although due to its specialised nature, it would not have any resale or scrap value when the producion of Product A ceased. It is the policy of B Ltd. to provide depreciation on all fixed asset using Straight Line Method. The annual charge of Rs. 50,000 for the new machine is based on a life of five years, equal to the period which Product A to the company to be produced.

4. B Ltd. allocates its head office fixed costs to all products at the rate of Rs. 1.25 per direct labour hour. Total head office fixed costs would not be affected by the introduction of the Product A to the company's range of products.

The Cost of capital of B Ltd. is estimated at 5% p.a. in real terms and you may assume that all costs and prices given above will reamin constant in real terms. All cash flows would arise at the end of each year, with the exception of the cost of the machine which would be payable immediately.

The Management of B Ltd. is very confident about the accuracy of all the estimates given above, with the exception of those relating to product life, the annual sales volume and material cost per unit of Product A.

You are required to :

(i) Decide whether B Ltd. should proceed with manufacture of the Product A.

(ii) Prepare a statement showing how sensitive the NPV of manufacturing Product A is to errors of estimation in each of the three factors : Product life. Annual sales volume and material cost per unit of Product A.

Ignore taxation.

The Present Value of annuity for 3 years, 4 years and 5 years at 5% respectively are 2.72, 3.55 and 4.33.

Solution :

Working Notes :

1. Cost of Machine at 0 years = Rs. 2,50,000

2. Variable Production Cost per annum *(Rs.)*

Material cost P.U.		4.50
Direct Labour cost P.U.		5.00
Variable overheads P.U.		2.50
		12.00
Total Cost Per annum	(10,000 units × Rs. 12)	1,20,000

3. Salary Cost per annum *(Rs.)*

Salary payable p.a.	7,000
Less : Pension not payable	2,000
Net salary payable	5,000

4. Depreciation is a non-cash item, need not be considered in computation of cash flow.

5. Head office cost is committed cost and is irrelevant for decision making.

Calculation of N.P.V.   *(Rs.)*

Sales p.a.		2,20,000
Less : Variable production cost p.a.	1,20,000	
Manager salary p.a.	5,000	
Factory Rent p.a.	8,000	1,33,000
Cash inflow p.a.		87,000
Present value of cash inflows for 1 to 5 years		
Discount factor @ 5%	(87,000×4.33)	3,76,710
Less : Cost of machine		2,50,000
Net present value		1,26,710

Since, Net Present Value is positive, it is suggested to manufacture Product A.

(ii) Sensitive of Forecast Errors :

a. Product Life	3.2 years	36% lower limit of error
b. Annual Sales Volume	7074 units	29% lower limit
c. Material Cost	Rs. 7,426	65% upper limit

Illustration 31 : ABC Company Ltd. has been producing a chemical product by using Machine Z for the last two years. Now the management of the company is thinking to replace this Machine either by X or by Y Machine. The following details are furnished to you :

(Rs.)

Machine	Z	X	Y
Book value	1,00,000	–	–
Resale value now	1,10,000	–	–
Purchase price	–	1,80,000	2,00,000
Annual Fixed Cost (including depreciation)	92,000	1,08,000	1,32,000
Variable running costs (including labour) per unit	3	1.50	2.50
Production per hour (units)	8	8	12

You are also provided with the following details :

Selling price per unit	Rs. 20
Cost of materials per unit	Rs. 10
Annual operating hours	2,000
Working life of each of the three machines (as from now)	5 years

Salvage value of Machines Z - Rs. 10,000; X - Rs. 15,000; Y - Rs. 18,000.

The company charges depreciaion using straight line method. It is anticipated that an additional cost of Rs. 8,000 per annum would be incurred on special advertising to sell the extra output of Machine Y. Assume tax rate of 50% and cost of capital 10%. The present value of Re. 1 to be received at the end of the year at 10% is as under.

Year		1	2	3	4	5
Present Value		.909	.826	.751	.683	.621

Using NPV method, you are required to analysis the feasibility of the proposal and make recommendations.

Solution :

Statement Showing Computation of Annual Cash Inflow of Three Machines

		Machines		
		Z	X	Y
Sales (Units)		16,000	16,000	24,000
Sales @ Rs. 20 P.U.	(A)	3,20,000	3,20,000	4,80,000
Costs :				
Variable Running Cost		48,000	24,000	60,000
Material Cost		1,60,000	1,60,000	2,40,000
Fixed Cost		92,000	1,08,000	1,32,000
Special Advertising		–	–	8,000
	(B)	3,00,000	2,92,000	4,40,000
PBT	(A) – (B)	20,000	28,000	40,000
Less : Tax @ 50%		10,000	14,000	20,000
PAT		10,000	14,000	20,000
Add : Depreciation		20,000	33,000	36,400
Annual Cash Inflow		30,000	47,000	56,400

Computation of Net Present Value

Year	Discounting factors @10%	Machines					
		Z		X		Y	
		Cash flow	P.V.	Cash flow	P.V.	Cash flow	P.V.
0	1.000	(1,10,000)	(1,10,000)	(1,80,000)	(1,80,000)	(2,00,000)	(2,00,000)
1	0.909	30,000	27,270	47,000	42,723	56,400	51,268
2	0.826	30,000	24,780	47,000	38,822	56,400	46,586
3	0.751	30,000	22,530	47,000	35,297	56,400	42,356
4	0.683	30,000	20,490	47,000	32,101	56,400	38,521
5	0.621	30,000	18,630	47,000	29,187	56,400	35,025
5*	0.621	10,000	6,210	15,000	9,315	18,000	11,178
Net present value			9,910		7,445		24,934

*Salvage value at the end of 5th year.

$$\text{Calculation of Profitability Index (PI)} = \frac{\text{P.V. Cash inflows}}{\text{P.V. Cash outflows}}$$

$$\text{Machine Z} = \frac{1,19,910}{1,10,000} = 1.09 \quad \text{Machine X} = \frac{1,87,445}{1,80,000} = 1.041 \quad \text{Machine Y} = \frac{2,24,934}{2,00,000} = 1.12$$

Analysis : Based on NPV method, Machine Y is to be selected, since its NPV is highest at Rs. 24,934. But the initial investmnt of three machines is different, NPV method is not appropriate. Profitability Index Method is most suitable for evaluation. The Profitability Index of Machine Y is highest and hence Machine Z is to be replaced with Machine Y.

Illustration 32 : The Super Specialists Ltd. constructs customized parts for satellites to be launched by USA and China. The parts are constructed in eight locations (including the central head quarters) around the world. The Finance Director, Ms. Kamni, chooses to implement video conferencing to speed up the budget process and save travel costs. She finds that, in earlier years, the company sent two officers from each location to the central headquarters to discuss the budget twice a year. The average travel cost per perosn, including air fare, hotels and meals, is Rs. 18,000 per trip. The cost of using video conferencing is Rs. 550,000 to set up a system at each location *plus* Rs. 300 per hour average cost of telephone time to transmit signals. A total 32 hours of transmission time will be needed to complete the budget each year. The company depreciates this type of equipment over five years by using straight line method. An alternative approach is to travel to local rented video conferencing facilities, which can be rented for Rs. 1,500 per hour *plus* Rs. 400 per hour averge cost for telephone charges.

You are Senior Officer of Finance Department. You have been asked by Ms. Kamni to evaluate the proposal and suggest if it would be worthwhile for the company to implement video conferencing.

Solution :

Option I : Cost of travel, in case Video Conferencing facility is not provided *(Rs.)*

Total Trip = No. of Locations × No. of Persons × No. of Trips per Person

7×2×2 = 28 Trips

Total Travel Cost (including air fare, hotel accommodation and meals)

(28 trips × Rs. 18,000 per trip)   5,04,000

Option II : Video Conferencing Facility is provided by Installation of Own Equipment at Different Locations *(Rs.)*

Cost of Equipment at each location	(Rs. 5,50,000×8 locations)	44,00,000
Economic life of Machines	(5 years)	
Annual depreciation	(44,00,000/5)	8,80,000
Annual transmission cost	(32 hrs. transmission×8 locations × Rs. 300 per hour)	76,800
Annual cost of operation	(8,80,000+76,800)	9,56,800

Option III : Engaging Video Conferencing Facility on Rental Basis *(Rs.)*

Rental cost	(32 hrs. ×8 location×Rs. 1,500 per hr.)	3,84,000
Telephone cost	(32 hrs.×8 locations×Rs. 400 per hr.)	1,02,400
Total rental cost of equipment	(3,84,000+1,02,400)	4,86,400

Analysis : The annual cash outflow is minimum, if video conferencing facility is engaged on rental basis. Therefore, Option III is suggested.

Illustration 33 : X Ltd. an existing profit-making company, is planning to introduce a new product with a projected life of 8 years. Initial equipment cost will be Rs. 120 lakhs and additional equipment costing Rs 10 lakhs will be needed at the beginning of third year. At the end of the 8 years, the original equipment will have resale value equivalent to the cost of removal, but the additional equipment would be sold for Rs. 1 lakh. Working Capital of Rs. 15 lakhs will be needed. The 100% capacity of the plant is of 4,00,000 units per annum, but the production and sales-volume expected are as under :

Year	*Capacity (%)*
1	20
2	30
3-5	75
6-8	50

A sale price of Rs. 100 per unit with a Profit-Volume Ratio of 60% is likely to be obtained. Fixed Operating Cash Cost are likely to be Rs. 16 lakhs per annum. In addition to this the advertisement expenditure will have to be incurred as under.

Year	*1*	*2*	*3-5*	*6-8*
Expenditure	30	15	10	4

The company is subject to 50% tax, straight-line method of depreciation, (permisible for tax purposes also) and taking 12% as appropriate after tax cost of capital, should the project be accepted?

Solution :

Present Value of Cash outflow *(Rs.)*

Year 0	Equipment cost	(1,20,00,000 × 1,000)	1,20,00,000
Year 0	Working capital	(15,00,000 × 1,000)	15,00,000
Year 2	Additional equipment	(10,00,000 × 0.797)	7,97,000
P.V. of Cash outflow			1,42,97,000

Calculation of Cash inflows

Years	1	2	3-5	6-8
Capacity utilisation	20%	30%	75%	50%
Production & Sales (units)	80,000	1,20,000	3,00,000	2,00,000
Contribution @ Rs. 60 p.u. (i)	48,00,000	72,00,000	1,80,00,000	1,20,00,000
Fixed cost	16,00,000	16,00,000	16,00,000	16,00,000
Advertisement	30,00,000	15,00,000	10,00,000	4,00,000
Depreciation	15,00,000	15,00,000	16,50,000	16,50,000
(ii)	61,00,000	46,00,000	42,50,000	36,50,000
PBT (i) - (ii)	(13,00,000)	26,00,000	1,37,50,000	83,50,000
Less : Tax @ 50%	–	13,00,000	68,75,000	41,75,000
PAT	(13,00,000)	13,00,000	68,75,000	41,75,000
Add : Depreciation	15,00,000	15,00,000	16,50,000	16,50,000
Cash inflow	2,00,000	28,00,000	85,25,000	58,25,000

Calculation of Present Value of Cash inflows   *(Rs.)*

Years	*Cash inflow*	*Discount factor*	*Present Value*
1	2,00,000	0.893	1,78,600
2	28,00,000	0.797	22,31,600
3	85,25,000	0.712	60,69,800
4	85,25,000	0.636	54,21,900
5	85,25,000	0.567	48,33,675
6	58,25,000	0.507	29,53,275
7	58,25,000	0.452	26,32,900
8	58,25,000	0.404	23,53,300
8 (Working Capital)	15,00,000	0.404	6,06,000
8 (Salvage value)	1,00,000	0.404	40,400
P.V. of cash inflow			2,73,21,450

NPV = 2,73,21,450 – 1,42,97,000 = Rs. 1,30,24,450

Analysis : Since NPV is positive, the Project can be accepted.

Illustration 34 : Playmates Ltd. manufactures toys and other short-lived fad items. The Research and Development Department has come up with an item that would make a good promotional gift for office equipment dealers. As a result of efforts by the Sales personnel, the firm has commitments for this product. To produce the quantity demanded Playmates Ltd. will need to buy additional machinery and rent additional space. It appears that about 25,000 sq. ft. will be needed; 12,500 sq. ft. of presnetly unused space, but leased at the rate of Rs. 3 per sq. ft. per year is available. There is another 12,500 sq. ft. adjoining the facility available at the annual rent of Rs. 4 per sq. ft.

The equipment will be purchased for Rs. 9,00,000. It will require Rs. 30,000 in modification and Rs. 1,50,000 for installation. The equipment will have a salvage value of about Rs. 2,80,000 at the end of the third year. It is subject to 25% depreciation on Reducing Balance Basis. The firm has no other assets in this block. No additional general overhead costs are expected to be incurred.

Estimates of revenue and costs for this product for three years have been developed as follows :

(Rs.)

Particulars	Year 1	Year 2	Year 3
Sales	10,00,000	20,00,000	8,00,000
Less : Costs :			
Material, Labour and Overheads	4,00,000	7,50,000	3,50,000
Overheads allocated	40,000	75,000	35,000
Rent	50,000	50,000	50,000
Depreciation	2,70,000	2,02,500	Nil
Total Costs	7,60,000	10,77,500	4,35,000
Earnings before taxes	2,40,000	9,22,500	3,65,000
Less : Taxes	84,000	3,22,875	1,27,750
Earnings after taxes	1,56,000	5,99,625	2,37,250

If the company sets a required rate of return of 20% after taxes, sould this project be accepted?

Note : P.V. factor @ 20% for Year 1 = 0.833; Year 2 = 0.694; and Year 3 = 0.579

Solution :

$$\text{Tax rate} = \frac{84,000}{2,40,000} \times 100 = 35\%$$

Calculation of Loss on Sale of Equipment *(Rs.)*

Cost of equipment		9,00,000
Modification & installation cost	(30,000+1,50,000)	1,80,000
Initial cash outlay		10,80,000
Less : 1st Year Depreciation	(10,80,000×25/100)	2,70,000
		8,10,000
Less : 2nd Year Depreciation	(8,10,000×25/100)	2,02,500
Written down value at the beginning of 3rd year		6,07,500
Less : Salvage value		2,80,000
Loss on sale of equipment		3,27,500

Opportunity cost of lease rent lost = 12,500 sq. ft. × Rs. 3 = Rs. 37,500

Calculation of Cash inflow (Rs.)

Particulars		Year 1	Year 2	Year 3
Sales	(i)	10,00,000	20,00,000	8,00,000
Incremental cost				
Material, Labour and overhead		4,00,000	7,50,000	3,50,000
Oppotunity cost of lease rent lost		37,500	37,500	37,500
Rent payable		50,000	50,000	50,000
Depreciation		2,70,000	2,02,500	–
	(ii)	7,57,500	10,40,000	4,37,500
EBT	(i) - (ii)	2,42,500	9,60,000	3,62,500
Less : Tax @ 35%		84,875	3,36,000	1,26,875
EAT		1,57,625	6,24,000	2,35,625
Add : Depreciation		2,70,000	2,02,500	–
Cash inflow after tax		4,27,625	8,26,500	2,35,625

Calculation Present Value of Cash Inflow After Tax

Year	Cash inflow after tax	Discount factor @ 20%	Present Value
1	4,27,625	0.833	3,56,212
2	8,26,500	0.694	5,73,591
3	2,35,625	0.579	1,36,427
3 (Salvage value)	2,80,000	0.579	1,62,120
3 Tax advantage on short term loss (3,27,500×0.35)	1,14,625	0.579	66,368
P.V. of Cash inflow			12,94,718

NPV = 12,94,715 – 10,80,000 = Rs. 2,14,718

Analysis : Since NPV of the Project is positive, it is suggested to accept the Project.

Illustration 35 : X Ltd. has for some years manufactured a product called C which is used as a component in a variety of electrical items. Although the product C is in demand, the technology of the design is becoming obsolete. The company has developed a new product D which is based on new technology.

The management of X Ltd. is considering whether to continue production of C or discontinue the C and start production of D. The company do not have the resources to produce both the products.

If C is produced, unit Sales in year 1 are forecasted to be 24,000 but declining by 4,000 units in each subsequent year. Additional equipment costing Rs. 70,000 must be purchased now if production of C is to continue.

If D produced, then unit sales in year 1 are forecasted to be 6,000 but after that the sales will increase rapidly. Additional equipment costing Rs. 6,20,000 should be purchased now if production of D is to start.

Relevant details of the two products are as follows :   (Rs.)

	C	D
Variable cost per unit	25	50
Selling price per unit	55	105

The company appraises investments using 12% per annum compound cost of Money and ignores cash flows beyond five year from the start of investment.

(a) Advise the company on the minimum annual growth in units sales of D needed to justify starting production of D now. Support your answer with financial evaluation.

(b) Advise management of the number of years to which its investment appraisal time horizon (Currently five years) would have to be extended in order to justify sarting production D now if the forecast annual increase in D sales is 2,800 units.

P. V of Re. 1 at 12% discount are as follows :

Year	1	2	3	4	5	6	7	8
P.V.	0.8929	0.7972	0.7118	0.6355	0.5674	0.5067	0.4523	0.4039

Solution :

(a) The minimum annual growth in unit sales of D needed to justify production of D now is approximately 3400 units per annum. As existing fixed fosts are unaffected by the decision and the alternatives are mutually excluisve, the relevant cash flows are the extra investment cost for and contributions from D.

Assume that the sales of D Increase by 6000 units per annum

Year	Net investment	Contribution foregone from C	Contribution from D	Net cash flow	Discount factor	Present value
0	*(5,50,000)	—	—	(5,50,000)	1.000	(5,50,000)
1	—	(7,20,000)	3,30,000	(3,90,000)	0.8929	(3,48,230)
2	—	(6,00,000)	6,60,000	60,000	0.7972	47,830
3	—	(4,80,000)	9,90,000	5,10,000	0.7118	3,63,000
4	—	(3,60,000)	13,20,000	9,60,000	0.6355	6,10,100
5	—	(2,40,000)	16,50,000	14,10,000	0.5674	8,00,000
NPV						9,22,700

* Additional cost of equipment for D less cost saved by not buying additional equipment for C.

(b) Additional sales of D increase by 2,800 units p.a.

Year	Net investment	Contribution foregone from C	Contribution from D	Net cash flow	Discount factor	Present value
0	(5,50,000)	—	—	(5,50,000)	1.000	(5,50,000)
1	—	(7,20,000)	3,30,000	(3,90,000)	0.8929	(3,48,200)
2	—	(6,00,000)	4,84,000	(1,16,000)	0.7972	(92,500)
3	—	(4,80,000)	6,38,000	1,58,000	0.7118	1,12,500
4	—	(3,60,000)	7,92,000	4,32,000	0.6355	2,74,500
5	—	(2,40,000)	9,46,000	7,06,000	0.5674	4,00,600
					NPV =	(2,03,100)
6		(1,20,000)	11,00,000	9,80,000	0.5066	4,96,500

Therefore the time horizon is extended by approximately $\dfrac{2,03,100}{4,96,500} = 0.41$ of a year (*i.e.,* 5 months) to 5 years and 5 months.

2.4 Replacement and Lease Decisions

This Section includes

- **Meaning of Replacement and Retirement**
- **Reasons of Replacement / Retirement**
- **Lease Rental Alternatives**
- **Buy or Lease**

INTRODUCTION :

'When to replace individual units of durable equipment by similar or improved units is one of the main problems upon which the success of industrial enterprise depends.' –Gabriel Preinreich

For the past 50 years, mass production of goods and services by the manufacturing and process industries has proved to be a most efficient means of satisfying human wants and needs. To achieve these ends, however, industry has shown a high propensity of consume vast quantities of capital resources, either due to physical impairment or because of the inevitable obsolescence experienced by capital assets. To remain competitive, therefore, necessiates the timely replacement of existing assets and their eventual retirement.

MEANING : The term *'replacement'* can be rather ambiguous. Replacement does not mean that an asset has to be duplicated at the end of its economic life, nor does it imply a like-for-like substitution indeed no resemblance betwen the present asset and its successor is necessary. Instead, *'replacement'* in this context is synonymous with *'displacement'*, which simply means that an existing asset is displaced by a more economic one. This implies that the end product or service involved with a replacement decision remains the same, but the means (process, methods, systems, machines and tools) of accomplishing that objective can alter quite radically.

The term *'retirement'* means that an asset is definitely disposed of. In some instances this might entail selling a group of assets as a going concern, in which case one is really conccerned with divestment decisions. In other circumstances, however, assets are sold for their second-hand or scrap value. In some extreme condiions it is also conceivable that a company might have to spend money to dispose of certain assets, either because of some contractual agreement which was involved with their initial purchase, or because their disposal has certain social and/or legal implications.

BASIC REASONS FOR REPLACEMENT/RETIRING OF ASSET : The two basic reasons for replacing and ultimately retiring an asset are (*a*) physical impairment and (*b*) technological obsolescence.

The first involves the condition of the asset itself, whereas the second concerns conditions in the environment which are external to an asset. These two effects can occur independently, or in concert.

- *Physical impairment :* Physical deterioration can lead to a loss in the value of the service rendered by an asset and /or an increase in its consumption of resources needed to provide a pescribed level of service. For example, corrosion, erosion and general wear

and tear can prevent a machine from manufacturing its specified output of product thereby causing its sales revenue to decline, whereas a specified production rate might possibly be attained if more monies were spent on its ordinary repairs and maintenance.

- *Technological obsolescence* : Obsolescence, however, is the change in the technical characteristics of new assets which enhances their vaue relative to older assets and it results from product, labour and process innovations. More often than not, this rate of enhancement is sufficiently large to warrant the replacement of existing assets which are still in good physical condition and profitable. In other cases, however, replacement is justified because a decline in a firm's sales renders its existing production capacity too large and expensive so that it is forced to retrench, at least temporarily, using smaller plant employing the same or more efficient technology.

Company X needs a machine which if purchased outright will cost Rs. 10 lakhs. A Hire Purchase and Leasing Company has offered two alternatives as below :

Option : Hire Purchase

Rs. 2,50,000 will be payable on signing of the agreement. 3 annual installements of Rs. 4,00,000 will be payable at the end of the year starting from year 1. The ownership in the machine will be transferred automatically at the end of the 3rd year. It is assumed that Company X will be able to claim depreciation on straight line basis with zero salvage value.

Option : Lease

Rs. 20,000 will be payable towards initial service fee upon singing of the agreement. Annual lease rent of Rs. 4,32,000 is payable at the end of each year starting from the first, for a period of 3 years.

Company X's tax rate is 35%.

Evaluate the two alternatives and advice the Company as to which one implies least cost.

Solution :

Option A : Hire Purchase

Calculation of Finance Charges

End of the year	HP Installments	Finance Charges	Cash Price
	Rs.	Rs.	Rs.
0	250000	—	250000
1	400000	225000	175000
2	400000	150000	250000
3	400000	75000	325000
	1450000	450000	1000000

** The Total Charges allocated in the ratio of HP Price outstanding i.e. 3:2:1

Calculation of Annual Depreciation : Rs. 1000000/3 = Rs. 333333

Calculation of Cash Outflow :

End of the year	HP Installments on Fin. Charges + Depreciation	Tax Shield @35%	Net Outflow
	Rs.	Rs.	Rs.
0	250000	–	250000
1	400000	195417	204583
2	400000	169167	230833
3	400000	142917	257083

Calculation of Present Values

End of the Year	PVF @ 10%	PV	PVF @ 20%	PV
0	1.00	250000	1.00	250000
1	0.91	186171	0.83	169804
2	0.83	191591	0.69	159275
3	0.75	192812	0.58	149108
Total		820574		728187

The net cash outflows when disconted at 20% comes down by Rs. 92387 (i.e. 820574–728187). The effective cost of finance, is found out by calculating the rate at which the present values equal Rs. 650000 (i.e. Rs. 1000000×0.65) (i.e. cost of asset×(1-t)).

$$\text{Effective cost of finance} = 10\% + \left(\frac{170574}{92387} \times 10\right) = 28.46\%$$

Option B : Leasing

Cash Flows :

End of the Year	Lease Charges	Tax Shield @ 35%	Net Outflow
Rs.	Rs.	Rs.	
0	20000	–	20000
1	432000	151200	280800
2	432000	151200	280800
3	432000	151200	280800

Calculation of Present Values

End of the Year	PVF @ 10%	PV	PVF @20%	PV
0	1.00	20000	1.00	20000
1	0.91	255528	0.83	233064
2	0.83	233064	0.69	193752
3	0.75	210600	0.58	162864
TOTAL		**699192**		**609680**

The net cash outflows when discounted at 20% comes doen by Rs. 89,512 (i.e. 735286–603870). The effective cost of financing under the lease option is calculated below :

$$\text{Effective cost financing } = 10\% + \left(\frac{49,192}{89,512} \times 10 \right) = 15.49\%$$

Calculation : Option B, i.e. lease option implies lesat cost.

LEASE RENTAL ALTERNATIVES :

LEASE FINANCING

Concept of Leasing :

Leasing, as a financing concept, is an arrangement between two parties, the leasing company or lessor and the user or lessee, whereby the former arranges to buy capital equipment for the use of the latter for an agreed period to time in return for the payment of rent. The rentals are predetermined and payable at fixed intervals of time, according to the mutual convenience of both the parties. However, the lessor remains the owner of the equipment over the primary period.

By resorting to leasing, the lessee company is able to exploit the economic value of the equipment by using it as if he owned it without having to pay for its capital cost. Lease rentals can be conveniently paid over the lease period out of profits earned from the use of the equipment and the rent is cent percent tax deductible.

I.   **Lease is defined as follows :**

- **Dictionary of Business and Management –**

  'Lease is a form of contract transferring the use or occupancy of land, space, structure or equipment, in consideration of a payment, usually in the form of a rent.'

- **James C. Van Horne –**

  'Lease is a contract whereby the owner of an asset (lessor) grants to another party (lessee) the exclusive right to use the asset usually for an agreed period of time in return for the payment of rent.

II. TYPES OF LEASING :

Finance Lease and Operating Lease :

Finance Lease: According to the International Accounting Standards (IAS-17), in a finance lease, the lessor transfers to the lessee substantially all the risks and rewards incidental to the ownership of the asset whether or not the title is eventually transferred. It involves payment of rentals over an obligatory non-cancellable lease period, sufficient in total to amortise the capital outlay of the lessor and leave some profit. In such leases, the lessor is only a financier and is usually not interested in the assets. It is for this reason that such leases are also called as **full payout leases** as they enable a lessor to recover his investment in the lease and earn a profit. Types of assets included under such lease are ships, aircrafts, railway wagons, lands, buildings, heavy machinery, diesel generating sets and so on.

Operating Lease : According to the IAS-17, an operating lease is one which is not a finance lease. In an operating lease, the lessor does not transfer all the risks and rewards incidental to the ownership of the asset and the cost of the asset is not fully amortised during the primary lease period. The lessor provides services (other than the financing of the purchase price) attached to the leased asset, such as maintenance, repair and technical advice. For this reason, operating lease is also called Service lease. The lease rentals in an operating lease include a cost for the 'services' provided, and the lessor does not depend on a single lessee for recovery of his cost. Operating lease is generally used for computers, office equipments, automobiles, trucks, some other equipments, telephones, and so on.

Direct Lease : In direct lease, the lessee, and the owner of the equipment are two different entities. A direct lease can be of two types: Bipartite and Tripartite lease.

Bipartite Lease : There are two parties in the lease transaction : (i) equipment supplier-cum-lessor and (ii) lessee. Such type of lease is typically structured as an operating lease with inbuilt facilities, like upgradation of the equipment (Upgrade lease), addition to the original equipment configuration and so on. The lessor maintains the asset and, if necessary, replaces it with a similar equipment in working conditions (Swap lease).

Tripartite Lease : Such type of lease involves three different parties in the lease agreement: equipment supplier, lesssor and lessee. An innovative variant of tripartite lease is the sales-aid lease under which the equipment supplier arranges for lease finance in various forms by :

- Providing reference about the customer to the leasing company;

- Negotiating the terms of the lease with the customer and completing all the formalities on behalf of the leasing company;

- Writing the lease on his own account and discounting the lease receivables with the designated leasing company.

The sales-aid lease is usually with recourse to the supplier in the event of default by the lessee either in the form of offer from the supplier to buy back the equipment from the lessor or a guarantee on behalf of the lessee.

Single Investor Lease and Leveraged Lease

Single Investor Lease : There are only two parties to the lease transaction, the lessor and the lessee. The leasing company (lessor) funds the entire investment by an appropriate mix of debt and equity funds. The debts raised by the leasing company to finance the asset are without recourse to the lessee, that is, in the case of default in servicing the debt by the leasing company, the lender is not entitled to payment from the lessee.

Leveraged Lease : There are three parties to the transaction: (1) lessor (equity investor), (2) lender and (3) lessee. In such a lease, the leasing company (equity investor) buys the asset through substantial borrowing with full recourse to the lessee and without any recourse to itself. The lender (loan participant) obtains an assignment of the lease and the rentals to be paid by the lessee. The transaction is routed through a trustee who looks after the interest of the lender and lessor. On receipt of the rentals from the lessee, the trustee remits the debt-service component of the rental to the loan participant and the balance to the lessor.

Domestic Lease and International Lease :

Domestic Lease : A lease transaction is classified as domestic if all parties to the agreement, namely, equipment supplier, lessor and the lessee, are domiciled in the same country.

International Lease : If the parties to the lease transaction are domiciled in different countries, it is known as international lease. This type of lease is further subclassified into import lease and cross-border lease.

Import Lease : In an import lease, the lessor and the lessee are domiciled in the same country but the equipment supplier is located in a different country. The lessor imports the asset and leases it to the lessee.

Cross-Border Lease : When the lessor and the lessee are domiciled in different countries, the lease is classified as cross-border lease. The domicile of the supplier is immaterial.

Sale and Lease Back :

Under both the direct lease and the leveraged lease, the lessee acquires the asset after the lease arrangement. However, in case of sale and lease back, the situation is different. The lessee is already the owner of the assets. He, under the lease agreement, sells the assets to the lessor who, in turn, leases the assets back to the owner (now the lessee). Under the sale and lease back, the lessee not only retains the use of the assets but also gets funds from the 'sale' of the assets to the lessor. The sale and lease back is usually preferred by firms having fixed assets but shortage of funds.

FORMS OF LEASE RENTALS :

The lease rentals may be quoted in several forms, for instance

i) Level or constant period

ii) Stepped where the lease rental increases at a fixed percentage over the earlier period,

iii) Deferred, where the rental is deferred for certain periods to accommodate gestation period,

iv) Ballooned under which major part of the rentals is collected in a lump sum at the end of the primary period,

v) Bell – shaped where the rental is gradually stepped up, rises to its peak in the middle of the lease period and is then gradually stepped down and

vi) Zig-zag where the rental is stepped up in one period and then stepped down in the succeeding period and so on.

Illustration 1 :

A company has received 3 proposals for the acquisition of an assets on lease costing Rs. 1,50,000.

Option I : The terms of offer envisaged payment of lease rentals for 96 months. During the first 72 months, the lease rentals were to be paid @ Rs. 30 p.m. per Rs. 1,000 and during the reamining 24 months @ Rs. 5 p.m. per Rs. 1,000. At the expiry of lease period, the lessor has offered to sale the assets at 5% of the original cost.

Option II : Lease agreement for a period of 72 months during whcih lease rentals to be paid per month per Rs. 1,000 are Rs. 35, Rs. 30, Rs. 26, Rs. 24, Rs. 22 and Rs. 20 for next 6 years. At the end of lease period the asset is proposed to be abandoned.

Option III : Under this offer a lease agreement is proposed to be signed for a period of 60 months wherein a initial lease deposit to the extent of 15% will be made at the time of signing of agreement. Lease rentals @ Rs. 35 per Rs. 1,000 per months will have to be paid for a period of 60 months. On the expiry of leasing agreement, the assets shall be sold against the initial deposit and the asset is expected to last for a further period of three years.

You are requred to evaluate the proposals keeping in view the following parameters.

(i)   Depreciation @ 25%

(ii)   Discounting rate @ 15%

(iii)   Tax rate applicable @ 40%

The monthly and yearly discounting factors @ 15% discount rate are as follows :

Period	1	2	3	4	5	6	7	8
Monthly	0.923	0.795	0.685	0.590	0.509	0.438	0.377	0.325
Yearly	0.869	0.756	0.658	0.572	0.497	0.432	0.376	0.327

Solution :

Given below are the three tables showing the calculations to decide the best option.

Option I   **[Amount in Rs.]**

1	2	3	4	5	6	7	8
Year	Rentals	Monthly Dis. Factor @ 15%	PV of (2)	Tax Shield (2)×40%	Annual Disc. Factor @ 15%	PV of (5)	Net Cash Flow (4-7)
1	54000	0.923	49842	21600	0.869	18770	31072
2	54000	0.795	42930	21600	0.756	16330	26600
3	54000	0.685	36990	21600	0.658	14213	22777
4	54000	0.590	31860	21600	0.572	12355	19505
5	54000	0.509	27486	21600	0.497	10735	16751
6	54000	0.438	23652	21600	0.432	9331	14321
7	9000	0.377	3393	3600	0.376	1354	2039
8	9000	0.325	2925	3600	0.327	1177	1748
End	7500	0.327	2452	–			2452
		0.327 is Year ending discounting factor					**137265**

Option II   **[Amount in Rs.]**

1	2	3	4	5	6	7	8
Year	Rentals	Monthly Dis. Factor @ 15%	PV of (2)	Tax Shield (2)×40%	Annual Disc. Factor @ 15%	PV of (5)	Net Cash Flow (4-7)
1	63000	0.923	58149	25200	0.869	21899	36250
2	54000	0.795	42930	21600	0.756	16330	26600
3	46800	0.685	32058	18720	0.658	12318	19740
4	43200	0.590	25488	17280	0.572	9884	15604
5	39600	0.509	20156	15840	0.497	7872	12284
6	36000	0.438	15768	14400	0.432	6221	9547
							120025

Option III   [Amount in Rs.]

1	2	3	4	5	6	7	8
Year	Rentals	Monthly Dis. Factor @ 15%	PV of (2)	Tax Shield (2)×40%	Annual Disc. Factor @ 15%	PV of (5)	Net Cash Flow (4-7)
0	**22500**	**1.000**	**22500**	—	—	—	**22500**
1	63000	0.923	58149	25200	0.869	21899	36250
2	63000	0.795	50085	25200	0.756	19051	31034
3	63000	0.685	43155	25200	0.658	16582	26573
4	63000	0.590	37170	25200	0.572	14414	22756
5	63000	0.509	32067	25200	0.497	12524	19543
6	—		0	5625*	0.432	2430	-2430
7	—		0	4219*	0.376	1586	-1586
8	—		0	3164*	0.327	1035	-1035
Terminal	Depn.		0	9492*	0.284	2696	-2696
							150909

* Since the lessor is selling asset to lessee at the end of 5 years against deposit of 15% of Rs. 150000 *i.e.* Rs. 22,500, Lesee becomes the owner and starts claiming tax benefit on depreciation for the next three years. (assumed to be WDV at 25%)

Depreciation schedule :

Year	Orignal Cost Rs.	Depreciation Rs.	Outstanding
1	22500	5625	16875
2	16875	4219	12656
3	12656	3164	9492
4	9492	9492	0

Advice :

Analyzing these table it is concluded that :

Since the net effective cost of Option II is the least, it is advisable to choose the same.

Illustration 2 :

The following details relate to an investment proposal of XYZ Ltd.

Investment outlay Rs. 100 lakhs

Lease Rentals are payable at Rs. 180 per Rs.1000

Term of lease 8 years

Cost of capital for the firm is 12%

Find the Present Value of Lease Rentals if

a. Lease Rentals are payable at the end of the year

b. Lease Rentals are payable at the beginning of the year

Solution :

Lease Rentals paid per annum = Rs. 180 × 10000 = Rs. 18 lakhs

a. If Lease Rentals are payable at the year end :

Present Value of Lease Rentals   = Rs. 18 lakhs × PV factors for years [1-8]

= Rs. 18 lakhs × PVIFA (12%, 8)

= Rs. 18 lakhs × 4.9676

= Rs. 89,41,680

b. If Lease Rentals are payable at the begining :

Present Value of Lease Rentals   = Rs. 18 lakhs × PV factors for years [0-7]

= Rs. 18 lakhs × [1 +PVIFA (12%, 7)]

= Rs. 18 lakhs × [1 +4.5638]

= Rs. 100,14,840

Illustration 3 :

Find out Loan payments per annum for the following :

Cost of Equipment : Rs. 50 lakhs

Borrowing rate : 15%

Term of Loan : 5 years

a. Principal is payable in equal installment over the period of five years

b. Amount of Loan is payable equally over the period of five years

Prepare a table showing principle & interest payments and the total payable over period of five years.

Solution :

a. If principle is payable in equal installments :

Each installment = Rs. 50 lakhs/5 = Rs. 10 lakhs

Opening Balance	Principle	Interest	Balance
50 Lakhs	10 Lakhs	7.50 Lakhs	40 Lakhs
40 Lakhs	10 Lakhs	6.00 Lakhs	30 Lakhs
30 Lakhs	10 Lakhs	4.50 Lakhs	20 Lakhs
20 Lakhs	10 Lakhs	3.00 Lakhs	10 Lakhs
10 Lakhs	10 Lakhs	1.50 Lakhs	Nil
TOTAL	**50 Lakhs**	**22.50 Lakhs**	

Total Payable : Rs. 50 lakhs + Rs. 22.50 Lakhs = Rs. 72.50 Lakhs

b. If loan is payable in equal installments:

Each installment = Rs.50 Lakhs/PVIFA (15%, 5) = Rs.50 Lakhs/3.3522 = Rs.1491558

Opening Balance	Installment	Interest	Principle	Balance
5000000	1491558	750000	741558	4258442
4258442	1491558	638766	852792	3405650
3405650	1491558	510848	980710	2424940
2424940	1491558	363741	1127817	1297123
1297123	1491558	194568	1297123	Nil
TOTAL	**7457790**	**2457923**	**5000000**	

Total Payable : Rs. 50 lakhs + Rs. 2457923 lakhs = Rs. 7457923 Lakhs

NET ADVANTAGE OF LEASING - NAL Method

If a firm goes for leasing what it gets and what it foregoes :

What it gets		What it spends/foregoes	
Pv of Tax Benefit on Lease Rentals	A	PV of Lease rentals	C
		By not going for Debt, it foregoes:	
Investment Outlay (Not Spent)	B	PV of Interest Tax Shield	D
		PV of Depreciation Tax Shield	E
		PV of Salvage Value	F
TOTAL	**A+B**		**C+D+E+F**

If A+B > C+D+E+F, then go for leasing, else Borrowing.

Note: In NAL meyhod we use of debt (and not cost of capital) to find PV of lease rentals as we are finding the benefit of leasing 'instead of borrowing'. And the PV of tax-shields are

arrived at by using the opportunity cost of capital. And we also use the PV of lease rentals as the amount that will be borrowed.

Illustration 4 :

The following details relate to an investment proposals of HI Ltd.

- Investment outlay Rs.180 lakhs

- Net salvage value after 3 years, Rs. 18 lakhs

- Annual rate of Depreciation 40%

HI Ltd. has two alternatives.

Option I: Borrow and buy the equipment @ 17% p.a, Marginal rate of Tax 35%;

Cost of capital of HI Ltd. 12%

Option II: Lease on 3 years full payout basis@ Rs. 444/Rs.1000 payable annually in arrear. Which option HI Ltd. should choose and why?

Solution :

	Decision Analysis:	(Rs.lakhs)
	What it gets	
1.	Investment Outlay :	(180.00)
2.	Less : PV of Lease rentals (Working Note 1)	176.61
	What it spends/foregoes	
3.	Add : PV of Tax Shield on Lease Rentals (Working Note 2)	67.19
4.	Less : PV of tax shields on Depreciation (Working Note 3)	41.01
5.	Less : PV of Interest shields on Displaced Debt (Working Note 4)	18.29
6.	Less : PV of Salvage value (Working Note 5)	2.81
	NAL / NPV (L)	**(1.53)**

Since NAL is negative lease is not economically vaible.

Working Notes :

1. PV of lease rentals = Rs. 180 lakhs × 444/1000 × PVIFA (17,3) = Rs. 79.92 × 2.21
   = Rs. 176.61 lakhs

2. PV of Tax shield on lease rentals = Rs. 180 lakhs×444/1000× 0.35×PVIFA (12,3)
   = Rs. 27.972 lakhs × 2.402 = Rs. 67.19 Lakhs

3. PV of Tax shield on depreciation = [72 × PVIF (12, 1) +43.2 × PVIF (12,2) +25.92 × PVIF (12,3)] × 0.35 = [72 × 0.893 +43.2 × 0.797 +25.92 ×0.712] × 0.35
   = Rs. 41.01 lakhs

   <u>Calculation of Depreciation :</u>

   Year 1   0.4 * 180 = 72
   Year 2   0.4 * (180 - 72) = 43.2
   Year 3   0.4 * (180 - 72- 43.2) = 25.92

4. PV of interests Tax shield on Displaced Debt: (assuming that instead of lease, total PV of the lease rentals has been borrowed)

Displaced debt (PV of lease rentals) Amortization schedule (Rs. lakhs)

Year	Loan O/s beginning	Interest @ 17%	Capital	Installment amount 176.61 ÷ 2.210
1	176.61	30.03	49.89	79.92
2	126.72	21.54	58.38	79.92
3	68.34	11.61	68.34	79.92
Check Total of Capital			**176.61**	

PV of interest Tax shield on Displaced Debt = [30.03 × PVIF (12,1) + 21.54 × PVIF (12,2) +11.61 × PVIF (12,3)] × 0.35 =[30.03 × 0.893 + 21.54 × 0.797 +11.61× 0.712]× 0.35 = Rs. 18.29 lakhs

5. PV of net salvage value = 18 × PVIF (12,3) = 18 × 0.712 = Rs. 12.81 lakhs.

Note : If cost of capital is not given, use borrowing rate i.e. 17 × (1 - 0.35)=11% approx.

Illustration 5 :

Armada Leasing Company is considering a proposal lease out a school bus. The bus can be purchased for Rs. 50,0000 and in turn, be leased out at Rs. 125000 per year for 8 years with payments occuring at the end of each year.

  i. Estimate the IRR for the company assuming tax is ignored.

 ii. What should be the yearly lease payment charged by the company in order to earn 20% annual compounded rate of return before expenses and taxes?

iii. Calculate the annual lease rent to be charged so as to amount to 20% after tax annual compounded rate of return, based on the following assumptions :

   1. Tax rate is 40%

   2. Straight Line Depreciation

   3. Annual expenses of Rs. 50000, and

   4. Resale value Rs. 100000 after the term.

Solution :

  i. Finding IRR (without tax effect)

   We have L× (1 - T) × PVIFA (k %, n years) = PV of Outflow

   Therefore 1.25 lacs × (1 - 0) × PVIFA (k%, 8) = 5 lacs

   Solving we get PVIFA (k,8) = 4

   By interpolating [See Interpolation method explained in Annexures]

   We get IRR = 18.63%

 ii. Finding L, given k (without tax effect)

   We have L× (1 - T) × PVIFA (k%, n years) = pv of Outflow i.e. 5 lacs

L × (1 - 0) × PVIFA (20%, 8) = 5 lacs

Solving we get L = Rs. 130310.13 p.a

iii. Finding L, with tax, depreciation and other data

Let 'L' be the Lease Rental

[(L - expenses - depreciation) (1 - T) + Depreciation] × PVIFA (20%, 8)

+ Salvage value × PVIF (20%, 8) = 5 lacs

By solving the above equation we get,

[(L - 50000 - 50000) (1 - 0.4) + 50000] × 3.837 + 100000 × 0.233 = 5 lacs

L = Rs. 223729.47

Illustration 6 :

The following are the details regarding the machine to be given on lease by X Ltd.

   i. Cost of machine to the lessor is Rs. 1,00,000 financed 80% through debt and balance through equity. Cost of debt before tax amount to 20% and equity 16%.

   ii. The lessor is in 35% tax bracket. The rate of depreciation of machinery is 20% according to diminishing balance method.

   iii. The scrap value of machines is Rs. 10,000 at the end of 5th year.

   iv. Estimated cost for maintenance and general administration in respect of machine is Rs.1,000 per annum.

   v. The lessee agrees to pay the following:

   (a) Annual rent Rs. 36,000 for 5 years. The payment is to be made at the end of each year.

      (b)   The security deposit of Rs. 3,000 which is refundable at the end of lease period without interest.

      (c)   Management fees (non-refundable) payable at the inception of lease period is Rs. 2,500.

You are required to decide whether the lessor should lease the machine using internal rate of return method.

Solution :

Cost of Capital for Lessor

Source	Amount (Rs.)	After tax	Total cost (Rs.)
Equity	20000	16%	3200
Debt	80000	13%	10400
	100000		13600

$$\text{Average cost of capital = Rs. } \frac{13,600}{1,00,000} \times 100$$

$$= 13.6 \text{ \%}$$

Computation of Annual tax liability

	Years				
	1 Rs.	**2** Rs.	**3** Rs.	**4** Rs.	**5** Rs.
Lease revenue	36,000	36,000	36,000	36,000	36,000
Less: Maintenance & Admn. Cost	1,000	1,000	1,000	1,000	1,000
Less: Depreciation	20,000	16,000	12,800	10,240	8,192
Income before tax	15,000	19,000	22,200	24,760	26,808
Less: Income tax @ 35 %	5,250	6,650	7,770	8,666	9,383
Income after tax	9,750	12,350	14,430	16,094	17,425

Computation of Annual Net Cash Inflows

	Years				
	1 Rs.	**2** Rs.	**3** Rs.	**4** Rs.	**5** Rs.
Lease revenue	36,000	36,000	36,000	36,000	36,000
Add : Sale of machinery (Scrap)	-	-	-	-	10,000
Less : Administration cost	1,000	1,000	1,000	1,000	1,000
Less : Refund of deposit	-	-	-	-	3,000
Less : Tax liability	5,250	6,650	7,770	8,666	9,383
	29,750	28,350	27,230	26,334	32,617

Cash outflow at beginning of year 1

		Rs.
Cost of machinery		1,00,000
Less: Management fees	2,500	
Security deposit	3,000	5,500
		94,500

Computation of Internal Rate of Return

Year	Cash outflow Rs.	Cash Inflow Rs	Discount factor @ 14%	Present value Rs.	Discount factor @ 18%	Present value Rs.
0	94,500	-	-	-	-	(94,500)
1		29,750	0.877	26,091	0.847	25,198
2		28,350	0.769	21,801	0.718	20,355
3		27,230	0.675	18,380	0.609	16,583
4		26,334	0.592	15,590	0.516	13,588
5		32,617	0.519	16,928	0.437	14,254
				98,790		89,978
			N.P.V	4,290		-4,522

$$\text{IRR} = 14 + \frac{4,290}{4,290 + 4,522} \times 4$$

$$= 14 + \frac{4,290}{8,812} \times 4$$

$$= 14 + 1.95$$

$$= 15.95$$

The weighted average cost of capital is 13.6 % while I.R.R from leasing out the asset is 15.95%. Hence, it is beneficial for a company to lease out the machinery.

Break Even Lease Rentals (BELR)

Under this method, the lessee is interested in that quantum of lease rental which will match the borrowing option. Thus we find the total present value under the borrowing option and taking that as the benchmark we find the lease rental in the reverse order, keeping in mind the tax effect and other debt that may be provided, like rentals paid in advance etc. Under this method the buyer comes to know of the amount he will actually fork out every year under each option. This helps him to plan his cash flows.

Illustration 7 :

Beta Ltd. is considering the acquisition of a personal computer costing Rs. 50,000. The effective life of the computer is expected to be five years. The company plans to acquire the same either by borrowing Rs. 50,000 from the bankers at 15% interest per annum or by lease. The company wishes to know the lease rentals to be paid annually which will match the loan option. The following further information is provided to you :

    a. The principle amount of the loan will be paid in five annual equal installments.

    b. Interest, lease rental, principle repayment is to be paid on last day of each year.

    c. The full cost of the computer will be written off over the effective life of computer on a straight-line basis and the same will be allowed for tax purposes.

    d. The company`s effective tax rate is 40% and the after tax cost of capital is 9%

    e. The computer will be sold for Rs. 1,700 at the end of the 5th year. The commission on such sales is 9% on the sale value and the same will be paid.

You are required to compute the annual lease rentals payable by Beta Ltd. which will result in indifference to the loan option.

Solution :

Computation of present value of total after tax cash flow under loan option:

1.   Annual Loan installmment = 50000/5 =Rs. 10000

2.   Interested on Loan:

Year	1	2	3	4	5
Principle O/s at the Beginning of the year	50000	40000	30000	20000	10000
Interest @15%	7500	6000	4500	3000	1500

3. Annual Depreciation on SLM Basis: Rs. 50000/5 = Rs. 10000
4. In flow at the end of year 5

	Rs.
Sale Value	1700
Less: Commission at 9%	153
Profit on Sale of Computer 1547 (WDV is Zero)	
Less: Tax at 40%	619
Net Inflow	928

5. Computation of net outflow under loan option:

Year	1	2	3	4	5	Total
Principle Repayment	10000	10000	10000	10000	10000	50000
Interest	7500	6000	4500	3000	1500	22500
TOTAL (A)	**17500**	**16000**	**14500**	**13000**	**11500**	**72500**
Less: Tax Saving at 40%						
On Depreciation	4000	4000	4000	4000	4000	20000
On interest	3000	2400	1800	1200	600	9000
TOTAL (B)	**7000**	**6400**	**5800**	**5200**	**4600**	**29000**
Net Outflow(A-B)	10500	9600	8700	7800	6900	43500
PV factors @ 9%	0.92	0.84	0.77	0.71	0.65	
Present value of Outflow	9660	8064	6699	5538	4485	34446
Less: PV of inflow at the						603
end of 5th Year =928*0.65						
PV of Net Outflow						**33843**

Computation of Annual Lease Rentals :

Steps to calculate Lease Rentals :

Step 1. Let L be the lease rental

Step 2. Find L (1-T)

Step 3. Multiply the same with PVIFA (k%, n) where k is the post tax borrowing rate, n is the number of years

Step 4. Equate this to post tax outflow under borrowing option, to find L

Therefore L × (1 - 0.4) × PV factors for Annuity at 9% for 5 years = PV of Outflow under loan option i.e L × 0.6 × 3.89 = Rs. 33843 → L = Rs. 14500

(Note: This will result in difference to the loan option i.e. both are required)

Therefore, Annual Lease Rentals payable by Beta Ltd. should be Rs. 14500

Illustration 8 :

Evergreen Ltd. typically writes 5 year leases with rentals payable annually in arrears. The following information is available about a lease under review.

Equipment cost   : Rs. 47 lakh (inclusive of CST @ 10%)

Salvage value   : 5% of original cost

After 5 years

Initial Direct cost   : Rs. 0.50 lakh (front ended)

Management Fee   : Rs 0.75 Lakh (front ended)

The marginal cost of capital to Evergreen Ltd. is 16% and the marginal rate of tax is 46%.

Calculate the break even rental for Evergreen Ltd. assuming a tax relevant depreciation rate of :

    (i) 25%

    (ii) 40%

    (iii) 100%

Solution :

Define L as the annual break rental for Evergreen:

The components of NPV (L) to Evergreen can be computed as follows:

a.   Equipment cost   = Rs. 47 lakh

b.   PV of lease Payments $= L \times PVIFA_{(16.5)} = 3.274L$

c.   PV of tax on lease rentals $= 0.46 \times L \times PVIFA_{(16.5)}$

                                       $= 0.46 \times L \times 3.274$

                                       $= 1.506 \, L$

d.   PV of tax shield

On Depreciation [25%] $= [11.75 \times PVIFA_{(16,1)} + 8.81 \times PVIFA_{(16,2)}$

                                 $+ 6.61 \times PVIFA_{(16,3)} + 4.96 \times PVIFA_{(16,4)}$

                                 $+ 3.72 \times PVIFA_{(16,5)}] \times 0.46$

                         $= [(11.75 \times 0.862) + (8.81 \times 0.743)$

                                 $+ (6.61 \times 0.641) + (4.96 \times 0.552)$

                                 $+ (3.72 \times 0.476)] \times 0.46$

                         $= 25.42 \times 0.46$

                         $= Rs. 11.69 \, lakh$

On Depreciation [40%] $= [18.80 \times PVIFA_{(16,1)} + 11.28 \times PVIFA_{(16,2)} +$

                                 $+ 6.77 \times PVIFA_{(16,3)} + 4.06 \times PVIFA_{(16,4)}$

                                 $+ 2.44 \times PVIFA_{(16,5)}] \times 0.46$

                         $= [(18.80 \times 0.862) + (11.28 \times 0.743)$

                                     $+(6.77 \times 0.641) + (4.06 \times 0.552)$

                                     $+ (2.44 \times 0.476)] \times 0.46$

                         $= 32.32 \times 0.46$

                         $= Rs. 14.87 \, lakh$

On Depreciation [100%]	$= 47 \times \text{PVIFA}_{(16,1)} \times 0.46$
	$= 47 \times 0.862 \times 0.46$
	= Rs. 18.63 lakh

e. PV of initial direct cost   = Rs. 0.5 lakh

f. PV of management fee   = Rs. 0.75 lakh

g. Pv of tax shield on initial $= 0.5 \times 0.46 \times \text{PVIF }(16,1)$

Direct cost $= 0.5 \times 0.46 \times 0.862$

    = Rs. 0.198 lakh

h. PV of tax on $= 0.75 \times 0.46 \times \text{PVIFA }(16,1)$

Management fee $= 0.75 \times 0.46 \times 0.862$

    = Rs. 0.297 lakh

i. PV of salvage value $= 2.35 \times \text{PVIFA }(16,5)$

    $= 2.35 \times 0.476$

    = Rs. 1.12 lakh

Given a tax relevant depreciation rate of 25% p.a, L can be obtained from the equation.

    - 47 + 3.274L - 1.506L + 11.69 - 0.5 +0.75 +0.198 - 0.297 + 1.12 = 0

Solving we get 1.768L = 34.04 i.e. L = Rs. 19.25 lakh

Where the relevant depreciation rate is 40% p.a, L can be obtained from the equation.

    - 47 + 3.274L - 1.506L +14.87 - 0.5 +0.75 +0.198 -0.297 +1.12 = 0

Solving we get 1.768L = 30.85 i.e. L= Rs. 17.45 lakh

Where rate of depreciation is 100% L can be obtained from the equation.

    - 47 + 3.274L - 1.506L + 18.63 - 0.5 + 0.75 +0.198 - 0.297 +1.12 = 0

Solving we get 1.768L = 27.10 i.e.   L = Rs.15.33 lakh

BUY OR LEASE :

Illustration 9 :

A company wishes to acquire an asset costing Rs. 1,00,000. The company has an offer from a bank to lend @ 18% repayable in 5 years end installments. A leasing company has also submitted a proposal to the Company to acquire the asset on lease at a yearly rentals of Rs. 280 per Rs. 1000 of the assets value for 5 years payable at year end. The rate of depreciation of the asset allowable for tax purposes is 20% on W.D.V with no extra shift allowance. The salvage value of the asset at the end of 5 years period is estimated to be Rs. 1000. Whether the company should accept the proposal of Bank or leasing company, if the effective tax rate of the company is 50%.

Solution :

Borrowing Option

1	2	3	4	5	6	7	8
Year	Principle	Interest @ 18%	Depre-ciation 20% on on WDV	Tax Shield (3+4)× 50%	Net Cash Flow (2+3)-5	Discount factor = 18(1-0.5)= 9%	Discounted Cash flow @ 9%
1	20000	18000	20000	19000	19000	0.917	17431.19
2	20000	14400	16000	15200	19200	0.842	16160.26
3	20000	10800	12000	11400	19400	0.772	14980.36
4	20000	7200	8000	7600	19600	0.708	13885.13
5	20000	3600	4000	3800	19800	0.650	12868.64
6	- 1000		39000	19500	-20500	0.596	-12223.5
							63102.1

Owing to an inflow of Rs. 1000 (salvage value), The terminal depreciation claim will be Rs. 39000.

Leasing Option

1	2	3	4	5	6
Year	Lease Rentals	Tax shield (2) × 50%	Net Cash Flow (2) - 3	Discount factor	Discounted cash flow @ 9%
1	28000	14000	14000	0.917	12844.04
2	28000	14000	14000	0.842	11783.52
3	28000	14000	14000	0.772	10810.57
4	28000	14000	14000	0.708	9917.953
5	28000	14000	14000	0.650	9099.039
					54455.12

Recommendation : As the NPV of leasing is less, the company should go for leasing

Illustration 10 :

Your company is considering to acquire an additional computer to supplement its time share services to clients. It has two options.

(i) To purchase the computer for Rs. 22 lakhs

(ii) To lease the computer for 3 years from a leasing company for Rs. 5 lakhs as annual lease rent + 10% of gross time share service revenue. The agreement also requires an additional payment of Rs. 6 lakhs at the end of the third year. Lease rents are payable at year-end and the computer reverts to the lessor after the contract period.

The company estimates that the computer under review will be worth Rs. 10 lakhs at the end of the third year. Forecast revenues are:

Year	I	II	III
Amount (Rs. lakhs)	22.5	25	27.5

Annual operation costs excluding depreciation / lease rent of computer are esti mated at Rs. 9 lakhs with an additional Rs. 1 lakh for start up and training costs at the beginning of the first year. These costs are to be borne by the lessee. Your com pany will borrow at 16% interest to finance the acquisition of computer. Repay ment are to be made according to the following schedule:

Year End	I	II	III
Principle	500	850	850
Interest	352	272	136

The company uses the straight line method of depreciation to depreciate its assets and pays 50% Tax on its income. The management approaches the company secretary for advice. Which alternative would be recommended and why?

PV factors for years 1,2,3 for 8% are 0.926, 0.857 & 0.794

PV factors for years 1,2,3 for 10% are 0.909, 0.826 & 0.751

Solution :

Working Notes :

Depreciation = (2200000 - 1000000)/3 = Rs. 400000 p.a

Applicable discount rate for leasing & buying - after tax cost of debt = 16 × (1 - 0.5) = 8%

Operating and training costs are not considered, as they are incurred under both options. Same logic applied for not taking into account the revenues.

Cost of Leasing :

	Years		
	1	2	3
Lease Rent	500000	500000	500000
10% - Gross Revenue	225000	250000	275000
Lump sum payment	–	–	600000
Total	725000	750000	1375000
Tax shield 50%	362500	375000	687500
Net cash Outflow	362500	375000	687500
PV Factor	0.926	0.857	0.794
PV of cash Outflow	335675	321375	545875

Total PV of cash out flow = Rs. 1202925

Cost of Borrowing :

	Years		
	1	**2**	**3**
Principle	500000	850000	850000
Interest	352000	272000	136000
Tax shield on Int. (50%)	176000	136000	68000
Tax shield on Depr. (50%)	200000	200000	200000
Salvage value	0	0	1000000
Net Cash Flow	476000	786000	(282000)
PV Factor	0.926	0.857	0.794
PV of Cash Outflow	440776	673602	(223908)

Total PV of Cash Outflow : Rs. 890470

Suggestion: Since the present value of net cash outflow of borrowing is less, it is suggested to purchase the computer instead of leasing it.

Illustration 11 :

Alfa Ltd. is thinking of installing a computer. Decide whether the computer is to be purchased outright (through 15% borrowing) or to be acquired on lease rental basis. The rate of income-tax may be taken at 40%. The other data available are as under :

Purchase of computer :

Purchase price	Rs. 20 lakh
Annual maintenance (to be paid in advance)	Rs. 50000 p.a
Expected economic useful life	6 years
Depreciation (for tax purposes)	SLM
Salvage value	Rs.2 lakhs

Leasing of computer :

Lease charges to be paid in advance   Rs. 4.50 lakhs

Maintenance expenses to be borne by lessor. Payment of loan is made in 6 year-end installments of Rs. 5,28,474 each.

Solution :

Lease Option :

PV of Cash Outflows under Leasing Alternatives [Amount in Rs.]

Year end	Lease Payment	Tax Shield @40%	Cash outflows after taxes	Pvf (9%,n) 15%(1-0.40)	Total PV
0	400000	-	400000	1.000	400000
1 - 5	400000	160000	240000	3.890	933600
6	-	160000	(160000)	0.596	(95360)
				NPV	1238240

Lease payment = [Rs. 4,50,000 (lease rent) - Rs. 50,000 (saving in maintenance expenses)] = Rs. 4,00,000

Purchase Option :

Debt Payment Schedule   [Amt. in Rs.]

Year End	Loan Installment	Loan at the beginning	Payment		Principle O/s at the end
			Interest	Principle	
1	528474	2000000	300000	228474	1771526
2	528474	1771526	265729	262745	1508781
3	528474	1508781	226317	302157	1206624
4	528474	1206624	180994	347480	859144
5	528474	859144	128872	399602	459542
6	528474	459542	68932	459542	-

PV of Cash Outflows under Buying Alternative   [Amt. in Rs.]

Year End	Loan Installment	Tax advantage @40% on		Net Cash Outflow	PVF (9%,n)	PV of Cash flows
		Interest	Depreciation			
1	528474	120000	120000	288474	0.917	264531
2	528474	106292	120000	302182	0.842	254437
3	528474	90527	120000	317947	0.772	245455
4	528474	72398	120000	336076	0.708	237942
5	528474	51549	120000	356925	0.650	232001
6	528474	27573	120000	380901	0.596	227017
	Total PV of cash Outflows					1461383
	Less: PV of Salvage value (Rs. 200000 × 0.596)					119200
	NPV of Cash Outflows under buying alternative					1342183

Since Cash Outflow of Leasing is lower than that of buying, leasing option should be advised.

Illustration 12 :

Welsh Ltd. is faced with a decision to purchase or acquire on lease a mini car. The cost of the mini car is Rs. 126965. It has a life of 5 years. The mini car can be obtained on lease by paying equal lease rentals annualy. The leasing company desires a return of 10% on the gross value of the asset. Welsh limited can also obtain 100% finance from its regular banking channel. The rate of interest will be 15% p.a and the loan will be paid in five annual installments, inclusive of interest. The effective tax rate of the company is 40%. For the purpose of taxation it is to be assumed that the asset will be written off a period of 5 years on straight line basis.

Advise Welsh Limited about the method of acquiring the car.

What should be the annual lease rental to be charged by the leasing company to match the loan option ?

For your exercise use the following discount factors for five years :

Discount Rate	1	2	3	4	5
10%	0.91	0.83	0.75	0.68	0.62
15%	0.87	0.76	0.66	0.57	0.49
9%	0.92	0.84	0.77	0.71	0.65

Solution :

BUY OPTION :

(a) Annual Loan Repayment : Loan Amount/PVIFA (15%,5) = Rs.126965/3.86 = Rs. 32892

Interest Computation :

Year	0	1	2	3	4
Opening Bal.	126965	94073	75292	53694	28856
Interest 15%	0	14111	11294	8054	4036
Total	126965	108184	86586	61748	32892
Repayment	32892	32892	32892	32892	32892
Closing Bal.	94073	75292	53694	28856	0

Debt Option : Cash Outflows

Year	Install ment	Interest @ 15%	Depre ciation	Tax Shield on Int. & Dep.	Net Cash Outflow	PVF @ 9%	PV of Cash Outflows
0	32892	0	0	0	32892	1.00	32892
1	32892	14111	25393	15802	17090	0.92	15723
2	32892	11294	25393	14675	18217	0.84	15302
3	32892	8054	25393	13379	19513	0.77	15025
4	32892	4036	25393	11772	21120	0.71	14995
5	0	0	25393	10157	(10157)	0.65	(6602)
Total Present Value of Cash Outflows:							87335

LEASE OPTION :

Annual Lease rentals = Cost of assets : [1+PVIFA (10%,4)]

[Note Rentals paid in Advance]

= Rs. 126965 : 4.17 = Rs. 30447

Leasing Alternative :

Year	Lease Payment	Tax Shield on Outflows	After Tax Cash Flow	PV Factors at 9%	PV of Cash Outflows
0	30447	0	30447	1.00	30447
1 - 4	30447	12179	18268	3.24	59188
5	0	12179	(12179)	0.65	(7916)
Total Present Value of Cash Outflows :					81719

Decision : Since PV of Leasing is lower than that of Buying, it is advisable to go for leasing.

(b) Let the Annual Rentals be L

After tax cost of Lease Rentals = 0.60L

PV of Lease Rentals = 0.60L × 4.17 = 2.502L

Equation 2.502L = Rs. 87335, we get L as Rs. 34906

2.5 Working Capital

This section includes :

- **Definition and Classification of Working Capital**
- **Determinants of Working Capital**
- **Measurements of Working Capital**
- **Working Capital Financing**
- **Management of Working Capital**
- **Inventory Management**
- **Cash Management**
- **Receivables Management**

INTRODUCTION :

The term working capital is commonly used for the capital required for day-to-day working in a business concern, such as for purchasing raw material, for meeting day-to-day expenditure on salaries, wages, rents rates, advertising *etc.* But there are much disagreement among various financial authorities (Financiers, accountants, businessmen and economists) as to the exact meaning of the term working capital.

DEFINITION AND CLASSIFICATION OF WORKING CAPITAL :

Working capital refers to the circulating capital required to meet the day to day operations of a business firm. Working capital may be defined by various authors as follows:

1. According to Weston & Brigham - "Working capital refers to a firm's investment in short term assets, such as cash amounts receivables, inventories *etc.*"

2. "Working capital means current assets."   —Mead, Baker and Malott

3. "The sum of the current assets is the working capital of the business"   —J.S.Mill

Working capital is defined as "the excess of current assets over current liabilities and provisions". But as per accounting terminology, it is difference between the inflow and outflow of funds. In the Annual Survey of Industries (1961), working capital is defined to include "Stocks of materials, fuels, semi-finished goods including work-in-progress and finished goods and by-products; cash in hand and bank and the algebraic sum of sundry creditors as represented by (a) outstanding factory payments e.g. rent, wages, interest and dividend; b) purchase of goods and services; c) short-term loans and advances and sundry debtors comprising amounts due to the factory on account of sale of goods and services and advances towards tax payments".

The term "working capital" is often referred to "circulating capital" which is frequently used to denote those assets which are changed with relative speed from one form to another i.e., starting from cash, changing to raw materials, converting into work-in-progress and finished products, sale of finished products and ending with realization of cash from debtors.

Working capital has been described as the "life blood of any business which is apt because it constitutes a cyclically flowing stream through the business".

Working Capital may be classified in two ways

a) Concept based working capital

b) Time based working capital

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                        ┌──────────────────┐
                        │ Working Capital  │
                        └──────────────────┘
                ┌────────────────┴─────────────────┐
        ┌───────────────┐                  ┌───────────────┐
        │ Concept based │                  │  Time based   │
        └───────────────┘                  └───────────────┘
      ┌────────┼─────────┐              ┌────────┴─────────┐
┌──────────┐┌──────────┐┌──────────┐┌──────────────┐┌──────────────┐
│  Gross   ││   Net    ││ Negative ││ Permanent or ││ Temporary or │
│ Working  ││ Working  ││ Working  ││ Fixed Working││ Variable     │
│ Capital  ││ Capital  ││ Capital  ││   Capital    ││ Working      │
│          ││          ││          ││              ││ Capital      │
└──────────┘└──────────┘└──────────┘└──────────────┘└──────────────┘
                                          │                 │
                              ┌───────────┘      ┌──────────┐┌──────────┐
                              │                  │ Seasonal ││ Special  │
                              │                  │ Working  ││ Working  │
                              │                  │ Capital  ││ Capital  │
                              │                  └──────────┘└──────────┘
                    ┌──────────┐  ┌──────────┐
                    │ Regular  │  │ Reserve  │
                    │ Working  │  │ Working  │
                    │ Capital  │  │ Capital  │
                    └──────────┘  └──────────┘
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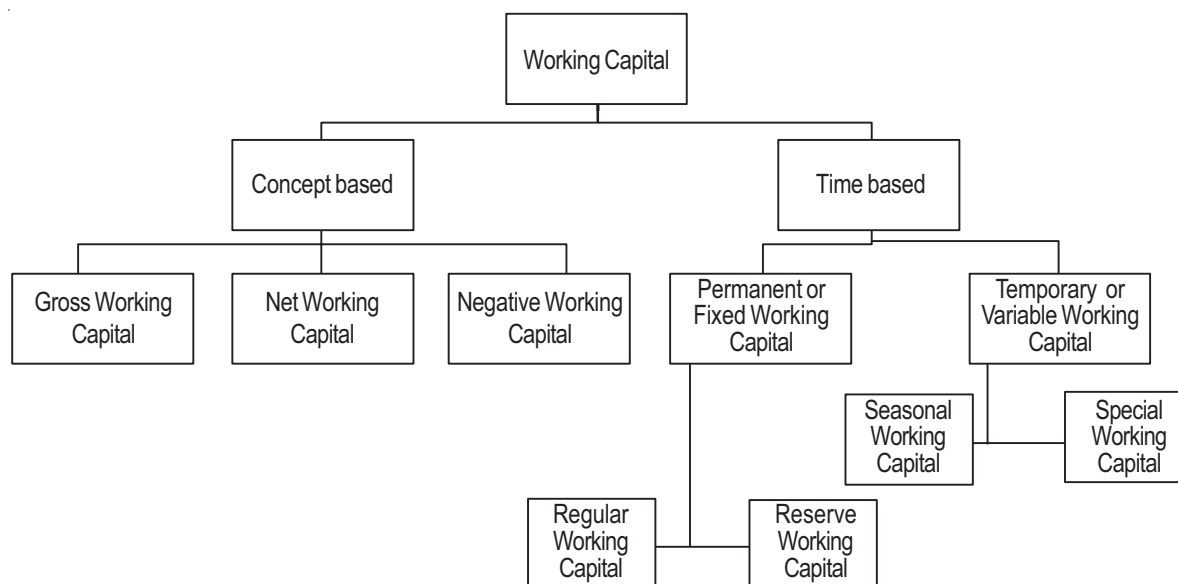
Concepts of working capital

1. **Gross Working Capital**: It refers to the firm's investment in total current or circulating assets.

2. **Net Working Capital**:

The term "Net Working Capital" has been defined in two different ways:

i.   It is the excess of current assets over current liabilities. This is, as a matter of fact, the most commonly accepted definition. Some people define it as only the difference between current assets and current liabilities. The former seems to be a better definition as compared to the latter.

ii. It is that portion of a firm's current assets which is financed by long-term funds.

3. **Permanent Working Capital**: This refers to that minimum amount of investment in all current assets which is required at all times to carry out minimum level of business activities. In other words, it represents the current assets required on a continuing basis over the entire year. Tandon Committee has referred to this type of working capital as "Core current assets".

The following are the characteristics of this type of working capital:

1. Amount of permanent working capital remains in the business in one form or another. This is particularly important from the point of view of financing. The suppliers of such working capital should not expect its return during the life-time of the firm.

2. It also grows with the size of the business. In other words, greater the size of the business, greater is the amount of such working capital and *vice versa*

Permanent working capital is permanently needed for the business and therefore it should be financed out of long-term funds.

4. **Temporary Working Capital**: The amount of such working capital keeps on fluctuating from time to time on the basis of business activities. In other words, it represents additional current assets required at different times during the operating year. For example, extra inventory has to be maintained to support sales during peak sales period. Similarly, receivable also increase and must be financed during period of high sales. On the other hand investment in inventories, receivables, *etc.*, will decrease in periods of depression.

Suppliers of temporary working capital can expect its return during off season when it is not required by the firm. Hence, temporary working capital is generally financed from short-term sources of finance such as bank credit.
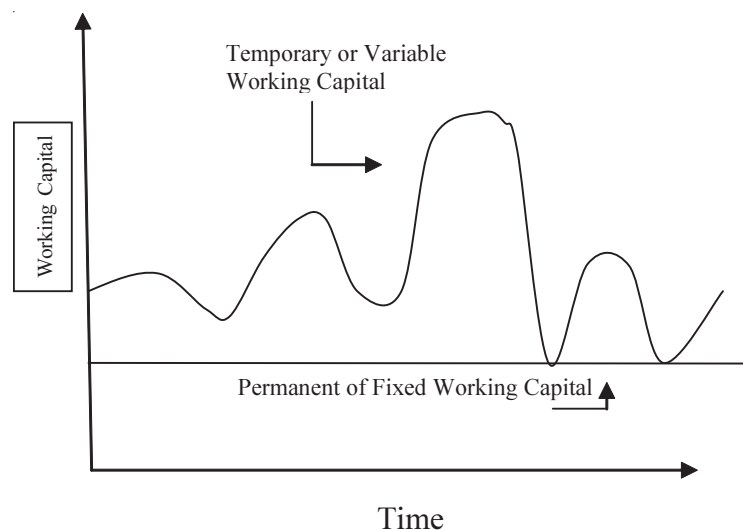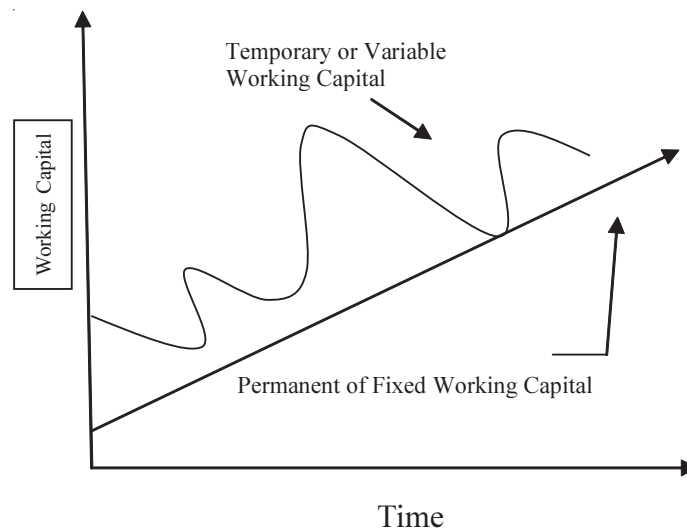
5. **Negative Working Capital**: This situation occurs when the current liabilities exceed the current assets. It is an indication of crisis to the firm.

Need for Working Capital

Working capital is needed till a firm gets cash on sale of finished products. It depends on two factors:

i. Manufacturing cycle *i.e.* time required for converting the raw material into finished product; and

ii. Credit policy *i.e.* credit period given to Customers and credit period allowed by creditors. Thus, the sum total of these times is called an *"Operating cycle"* and it consists of the following six steps:

i. Conversion of cash into raw materials.

ii. Conversion of raw materials into work-in-process.

iii. Conversion of work-in-process into finished products.

iv. Time for sale of finished goods—cash sales and credit sales.

v. Time for realisation from debtors and Bills receivables into cash.

vi. Credit period allowed by creditors for credit purchase of raw materials, inventory and creditors for wages and overheads.

Chart for operating cycle or working capital cycle.
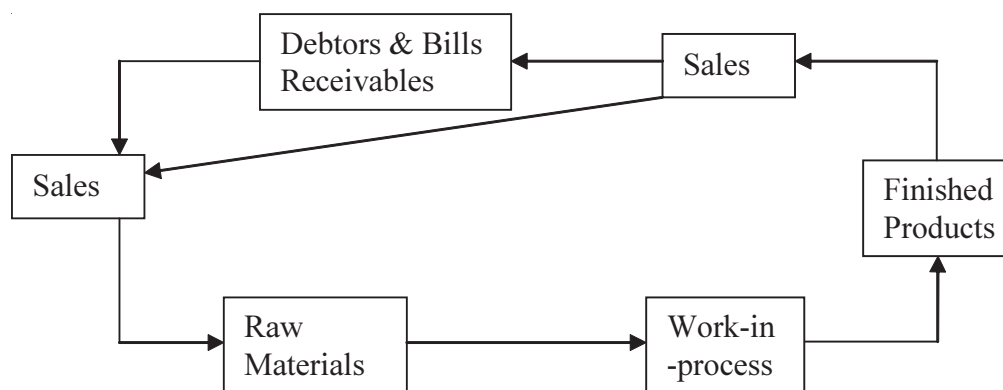
In case of trading concerns, the operating cycle will be:

Cash ⟶ Stock ⟶ Debtors ⟶ Cash.
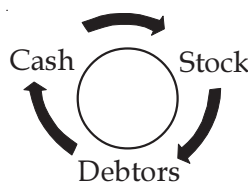
In case of financial concerns, the operating cycle will be:

Cash $\longrightarrow$ Debtors $\longrightarrow$ Cash only.

DETERMINANTS OF WORKING CAPITAL :

The factors influencing the working capital decisions of a firm may be classified as two groups, such as internal factors and external factors. The internal factors includes, nature of business size of business, firm's product policy, credit policy, dividend policy, and access to money and capital markets, growth and expansion of business *etc.* The external factors include business fluctuations, changes in the technology, infrastructural facilities, import policy and the taxation policy *etc.* These factors are discussed in brief in the following lines.

I. Internal Factors

1. Nature and size of the business

The working capital requirements of a firm are basically influenced by the nature and size of the business. Size may be measured in terms of the scale of operations. A firm with larger scale of operations will need more working capital than a small firm. Similarly, the nature of the business - influence the working capital decisions. Trading and financial firms have less investment in fixed assets. But require a large sum of money to be invested in working capital. Retail stores, business units require larger amount of working capital, where as, public utilities need less working capital and more funds to invest in fixed assets.

2. Firm's production policy

The firm's production policy (manufacturing cycle) is an important factor to decide the working capital requirement of a firm. The production cycle starts with the purchase and use of raw material and completes with the production of finished goods. On the other hand production policy is uniform production policy or seasonal production policy etc., also influences the working capital decisions. Larger the manufacturing cycle and uniform production policy – larger will be the requirement of working capital. The working capital requirement will be higher with varying production schedules in accordance with the changing demand.

3. Firm's credit policy

The credit policy of a firm influences credit policy of working capital. A firm following liberal credit policy to all customers require funds. On the other hand, the firm adopting strict credit policy and grant credit facilities to few potential customers will require less amount of working capital.

4. Availability of credit

The working capital requirements of a firm are also affected by credit terms granted by its suppliers – *i.e.* creditors. A firm will need less working capital if liberal credit terms are available to it. Similarly, the availability of credit from banks also influences the working capital needs of the firm. A firm, which can get bank credit easily on favorable conditions will be operated with less working capital than a firm without such a facility.

5. Growth and expansion of business

Working capital requirement of a business firm tend to increase in correspondence with growth in sales volume and fixed assets. A growing firm may need funds to invest in fixed assets in order to sustain its growing production and sales. This will, in turn, increase investment in current assets to support increased scale of operations. Thus, a growing firm needs additional funds continuously.

6. Profit margin and dividend policy

The magnitude of working capital in a firm is dependent upon its profit margin and dividend policy. A high net profit margin contributes towards the working capital pool. To the extent the net profit has been earned in cash, it becomes a source of working capital. This depends upon the dividend policy of the firm. Distribution of high proportion of profits in the form of cash dividends results in a drain on cash resources and thus reduces company's working capital to that extent. The working capital position of the firm is strengthened if the management follows conservative dividend policy and *vice versa.*

7. Operating efficiency of the firm

Operating efficiency means the optimum utilisation of a firm's resources at minimum cost. If a firm successfully controls operating cost, it will be able to improve net profit margin which, will, in turn, release greater funds for working capital purposes.

8. Co-ordinating activities in firm

The working capital requirements of a firm is depend upon the co-ordination between production and distribution activities. The greater and effective the co-ordinations, the pressure on the working capital will be minimized. In the absence of co-ordination, demand for working capital is reduced.

II. External Factors

1. Business fluctuations

Most firms experience fluctuations in demand for their products and services. These business variations affect the working capital requirements. When there is an upward swing in the economy, sales will increase, correspondingly, the firm's investment in inventories and book debts will also increase. Under boom, additional investment in fixed assets may be made by some firms to increase their productive capacity. This act of the firm will require additional funds. On the other hand when, there is a decline in economy, sales will come down and consequently the conditions, the firm try to reduce their short-term borrowings. Similarly the seasonal fluctuations may also affect the requirement of working capital of a firm.

2. Changes in the technology

The technological changes and developments in the area of production can have immediate effects on the need for working capital. If the firm wish to install a new machine in the place of old system, the new system can utilise less expensive raw materials, the inventory needs may be reduced there by working capital needs.

3. Import policy

Import policy of the Government may also effect the levels of working capital of a firm since they have to arrange funds for importing goods at specified times.

4. Infrastructural facilities

The firms may require additional funds to maintain the levels of inventory and other current assets, when there is good infrastructural facilities in the company like, transportation and communications.

5. Taxation policy

The tax policies of the Government will influence the working capital decisions. If the Government follow regressive taxation policy, *i.e.* imposing heavy tax burdens on business firms, they are left with very little profits for distribution and retention purpose. Consequently the firm has to borrow additional funds to meet their increased working capital needs. When there is a liberalised tax policy, the pressure on working capital requirement is minimised.

Thus the working capital requirements of a firm is influenced by the internal and external factors.

MEASUREMENT OF WORKING CAPITAL :

There are 3 methods for assessing the working capital requirement as explained below:

a) Percent of Sales Method

Based on the past experience, some percentage of sale may be taken for determining the quantum of working capital

b) Regression Analysis Method

The relationship between sales and working capital and its various components may be plotted on Scatter diagram and the average percentage of past 5 years may be ascertained. This average percentage of sales may be taken as working capital. Similar exercise may be carried out at the beginning of the year for assessing the working capital requirement. This method is suitable for simple as well as complex situations.

c) Operating Cycle Method

As a first step, we have to compute the operating cycle as follows:

i) *Inventory period*: Number of days consumption in stock = $I \div \dfrac{M}{365}$

Where I – Average inventory during the year
M = Materials consumed during the year

ii) *Work-in-process*: Number of days of work-in-process $= W \div \dfrac{K}{365}$

Where W = Average work-in-process during the year
K = Cost of work-in-process i.e., Material + Labour + Factory overheads.

iii) *Finished products inventory period =* $G \div \dfrac{F}{365}$

Where G = Average finished products inventory during the year

F= Cost of finished goods sold during the year

iv) Average collection period of Debtors = $D \div \dfrac{S}{365}$

Where D = Average Debtors balances during the year

S= Credit sales during the year

v) Credit period allowed by Suppliers = $C \div \dfrac{P}{365}$

Where C= Average creditors' balances during the year

P = credit purchases during the year

vi) Minimum cash balance to be kept daily.

Formula: O.C. = M + W + F + D – C

Note : It is also known as working capital cycle. Operating cycle is the total time gap between the purchase of raw material and the receipt from Debtors.

Importance or Advantages of Adequate Working Capital

Working capital is the life blood and nerve centre of a business. Just as circulation of blood is essential in the human body for maintaining life, working capital is very essential to maintain the smooth running of a business. No business can run successfully without an adequate amount of working capital. The main advantages of maintaining adequate amount of working capital are as follows:

1. **Solvency of the business**: Adequate working capital helps in maintaining solvency of the business by providing uninterrupted flow of production.

2. **Goodwill**: Sufficient working capital enables a business concern to make prompt payments and hence helps in creating and maintaining goodwill.

3. **Easy loans**: A concern having adequate working capital, high solvency and good credit standing can arrange loans from banks and other on easy and favourable terms.

4. **Cash discounts:** Adequate working capital also enables a concern to avail cash discounts on the purchases and hence it reduces costs.

5. **Regular supply of raw materials:** Sufficient working capital ensures regular supply of raw materials and continuous production.

6. **Regular payment of salaries, wages and other day-to-day commitments**: A company which has ample working capital can make regular payment of salaries, wages and other day-to-day commitments which raises the morale of its employees, increases their efficiency, reduces wastages and costs and enhances production and profits.

7. **Exploitation of favourable market conditions**: Only concerns with adequate working capital can exploit favourable market conditions such as purchasing its requirements in bulk when the prices are lower and by holding its inventories for higher prices.

8. **Ability to face crisis**: Adequate working capital enables a concern to face business crisis in emergencies such as depression because during such periods, generally, there is much pressure on working capital.

9. **Quick and regular return on investments:** Every Investor wants a quick and regular return on his investments. Sufficiency of working capital enables a concern to pay quick and regular dividends to its investors as there may not be much pressure to plough back profits. This gains the confidence of its investors and creates a favourable market to raise additional funds i.e., the future.

10. **High morale:** Adequacy of working capital creates an environment of security, confidence, high morale and creates overall efficiency in a business.

Excess or Inadequate Working Capital

Every business concern should have adequate working capital to run its business operations. It should have neither redundant or excess working capital nor inadequate or shortage of working capital. Both excess as well as short working capital positions are bad for any business. However, out of the two, it is the inadequacy of working capital which is more dangerous from the point of view of the firm.

Disadvantages of Redundant or Excessive Working Capital

1. Excessive Working Capital means ideal funds which earn no profits for the business and hence the business cannot earn a proper rate of return on its investments.

2. When there is a redundant working capital, it may lead to unnecessary purchasing and accumulation of inventories causing more chances of theft, waste and losses.

3. Excessive working capital implies excessive debtors and defective credit policy which may cause higher incidence of bad debts.

4. It may result into overall inefficiency in the organization.

5. When there is excessive working capital, relations with banks and other financial institutions may not be maintained.

6. Due to low rate of return on investments, the value of shares may also fall.

7. The redundant working capital gives rise to speculative transactions.

Disadvantages or Dangers of Inadequate Working Capital

1. A concern which has inadequate working capital cannot pay its short-term liabilities in time. Thus, it will lose its reputation and shall not be able to get good credit facilities.

2. It cannot buy its requirements in bulk and cannot avail of discounts, etc.

3. It becomes difficult for the firm to exploit favourable market conditions and undertake profitable projects due to lack of working capital.

4. The firm cannot pay day-to-day expenses of its operations and its creates inefficiencies, increases costs and reduces the profits of the business.

5. It becomes impossible to utilize efficiently the fixed assets due to non-availability of liquid funds.

6. The rate of return on investments also falls with the shortage of working capital.

WORKING CAPITAL FINANCING :

Accruals

The major accrual items are wages and taxes. These are simply what the firm owes to its employees and to the government.

Trade Credit

Trade credit represents the credit extended by the supplier of goods and services. It is a spontaneous source of finance in the sense that it arises in the normal transactions of the firm without specific negotiations, provided the firm is considered creditworthy by its supplier. It is an important source of finance representing 25% to 50% of short-term financing.

Working Capital Advance by Commercial Banks

Working capital advance by commercial banks represents the most important source for financing current assets.

Forms of Bank Finance : Working capital advance is provided by commercial banks in three primary ways: (i) cash credits / overdrafts, (ii) loans, and (iii) purchase / discount of bills. In addition to these forms of direct finance, commercials banks help their customers in obtaining credit from other sources through the letter of credit arrangement.

i. *Cash Credit / Overdrafts:* Under a cash credit or overdraft arrangement, a pre-determined limit for borrowing is specified by the bank. The borrower can draw as often as required provided the out standings do not exceed the cash credit / overdraft limit.

ii. *Loans:* These are advances of fixed amounts which are credited to the current account of the borrower or released to him in cash. The borrower is charged with interest on the entire loan amount, irrespective of how much he draws.

iii. *Purchase / Discount of Bills:* A bill arises out of a trade transaction. The seller of goods draws the bill on the purchaser. The bill may be either clean or documentary (a documentary bill is supported by a document of title to gods like a railway receipt or a bill of lading) and may be payable on demand or after a usance period which does not exceed 90 days. On acceptance of the bill by the purchaser, the seller offers it to the bank for discount / purchase. When the bank discounts / purchases the bill it releases the funds to the seller. The bank presents the bill to the purchaser (the acceptor of the bill) on the due date and gets its payment.

iv. *Letter of Credit:* A letter of credit is an arrangement whereby a bank helps its customer to obtain credit from its (customer's) suppliers. When a bank opens a letter of credit in favour of its customer for some specific purchases, the bank undertakes the responsibility to honour the obligation of its customer, should the customer fail to do so.

Regulation of Bank Finance

Concerned about such a distortion in credit allocation, the Reserve Bank of India (RBI) has been trying, particularly from the mid 1960s onwards, to bring a measure of discipline among industrial borrowers and to redirect credit to the priority sectors of the economy. From time to time, the RBI issues guidelines and directives relating to matters like the norms for inventory and receivables, the maximum permissible bank finance, the form of assistance, the information and reporting system, and the credit monitoring mechanism. The important guidelines and directives have stemmed from the recommendations of various committees such as the Dehejia Committee, the Tandon Committee, the Chore Committee, and the Marathe Committee.

However, in recent years, in the wake of financial liberalisation, the RBI has given freedom to the boards of individual banks in all matters relating to working capital financing.

From the mid-eighties onwards, special committees were set up by the RBI to prescribe norms for several other industries and revise norms for some industries covered by the Tandon Committee.

Maximum Permissible Bank Finance: The Tandon Committee had suggested three methods for determining the maximum permissible bank finance (MPBF).

Lending Norms The recommendation of the Tandon Committee regarding the "Lending norms" has far - reaching implications. The lending norms have been suggested in view of the realization that the banker's role as a lender in only to supplement the borrower's resources and not to meet his entire working capitals needs. In the context of this approach, the committee has suggested three alternative methods for working out the maximum permissible level of bank borrowings. Each successive method reduces the involvement of short-term bank credit to finance the current assets.

First Method: According to this method, the borrower will have to contribute a minimum of 25% of the working capital gap from long-term funds, i.e., owned funds and term borrowings. This will give a current ratio of 1.17:1.

The term working capital gap refers to the total of current assets less current liabilities other than bank borrowings. This can be understood with the help of following example:

Example 1

	Rs.
Total Current assets required by the borrower as per norms	20,000
Current liabilities	5,000
Amount of maximum permissible bank borrowings as per the first method can be ascertained as follows: -	
Working Capital gap (Rs. 20,000 – Rs. 5,000)	15,000
Less: 25% from long-term sources	3,750
Maximum permissible bank borrowings	11,250

Second Method: Under this method the borrower has to provide the minimum of 25% of the total current assets that will give a current ratio of 1.33:1.

Example 2: On the basis of the data given in Example 1, the maximum permissible bank borrowings as per second method can be ascertained as follows:

	Rs.
Current assets as per norms	20,000
Less: 25% to be provided from long – term funds	5,000
	15,000
Less: Current liabilities other than bank borrowings	5,000
Maximum permissible bank borrowings	10,000

Third Method : In this method, the borrower's contribution from long term funds will be to the extent of the entire core current assets and a minimum of 25% of the balance of the current assets. The term core current assets refers to the absolute minimum level of investment in all current assets which is required at all times to carry out minimum level of business activities.

Example 3 : On the basis of the information given in Example 1, the amount of maximum permissible bank finance can be arrived at the follows if the core current assets are Rs. 2,000

	Rs.
Current assets as per norms	20,000
Less: Core Current Assets	2,000
	18,000
Less: 25% to be provided from long-term funds	4,500
	13,500
Less: Current Liabilities	5,000
Maximum permissible bank borrowings	8,500

It will thus be seen that in the third method current ratio has further improved.

Reserve Bank's directive : The Reserve Bank of India accepted the recommendations of the Tandon Committee. It instructed the commercial banks in 1976 to put all the borrowers having aggregate credit limits from banking system in excess of Rs. 10 lakhs, under the first method of lending.

Public Deposits

Many firms, large and small, have solicited unsecured deposits from the public in recent years, mainly to finance their working capital requirements.

Inter-corporate Deposits

A deposit made by one company with another, normally for a period up to six months, is referred to as an inter-corporate deposit. Such deposits are usually of three types.

a. *Call Deposits :* In theory, a call deposit is withdrawable by the lender on giving a day's notice. In practice, however, the lender has to wait for at least three days. The interest rate on such deposits may be around 10 percent per annum.

b. *Three-months Deposits :* More popular in practice, these deposits are taken by borrowers to tide over a short-term cash inadequacy that may be caused by one or more of the following factors: disruption in production, excessive imports of raw material, tax payment, delay in collection, dividend payment, and unplanned capital expenditure. The interest rate on such deposits is around 12 percent per annum.

c. *Six-months Deposits :* Normally, lending companies do not extend deposits beyond this time frame. Such deposits, usually made with first-class borrowers, and carry interest rate of around 15 percent per annum.

Short-term Loans from Financial Institutions

The Life Insurance Corporation of India and the General Insurance Corporation of India provide short-term loans to manufacturing companies with an excellent track record.

Rights Debentures for Working Capital

Public limited companies can issue "Rights" debentures to their shareholders with the object of augmenting the long-term resources of the company for working capital requirements. The key guidelines applicable to such debentures are as follows:

i.   The amount of the debenture issue should not exceed (a) 20% of the gross current assets, loans, and advances minus the long-term funds presently available for financing working capital, or (b) 20% of the paid-up share capital, including preference capital and free reserves, whichever is the lower of the two.

ii. The debt. -equity ratio, including the proposed debenture issue, should not exceed 1:1.

iii. The debentures shall first be offered to the existing Indian resident shareholders of the company on a pro rata basis.

Commercial Paper

Commercial paper represents short-term unsecured promissory notes issued by firms which enjoy a fairly high credit rating. Generally, large firms with considerable financial strength are able to issue commercial paper. The important features of commercial paper are as follows:

i.   The maturity period of commercial paper usually ranges from 90 days to 360 days.

ii. Commercial paper is sold at a discount from its face value and redeemed at its face value. Hence the implicit interest rate is a function of the size of the discount and the period of maturity.

iii. Commercial paper is directly placed with investors who intend holding it till its maturity. Hence there is no well developed secondary market for commercial paper.

Factoring

Factoring, as a fund based financial service, provides resources to finance receivables as well as facilitates the collection of receivables. It is another method of raising short-term finance through account receivable credit offered by commercial banks and factors. A commercial bank may provide finance by discounting the bills or invoices of its customers. Thus, a firm gets immediate payment for sales made on credit. A factor is a financial institution which offers services relating to management and financing of debts arising out of credit sales. Factoring is becoming popular all over the world on account of various services offered by the institutions engaged in it. Factors render services varying from bill discounting facilities offered by commercial banks to a total take over of administration of credit sales including maintenance of sales ledger, collection of accounts receivables, credit control and protection from bad debts, provision of finance and rendering of advisory services to their clients. Factoring, may be on a recourse basis, where the risk of bad debts is borne by the client, or on a non-recourse basis, where the risk of credit is borne by the factor.

At present, factoring in India is rendered by only a few financial institutions on a recourse basis. However, the Report of the Working Group on Money Market (Vaghul Committee) constituted by the Reserve Bank of India has recommended that banks should be encouraged to set up factoring divisions to provide speedy finance to the corporate entities.

Inspite of many services offered by factoring, it suffers from certain limitations. The most critical fall outs of factoring include (i) the high cost of factoring as compared to other sources of short-term finance, (ii) the perception of financial weakness about the firm availing factoring services, and (iii) adverse impact of tough stance taken by factor, against a defaulting buyer, upon the borrower resulting into reduced future sales.

Financing and Policies of Working Capital, and their Impact

After arriving the estimation of working capital for any firm, the next step is how to finance the working capital requirement. It is of two sources of financing:

   i) Short –term

   ii) Long – term

Short-term financing refers to borrowing funds or raising credit for a maximum of 1 year period i.e., the debt is payable within a year at the most. Whereas, the Long – term financing refers to the borrowing of funds or raising credit for one year or more. The finance manager has to mix funds from these two sources optimally to ensure profitability and liquidity. The mixing of finances from long-term and short term should be such that the firm should not face either short of funds or idle funds. Thus, the financing of working capital should not result in either idle or shortage of cash funds.

Policy is a guideline in taking decisions of business. In working capital financing, the manager has to take a decision of mixing the two components i.e., long term component of debt and short term component of debt. The policies for financing of working capital are divided into three categories. Firstly, conservative financing policy in which the manager depends more on long term funds. Secondly, aggressive financing policy in which the manager depends more on short term funds, and third, are is a moderate policy which suggests that the manager

depends moderately on both long tem and short-term funds while financing. These policies are shown diagrammatically here under.

	Seasonal Current Assets	Short Term funds
Conservative Financing Policy	Permanent Current Assets	Long term funds +
	Fixed Assets	Equity Capital

	Seasonal Current Assets	Short Term funds
Aggressive Financing Policy	Permanent Current Assets	Long term funds +
	Fixed Assets	Equity Capital

	Seasonal Current Assets	Short Term funds
Moderate Financing Policy	Permanent Current Assets	Long term funds +
	Fixed Assets	Equity Capital

Working Capital Policies

Matching Approach

The question arising here is how to mix both short term and long term funds while financing required working capital. The guiding approach is known as 'matching approach'. It suggests that if the need is short term purpose, raise short – term loan or credit and if the need is for a long term, one should raise long term loan or credit. Thus, maturity period of the loan is to be matched with the purpose and for how long. This is called matching approach. This matches the maturity period of the loan with the period for how long working capital requires. The following diagram shows the graphic presentation of the matching approach.

Matching Approach
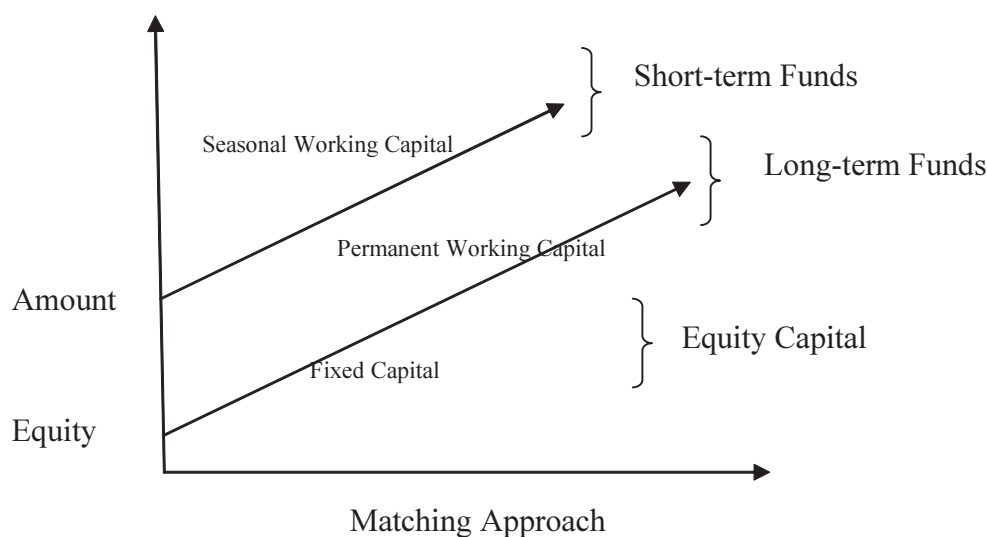
Types of Funds		Working capital requirement
Short – term	-	Seasonal Working Capital
Long – term	-	Permanent Working Capital
Equity Capital	-	Fixed Assets

Impact of Working Capital Policies

A firm's sales are Rs. 25 lakhs, and having an EBIT – Rs. 3 lakhs. It has fixed assets of Rs. 8 lakhs. The firm is thinking to hold current assets of different size of Rs. 5 lakhs; Rs. 6 lakhs or Rs. 8 lakhs. Assuming profits and fixed assets do not vary, the impact of these working capital policies are in the following manner which is explained is a hypothetical illustration :

	Types of Policy (Rs. in lakhs)		
	Aggressive	Moderate	Conservative
Sales	25	25	25
EBIT	3	3	3
Current Assets	5	6	8
Fixed Assets	8	8	8
Total Assets	13	14	16
Return on Assets % (EBIT/total assets)	23.07	21.42	18.75

Lower the level of current assets (aggressive) higher the returns (23.07 percent) higher the level of current assets (conservative) lower the returns (18.75 percent).

Optimal Size of Current Assets

As we have discussed in the earlier paragraphs, current assets and their size depends upon several factors. Arriving appropriate size of current assets such as cash, raw materials, finished goods and debtors is a challenge to the financial manager of a firm. It happens some times excess or shortage. We have also discussed in the fore-gone paragraphs about the evils of excess working capital and inadequate working capital. Very few firms arrive optimum level of working capital by their sheer experience and scientific approach. The ratio of current assets to fixed assets helps in measuring the performance of working capital management. The higher the ratio, conservative the firm is in maintaining its current assets and lower the ratio, aggressive the firm is in maintaining its current assets. So every firm should balance their level of current assets and make it optimum.

Liquidity Vs. Profitability

Any exercise in working capital management will influence either liquidity or profitability. The working capital management is a razor edge exercise for financial manager of an enterprise. In this context the financial manager has to take several decisions of routine and non-routine such as:

Sufficient cash balance to be maintained;

To raise long term or short term loans decide the rate of interest and the time of repayment; Decide the purchase policy to buy or not to buy materials;

To determine the economic order quantity for inputs,

To fix the price at which to buy the inputs if any;

To sell for credit or not and terms of credit;

To decide the terms of purchase;

To decide the credit period and extent of credit;

In all these aspects the financial manager has to take decisions carefully so that the firm's twin objectives such as profitability and solvency are not affected.

Trade off between Liquidity and Profitability

If a firm maintains huge amount of current assets its profitability will be affected though it protects liquidity. If a firm maintains low current assets, its liquidity is of course weak but the firm's profitability will be high. The trade off between liquidity and illiquidity are shown in the following diagram.
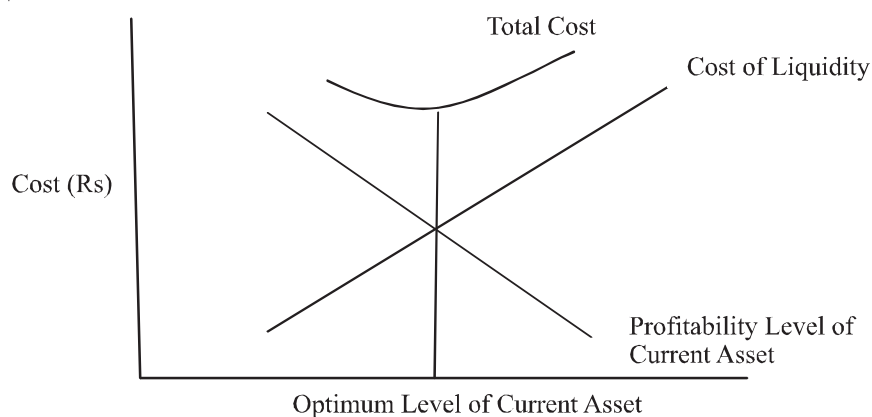
A Trade off between Profitability and Liquidity

MANAGEMENT OF WORKING CAPITAL :

Working Capital Management involves management of different components of working capital such as cash, inventories, accounts receivable, creditors etc. A brief description follows regarding the various issues involved in the management of each of the above components of working capital.

INVENTORY MANAGEMENT :

Inventory constitutes an important item in the working capital of many business concerns. Net working capital is the difference between current assets and current liabilities. Inventory is a major item of current assets. The term inventory refers to the stocks of the product of a firm is offering for sale and the components that make up the product Inventory is stores of

goods and stocks. This includes raw materials, work-in-process and finished goods. Raw materials consist of those units or input which are used to manufactured goods that require further processing to become finished goods. Finished goods are products ready for sale. The classification of inventories and the levels of the components vary from organisaion to organisation depending upon the nature of business. For example steel is a finished product for a steel industry, but raw material for an automobile manufacturer. Thus, inventory may be defined as "Stock of goods that is held for future use". Since inventories constitute about 50 to 60 percent of current assets, the management of inventories is crucial to successful working capital management. Working capital requirements are influenced by inventory holding. Hence, the need for effective and efficient management of inventories.

A good inventory management is important to the successful operations of most organisaions, unfortunately the importance of inventory is not always appreciated by top management. This may be due to a failure to recognise the link between inventories and achievement of organisational goals or due to ignorance of the impact that inventories can have on costs and profits.

Inventory management refers to an optimum investment in inventories. It should neither be too low to effect the production adversely nor too high to block the funds unnecessarily. Excess investment in inventories is unprofitable for the business. Both excess and inadequate investment in inventories are not desirable. The firm should operate within the two danger points. The purpose of inventory management is to determine and maintain the optimum level of inventory investment.

Techniques of Inventory Control

The following are the various measures of selective control of inventory :

A. Economic Ordering Quantity (EOQ)

It is important to note that only the correct quantity of materials is to be purchased. For this purpose, the factors such as maximum level, minimum level, danger level, re-ordering level, quantity already on order, quantity reserved, availability of funds, quantity discount, interest on capital, average consumption and availability of storage accommodation are to be kept in view. There should not be any over stock vis-à-vis no question of non-stock. Balance should be made between the cost of carrying and cost of non-carrying *i.e.* cost of stock-out. Cost of carrying includes the cost of storage, insurance, obsolescence, interest on capital invested. Cost of not carrying includes the costly purchase, loss of production and sales and loss of customer's goodwill. Economic Ordering Quantity (EOQ) is the quantity fixed at the point where the total cost of ordering and the cost of carrying the inventory will be the minimum. If the quantity of purchases is increased, the cost of ordering decreases while the cost of carrying increases. If the quantity of purchases is decreased, the cost of ordering increases while the cost of carrying decreases. But in this case, the total of both the costs should be kept at minimum. Thus, EOQ may be arrived at by Tabular method by preparing purchase order quantity tables showing the ordering cost, carrying cost and total cost of various sizes of purchase orders.

Graph. EOQ : Behaviour of Ordering and Carrying Costs.
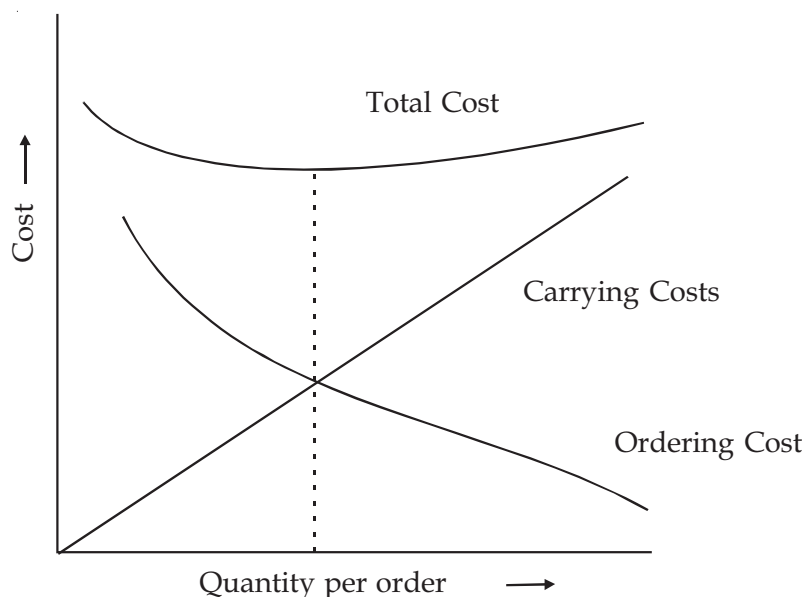
Economic Ordering Quantity may also be worked out mathematically by using the following formula:

$$EOQ = \sqrt{\frac{2 \times Annual\ usage \times Buying\ Cost}{Cost\ of\ Carrying\ of\ One\ Unit\ expressed\ as\ perecentage}}$$

$$EOQ = \sqrt{\frac{2AB}{C}}$$

Note: Buying Cost is the ordering cost.

B. Fixing levels (Quantity Control) - For fixing the various levels such as maximum, minimum, *etc.*, average consumption and lead time *i.e.* the average time taken between the initiation of purchase order and the receipt of materials from suppliers are to be estimated for each item of materials.

a. Maximum Stock Level - The maximum stock level is that quantity above which stocks should not normally be allowed to exceed. The following factors are taken into consideration while fixing the maximum stock level:

1. Average rate of consumption of material.

2. Lead time.

3. Re-order level.

4. Maximum requirement of materials for production at any time.

5. Storage space available, cost of storage and insurance.

6. Financial consideration such as price fluctuations, availability of capital, discounts due to seasonal and bulk purchases, etc.

7. Keeping qualities *e.g.* risk of deterioration, obsolescence, evaporation, depletion and natural waste, etc.

8. Any restrictions imposed by local or national authority in regard to materials *i.e.* purchasing from small scale industries and public sector undertakings, price preference clauses, import policy, explosion in case of explosive materials, risk of fire, etc.; and

9. Economic ordering quantity is also considered.

Formula

Maximum Level = Re-order level — (Minimum consumption) × (Minimum lead times) + Reordering quantity

b. Minimum Stock Level - The minimum stock level is that quantity below which stocks should not normally be allowed to fall. If stocks go below this level, there will be danger of stoppage of production due to shortage of supplies. The following factors are taken into account while fixing the minimum stock level:

1. Average rate of consumption of material.

2. Average lead time. The shorter the lead time, the lower is the minimum level.

3. Re-order level.

4. Nature of the item.

5. Stock out cost.

Formula

Minimum Level = Re-order level – (Average usage × Average lead time)

c. Re-order Level - This is the point fixed between the maximum and minimum stock levels and at this time, it is essential to initiate purchase action for fresh supplies of the material. In order to cover the abnormal usage of material or unexpected delay in delivery of fresh supplies, this point will usually be fixed slightly higher than the minimum stock level. The following factors are taken into account while fixing the re-order level:

     1. Maximum usage of materials

     2. Maximum lead time

     3. Maximum stock level

     4. Minimum stock level

Formula

Re-order level = Maximum usage X Maximum lead time or Minimum level + Consumption

during lead time.

Re-ordering Quantity (How much to purchase): It is also called Economic Ordering Quantity.

d. Danger Level - This is the level below the minimum stock level. When the stock reaches this level, immediate action is needed for replenishment of stock. As the normal lead time is not available, regular purchase procedure cannot be adopted resulting in higher purchase cost. Hence, this level is useful for taking corrective action only. If this is fixed below the re-order level and above the minimum level, it will be possible to take preventive action.

C. ABC Analysis for value of items consumed

ABC Analysis for Inventory Control: ABC analysis is a method of material control according to value. The basic principle is that high value items are more closely controlled than the low value items. The materials are grouped according to the value and frequency of replenishment during a Period.

'A' Class items: Small percentage of the total items but having higher values.

'B' Class items: More percentage of the total items but having medium values.

'C' Class items: High percentage of the total items but having low values.

Illustration :

A manufacturing concern is having 1,000 units of materials valuing Rs. 1,00,000 in total. Prepare the statement showing the stock according to ABC Analysis.

	Quantity		Value		Average values Rs.
Category	%	No. of items	%	Amount	
A (High value items)	10%	100	70%	70,000	70,000 ÷ 100 = 700
B (Medium value items)	20%	200	20%	20,000	20,000 ÷ 100 = 200
C (Low value items)	70%	700	10%	10,000	10,000 ÷ 700 = 14
Total:	100%	1000	100%	1,00,000	

For the sake of simplicity, the above percentage has been considered. But in practice, the percentage may vary between 5% to 10%, 10% to 20% and 70% to 85%.
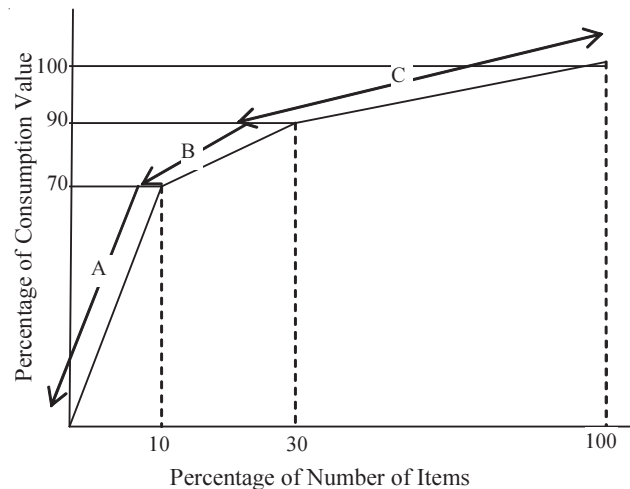
In foreign countries, Bin Cards and Stores Ledger Cards are not maintained for 'C' class items. These are issued directly to the production foreman concerned and controlled through norms of consumption based on production targets. By doing this, 70% of the effort required for maintaining the Bin Cards and Stores Ledger Cards is eliminated. With 30% of the effort, an organization will be able to exercise control on the 90% of the inventory values. This reduces the clerical costs and ensures the closer control on costly items in which large amount of capital is invested.

The general procedure for classifying A, B or C items is as follows :

1. Ascertain the cost and consumption of each material over a given period of time.

2. Multiply unit cost by estimated usage to obtain net value.

3. List out all the items with quantity and value.

4. Arrange them in descending order in value i.e., ranking according to value.

5. Ascertain the monetary limits for A, B or C classification.

6. Accumulate value and add up number of items of A items. Calculate percentage on total inventory in value and in number.

7. Similar action for B and C class items.

Advantages of ABC Analysis

1. To minimize purchasing cost and carrying cost (i.e. holding cost).

2. Closer and stricter control on these items which represent a high portion of total stock value.

3. Ensuring availability of supplies at all times.

4. Clerical costs can be reduced.

5. Inventory is maintained at optimum level and thereby investment in Inventory can be regulated and will be minimum. 'A; items will be ordered more frequently and as such the investment in inventory is reduced.

6. Maintaining enough safety stock for 'C' items.

7. Equal attention to A, B and C items is not desirable as it is expensive.

8. It is based on the concept of Selective Inventory Management and it helps in maintaining high stock-turnover ratio.

A. Perpetual Inventory System

The Institute of Cost and Management Accountants, London defines the perpetual inventory system as "A system of records maintained by the controlling department, which reflects physical movements of stocks and their current balance."

This system consists of the following three:

a. Bin cards *i.e.* Quantitative Perpetual Inventory.

b. Stores ledger *i.e.* Quantitative and Value Perpetual Inventory.

c. Continuous Stock taking *i.e.* Physical Perpetual Inventory.

B. H.M.L. Classification

In ABC analysis, the consumption value of items has been taken into account. But in this case, the unit value of stores items is considered. The materials are classified according to their unit value as high, medium or low valued items. Combining ABC analysis and HML classification, it will be more useful to an organisation in the sense that the low value components having substantial consumption, that is to say, a small item costing Re. 1 each consumed a lakh numbers will cost Rs.1.00 lakh which is quite high and it is to be controlled properly.

C. F S N Analysis

According to this approach, the inventory items are categorized into 3 types. They are fast moving, slow moving and non moving. Inventory decisions are very carefully taken in the case of 'non moving category'. In the case of item of fast moving items, the manager can take decisions quite easily because any error happened will not trouble the firm so seriously. Since risk is less in fast moving items, because they can be consumed quickly unlike the non- moving category which are carried in the godowns for more time period.

As risk is high in case of slow – moving and non – moving – items, the inventory decisions have to be taken carefully without affecting the objectives of profitability and liquidity of the organisation.

D. V.E.D. Classification

The V.E.D. classification is applicable mainly to the spare parts. Spares are classified as vital (V), essential (E) and desirable (D). Vital class spares have to be stocked adequately to ensure the operations of the plant but some risk can be taken in the case of 'E' class spares. Stocking of desirable spares can even be done away with if the lead time for their procurement is low.

Similarly, classification may be done in respect of the plant and machinery as vital, essential, important and normal (VEIN). If the classifications VED and VEIN are combined, there will be 12 different classes as follows:

Vital spares for vital plant, vital spares for essential plant, vital spares for important plant and vital spares for normal plant. Essential spares for essential plant, essential spares for important plant, essential spares for normal plant and essential spares for vital plant, Desirable spares for essential plant, desirable spares for important plant, desirable spares in vital plant and desirable spares for normal plant.

E. Just in Time (JIT)

Normally, inventory costs are high and controlling inventory is complex because of uncertainities in supply, dispatching, transportation etc. Lack of coordination between suppliers and ordering firms is causing severe irregularities, ultimately the firm ends-up in inventory problems. Toyota Motors has first time suggested just – in – time approach in 1950s. This means the material will reach the points of production process directly form the suppliers as per the time schedule. It is possible in the case of companies with respective process. Since, it requires close coordination between suppliers and the ordering firms, and therefore, only units with systematic approach will be able to implement it.

F. Inventory Turnover Ratio

i) Inventory Turnover Ratio: Cost of goods sold / average total inventories. The higher the ratio, more the efficiency of the firm

ii) Work in process turnover ratio = $\dfrac{\text{Cost of goods sold}}{\text{Average inventory of finished goods at costs}}$

Here, in this ratio also higher the ratio, more the efficiency of the firm.

iii) Weeks inventory of finished goods on hand $\rightarrow \dfrac{\text{Finished Goods}}{\text{Weekly sales of finished goods}}$

The ratio reveals that the lower the ratio, the higher the efficiency of the firm

iv) Weeks raw material on order $\rightarrow \dfrac{\text{Raw material on order}}{\text{Weekly consumption of raw material}}$

This ratio indicates that the lower the ratio, the higher the efficiency of the firm.

v) Average age of raw material inventory $\rightarrow \dfrac{\text{Average raw material inventory at cost}}{\text{Average daily purchases of raw material}}$

This ratio says that the lower the ratio the higher the efficiency of the firm.

vi) Average age of finished goods inventory

$\rightarrow \dfrac{\text{Average finished goods inventory at cost}}{\text{Average cost of finished goods manufactured per day}}$

This ratio indicates that the lower the ratio the higher the efficiency of the firm.

i) Out of stock index → $\dfrac{\text{No. of times out of stock}}{\text{No. of items requisitioned}}$

This ratio indicates the lower the ratio higher the efficiency of the firm.

ii) Spare parts index → $\dfrac{\text{Value of spare parts inventory}}{\text{Value of capital equipment}}$

This ratio reveals that the higher the ratio the more the efficiency of the firm.

CASH MANAGEMENT :

Cash management is one of the key areas of working capital management. Cash is the most liquid current assets. Cash is the common denominator to which all current assets can be reduced because the other major liquid assets, *i.e.* receivable and inventory get eventually converted into cash. This underlines the importance of cash management.

The term "Cash" with reference to management of cash is used in two ways. In a narrow sense cash refers to coins, currency, cheques, drafts and deposits in banks. The broader view of cash includes near cash assets such as marketable securities and time deposits in banks. The reason why these near cash assets are included in cash is that they can readily be converted into cash. Usually, excess cash is invested in marketable securities as it contributes to profitability.

Cash is one of the most important components of current assets. Every firm should have adequate cash, neither more nor less. Inadequate cash will lead to production interruptions, while excessive cash remains idle and will impair profitability. Hence, the need for cash management. The cash management assumes significance for the following reasons.

Significance

1. *Cash planning* - Cash is the most important as well as the least unproductive of all current assets. Though, it is necessary to meet the firm's obligations, yet idle cash earns nothing. Therefore, it is essential to have a sound cash planning neither excess nor inadequate.

2. *Management of cash flows* - This is another important aspect of cash management. Synchronisation between cash inflows and cash outflows rarely happens. Sometimes, the cash inflows will be more than outflows because of receipts from debtors, and cash sales in huge amounts. At other times, cash outflows exceed inflows due to payment of taxes, interest and dividends *etc.* Hence, the cash flows should be managed for better cash management.

3. *Maintaining optimum cash balance* - Every firm should maintain optimum cash balance. The management should also consider the factors determining and influencing the cash balances at various point of time. The cost of excess cash and danger of inadequate cash should be matched to determine the optimum level of cash balances.

4.   *Investment of excess cash* - The firm has to invest the excess or idle funds in short term securities or investments to earn profits as idle funds earn nothing. This is one of the important aspects of management of cash.

Thus, the aim of cash management is to maintain adequate cash balances at one hand and to use excess cash in some profitable way on the other hand.

Motives

Motives or desires for holding cash refers to various purposes. The purpose may be different from person to person and situation to situation. There are four important motives to hold cash.

a.   *Transactions motive* - This motive refers to the holding of cash, to meet routine cash requirements in the ordinary course of business. A firm enters into a number of transactions which requires cash payment. For example, purchase of materials, payment of wages, salaries, taxes, interest *etc.* Similarly, a firm receives cash from cash sales, collections from debtors, return on investments *etc.* But the cash inflows and cash outflows do not perfectly synchronise. Sometimes, cash receipts are more than payments while at other times payments exceed receipts. The firm must have to maintain sufficient (funds) cash balance if the payments are more than receipts. Thus, the transactions motive refers to the holding of cash to meet expected obligations whose timing is not perfectly matched with cash receipts. Though, a large portion of cash held for transactions motive is in the form of cash, a part of it may be invested in marketable securities whose maturity conform to the timing of expected payments such as dividends, taxes *etc.*

b.   *Precautionary motive* - Apart from the non-synchronisation of expected cash receipts and payments in the ordinary course of business, a firm may be failed to pay cash for unexpected contingencies. For example, strikes, sudden increase in cost of raw materials *etc.* Cash held to meet these unforeseen situations is known as precautionary cash balance and it provides a caution against them. The amount of cash balance under precautionary motive is influenced by two factors *i.e.* predictability of cash flows and the availability of short term credit. The more unpredictable the cash flows, the greater the need for such cash balances and *vice versa.* If the firm can borrow at short-notice, it will need a relatively small balance to meet contingencies and *vice versa.* Usually precautionary cash balances are invested in marketable securities so that they contribute something to profitability.

c.   *Speculative motive* - Sometimes firms would like to hold cash in order to exploit, the profitable opportunities as and when they arise. This motive is called as speculative motive. For example, if the firm expects that the material prices will fall, it can delay the purchases and make purchases in future when price actually declines. Similarly, with the hope of buying securities when the interest rate is expected to decline, the firm will hold cash. By and large, firms rarely hold cash for speculative purposes.

d.   *Compensation motive* - This motive to hold cash balances is to compensate banks and other financial institutes for providing certain services and loans. Banks provide a variety of services to business firms like clearance of cheques, drafts, transfer of funds

etc. Banks charge a commission or fee for their services to the customers as indirect compensation. Customers are required to maintain a minimum cash balance at the bank. This balance cannot be used for transaction purposes. Banks can utilise the balances to earn a return to compensate their cost of services to the customers. Such balances are compensating balances. These balances are also required by some loan agreements between a bank and its customers. Banks require a chest to maintain a minimum cash balance in his account to compensate the bank when the supply of credit is restricted and interest rates are rising.

Thus cash is required to fulfill the above motives. Out of the four motives of holding cash balances, transaction motive and compensation motives are very important. Business firms usually do not speculate and need not have speculative balances. The requirement of precautionary balances can be met out of short-term borrowings.

Objectives

The basic objectives of cash management are

(i) to make the payments when they become due and

(ii) to minimize the cash balances. The task before the cash management is to reconcile the two conflicting nature of objectives.

1.   **Meeting the payments schedule -** The basic objective of cash management is to meet the payment schedule. In the normal course of business, firms have to make payments of cash to suppliers of raw materials, employees and so on regularly. At the same time firm will be receiving cash on a regular basis from cash sales and debtors. Thus, every firm should have adequate cash to meet the payments schedule. In other words, the firm should be able to meet the obligations when they become due.

The firm can enjoy certain advantages associated with maintaining adequate cash. They are:

a. *Insolvency* - The question of insolvency does not arise as the firm will be able to meet its obligations.

b. *Good relations* - Adequate cash balance in the business firm helps in developing good relations with creditors and suppliers of raw materials.

c. *Credit worthiness* - The maintenance of adequate cash balances increase the credit worthiness of the firm. Consequently it will be able to purchase raw materials and procure credit with favorable terms and conditions.

d. *Availing discount facilities* - The firm can avail the discounts offered by the creditors for payments before the due date.

e. *To meet unexpected facilities* - The firm can easily meet the unexpected cash expenditure in situations like strikes, competition from customers *etc.* with little strain.

So, every firm should have adequate cash balances for effective cash management.

2. **Minimising funds committed to cash balances -** The second important objective of cash management is to minimise cash balance. In minimizing the cash balances two conflicting aspects have to be reconciled. A high level of cash balances will ensure prompt payment together with all advantages, but at the same time, cash is a non-earning asset and the larger balances of cash impair profitability. On the other hand, a low level of cash balance may lead to the inability of the firm to meet the payment schedule. Thus the objective of cash management would be to have an optimum cash balance.

Factors determining cash needs - Maintenance of optimum level of cash is the main problem of cash management. The level of cash holding differs from industry to industry, organisation to organisation. The factors determining the cash needs of the industry is explained as follows:

i. *Matching of cash flows* - The first and very important factor determining the level of cash requirement is matching cash inflows with cash outflows. If the receipts and payments are perfectly coincide or balance each other, there would be no need for cash balances. The need for cash management therefore, due to the non-synchronisation of cash receipts and disbursements. For this purpose, the cash inflows and outflows have to be forecast over a period of time say 12 months with the help of cash budget. The cash budget will pin point the months when the firm will have an excess or shortage of cash.

ii. *Short costs* - Short costs are defined as the expenses incurred as a result of shortfall of cash such as unexpected or expected shortage of cash balances to meet the requirements. The short costs includes, transaction costs associated with raising cash to overcome the shortage, borrowing costs associated with borrowing to cover the shortage *i.e.* interest on loan, loss of trade-discount, penalty rates by banks to meet a shortfall in compensating, cash balances and costs associated with deterioration of the firm's credit rating *etc.* which is reflected in higher bank charges on loans, decline in sales and profits.

iii. *Cost of cash on excess balances* - One of the important factors determining the cash needs is the cost of maintaining cash balances *i.e.* excess or idle cash balances. The cost of maintaining excess cash balance is called excess cash balance cost. If large funds are idle, the implication is that the firm has missed opportunities to invest and thereby lost interest. This is known as excess cost. Hence the cash management is necessary to maintain an optimum balance of cash.

iv. *Uncertainty in business* - Uncertainty plays a key role in cash management, because cash flows can not be predicted with complete accuracy. The first requirement of cash management is a precautionary cushion to cope with irregularities in cash flows, unexpected delays in collections and disbursements, defaults and expected cash needs the uncertainty can be overcome through accurate forecasting of tax payments, dividends, capital expenditure *etc.* and ability of the firm to borrow funds through over draft facility.

v. *Cost of procurement and management of cash* - The costs associated with establishing and operating cash management staff and activities determining the cash needs of a business firm. These costs are generally fixed and are accounted for by salary, storage and handling of securities *etc.* The above factors are considered to determine the cash needs of a business firm.

The Strategies for Cash Management are Discussed in Detail in the Following Lines

I)   **Projection of cash flows and planning** - The cash planning and the projection of cash flows is determined with the help of cash budget. The cash budget is the most important tool in cash management. It is a device to help a firm to plan and control the use of cash. It is a statement showing the estimated cash inflows and cash outflows over the firm's planning horizon. In other words the net cash position i.e., surplus or deficiency of a firm is highlighted by the cash budget from one budgeting period to another period.

II) **Determining optimal level of cash holding in the company** - One of the important responsibilities of a finance manager is to maintain sufficient cash balances to meet the current obligations of a company. Determining to optimum level of cash balance influenced by a trade off between risk and profitability. Every business enterprise holding cash balances for transaction purposes and to meet precautionary, speculative and compensative motives. With the help of cash budget the finance manager predicts the inflows and outflows of cash during a particular period of time and there by determines the cash requirements of the company. While determining the optimum level of cash balance (neither excess nor inadequate cash balances) the finance manager has to bring a trade off between the liquidity and profitability of the firm. The optimum level of cash balances of a company can be determined in various ways : They are

   a)   Inventory model (Economic Order Quantity) to cash management

   b)   Stochastic model

   c)   Probability model

   A) **Inventory model (EOQ) to cash management** - Economic Order Quantity (EOQ) model is used in determination of optimal level of cash of a company. According to this model optimal level of cash balance is one at which cost of carrying the inventory of cash and cost of going to the market for satisfying cash requirements is minimum. The carrying cost of holding cash refers to the interest foregone on marketable securities where as cost of giving to the market means cost of liquidating marketable securities in cash.

   Optimum level of cash balance can be determined as follows:

   $$Q = \sqrt{\frac{2AO}{C}}$$

   Where Q = Optimum level of cash inventory

   A = Total amount of transaction demand

   O = Average fixed cost of securing cash from the market (ordering cost of cash / securities)

C = Cost of carrying cash inventory, i.e., interest rate on marketable securities for the period involved.

Assumptions : The model is based on the following assumptions:

1) The demand for cash, transactions costs of obtaining cash and the holding costs for a particular period are given and do not change during that period.

2) There is a constant demand for cash during the period under consideration.

3) Cash payments are predictable

4) Banks do not impose any restrictions on firms with respect of maintenance of minimum cash balances in the bank accounts.

For example : Teja & Company estimated cash payments of Rs. 36,000 for a period of 30 days. The average fixed cost for securing capital from the market (ordering cost) is Rs. 100 and the carrying cost or interest rate on marketable securities is 12% per annum. Determine the optimum quantity of cash balance?

A = Monthly requirement = Rs. 36,000

O = Fixed Cost for securing capital = Rs. 100

C = Cost of interest on marketable securities = 12% per year

Per month: 1% or (0.1)

Therefore: $Q = \sqrt{\dfrac{2AO}{C}} = \sqrt{\dfrac{2(36,000 \times 100)}{0.1}}$

Optimum transaction of cash: Rs. 8,485.28

Graphically
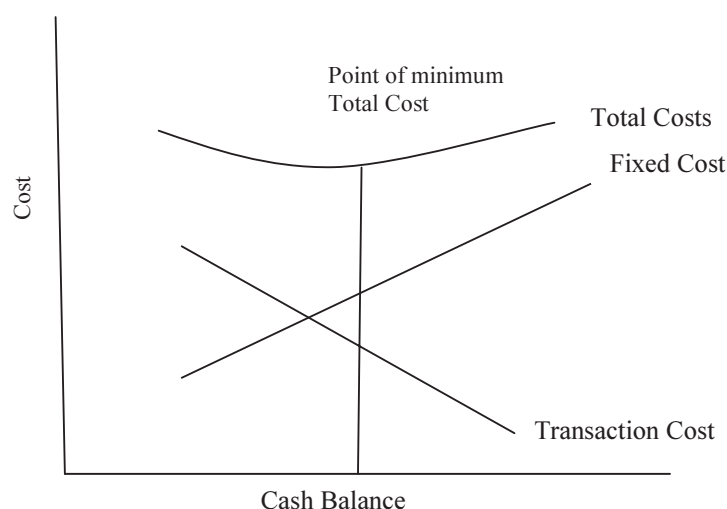
Limitations - The EOQ model to determine the optimum size of cash balances is suffered with several practical problems. The first and important problem (limitation) is related with determination of fixed cost associated with replenishing cash. The fixed cost includes both explicit cost (interest rate at which required capital can be secured from the market and implicit cost (time spent in placing an order for getting financial assistance etc.) The computation of implicit cost is very difficult. The model is not useful and applicable where the cash flows are irregular in nature.

B) Stochastic (irregular) Model - This model is developed to avoid the problems associated with the EOQ model. This model was developed by Miller and Orr. The basic assumption of this model is that cash balances are irregular, i.e., changes randomly over a period of time both in size and direction and form a normal distribution as the number of periods observed increases. The model prescribes two control limits Upper control Limit (UCL) and Lower Control Limit (LCL). When the cash balances reaches the upper limit a transfer of cash to investment account should be made and when cash balances reach the lower point a portion of securities constituting investment account of the company should be liquidated to return the cash balances to its return point. The control limits are converting securities into cash and the vice – versa, and the cost carrying stock of cash.

The Miller and Orr model is the simplest model to determine the optimal behavior in irregular cash flows situation. The model is a control limit model designed to determine the time and size of transfers between an investment account and cash account. There are two control limits. Upper Limit (U) and lower limit (L).

According to this model when cash balance of the company reach the upper limit, cash equal to "U – O" should be invested in marketable securities so that new cash balance touches "O" point. If the cash balance touch the "L' point, finance manager should immediately liquidate that much portion of the investment portfolio which could return the cash balance to 'O' point. (O is optimal point of cash balance or target cash balance)

The "O" optimal point of cash balance is determined by using the formula

$$O = \sqrt[3]{\frac{3TV}{4I}}$$

Where,

O = target cash balance (Optimal cash balance)

T= Fixed cost associated with security transactions

I = Interest per day on marketable securities

V = Variance of daily net cash flows.
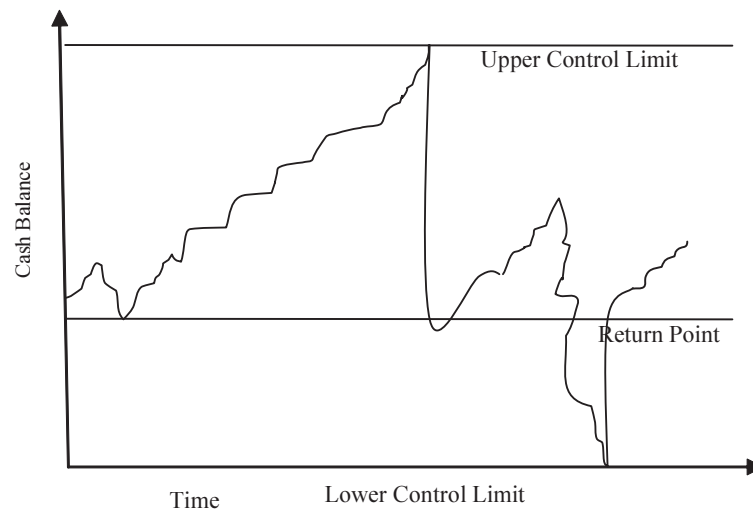
Limitations: This model is subjected to some practical problems

1) The first and important problem is in respect of collection of accurate data about transfer costs, holding costs, number of transfers and expected average cash balance.

2) The cost of time devoted by financial managers in dealing with the transfers of cash to securities and vice versa.

3) The model does not take in account the short term borrowings as an alternative to selling of marketable securities when cash balance reaches lower limit.

Besides the practical difficulties in the application of the model, the model helps in providing more, better and quicker information for management of cash. It was observed that the model produced considerable cost savings in the real life situations.

C) Probability Model - This model was developed by William Beranek. Beranek observed that cash flows of a firm are neither completely predictable nor irregular (stochastic). The cash flows are predictable within a range. This occurrence calls for formulating the demand for cash as a probability distribution of possible outcomes.

According to this model, a finance manager has to estimate probabilistic out comes for net cash flows on the basis of his prior knowledge and experience. He has to determine what is the operating cash balance for a given period, what is the expected net cash flow at the end of the period and what is the probability of occurrence of this expected closing net cash flows.

The optimum cash balance at the beginning of the planning period is determined with the help of the probability distribution of net cash flows. Cost of cash shortages, opportunity cost of holding cash balances and the transaction cost.

Assumptions :

1) Cash is invested in marketable securities at the end of the planning period say a week or a month.

2) Cash inflows take place continuously throughout the planning period.

3) Cash inflows are of different sizes.

4) Cash inflows are not fully controllable by the management of firm.

5) Sale of marketable securities and other short term investments will be effected at the end of the planning period.

The probability model prescribed the decision rule for the finance manager that the finance manager should go on investing in marketable securities from the opening cash balance until the expectation, that the ending cash balance will be below the optimum cash balance, where the ratio of the incremental net return per rupee of investment is equal to the incremental shortage cost per rupee.

III. Strategy for economizing cash - Once cash flow projections are made and appropriate cash balances are established, the finance manager should take steps towards effective utilization of available cash resources. A number of strategies have to be developed for this purpose they are:

a) Strategy towards accelerating cash inflows, and

b) Strategy towards decelerating cash outflows

a) **Strategy towards accelerating cash inflows** - In order to accelerate the cash inflows and maximize the available cash the firm has to employ several methods such as reduce the time lag between the movement of a payment to the company is mailed and the movement of the funds are ready for redeployment by the company. This includes the quick deposit of customer's cheques, establishing collection centers and lock – box system etc.

i) **Quick deposit of customer's cheques** - The inflow are accelerated through quick deposit of cheques in the banks, the moment they are received. Special attention should be given to deposit the cheques without any delay.

ii) **Establishing collection centres** - In order to accelerate the cash inflows the organization may establish collection centres in various marketing centres of the country. These centres may collect the cheques or payments from the customers and deposit them in the local bank. Thus, these cheques are collected immediately at the collection centre and the bank can transfer the surplus money, if any, to the company's main bank. Thus, the decentralized collection system of the company reduced the time lag in cash remittances and collections.

iii) **Lock-box method** - The new device which is popular in recent past is lock-box method which will help to reduce the time interval from the mailing of the cheque to the use of funds by the company. Under this arrangement, the company rents lock-box from post offices through its service area. The customer's are instructed to mail cheques to the lock-box. The company's bank collects the mail from the lock-box several times a

day and deposit them directly in the company's account on the same day. This will reduce the time in mailing cheques, deposit them in bank and there by reduce overhead costs to the company. But one of the serious limitations of the system is that the banks will charge additional service costs to the company. However, this system is proved useful and economic to the firm.

b) **Strategy for slowing cash outflows** - In order to accelerate cash availability in the company, finance manager must employ some devices that could slow down the speed of payments outward in addition to accelerating collections. The methods of slowing down disbursements are as flows:

i) **Delaying outward payment** - The finance manager can increase the cash turnover by delaying the payment on bills until the due date of the no-cost period. Thus, he can economise cash resources of the firm.

ii) **Making pay roll periods less frequent** - The firm can economise its cash resources by changing the frequency of disbursing pay to its employees. For example, if the company is presently paying wages weekly, it can effect substantial cash savings if the pay is disbursed only once in a month.

iii) **Solving disbursement by use of drafts** - A company can delay disbursement by use of drafts on funds located elsewhere. When the firm pays the amount through drafts, the bank will not make the payment against the draft unless the bank gets the acceptance of the issuer firm. Thus the firm need not have balance in its bank account till the draft is presented for acceptance. On the other hand, it will take several days for the draft to be actually paid by the company. Thus finance manager can economise large amounts of cash resources for atleast a fort night. The funds saved could be invested in highly liquid low risk assets to earn income there on.

iv) **Playing the float** - Float is the difference between the company's cheque book balance and the balance shown in the banks books of accounts. When the company writes a cheque, it will reduce the balance in its books of accounts by the amount of cheque. But the bank will debit the amount of its customers only when the cheque is collected. On the other hand, the company can maximize its cash utilization by ignoring its book blance and keep its cash invested until just before the cheques are actually presented for payment. This technique is known as "playing the float".

v) **Centralised payment system** - A firm can delay payments through centralized payment system. Under this system, payments will be made from a single central account. This will benefit the company.

vi) By transferring funds from one bank to another bank firm can maximize its cash turnover.

MANAGEMENT OF RECEIVABLES :

Receivables mean the book debts or debtors and these arise, if the goods are sold on credit. Debtors form about 30% of current assets in India. Debt involves an element of risk and bad debts also. Hence, it calls for careful analysis and proper management. The goal of receivables

management is to maximize the value of the firm by achieving a trade off between risk and profitability. For this purpose, a finance manager has:

a. to obtain optimum (non-maximum) value of sales;

b. to control the cost of receivables, cost of collection, administrative expenses, bad debts and opportunity cost of funds blocked in the receivables.

c. to maintain the debtors at minimum according to the credit policy offered to customers.

d. to offer cash discounts suitably depending on the cost of receivables, bank rate of interest and opportunity cost of funds blocked in the receivables.

Costs of Maintaining Receivables

The costs with respect to maintenance of receivables can be identified as follows

1. *Capital costs* - Maintenance of accounts receivable results in blocking of the firm's financial resources in them. This is because there is a time lag between the sale of goods to customers and the payments by them. The firm has, therefore, to arrange for additional funds to meet its own obligations, such as payment to employees, suppliers of raw materials, *etc.*, while awaiting for payments from its customers. Additional funds may either be raised from outside or out of profits retained in the business. In first the case, the firm has to pay interest to the outsider while in the latter case, there is an opportunity cost to the firm, *i.e.*, the money which the firm could have earned otherwise by investing the funds elsewhere.

2. *Administrative costs* - The firm has to incur additional administrative costs for maintaining accounts receivable in the form of salaries to the staff kept for maintaining accounting records relating to customers, cost of conducting investigation regarding potential credit customers to determine their credit worthiness *etc*.

3. *Collection costs* - The firm has to incur costs for collecting the payments from its credit customers. Sometimes, additional steps may have to be taken to recover money from defaulting customers.

4. *Defaulting costs* - Sometimes after making all serious efforts to collect money from defaulting customers, the firm may not be able to recover the overdues because of the inability of the customers. Such debts are treated as bad debts and have to be written off since they cannot be realised.

Benefits of Maintaining Receivables

a.   *Increase in Sales* - Except a few monopolistic firms, most of the firms are required to sell goods on credit, either because of trade customers or other conditions. The sales can further be increased by liberalizing the credit terms. This will attract more customers to the firm resulting in higher sales and growth of the firm.

b.   *Increase in Profits* - Increase in sales will help the firm (i) to easily recover the fixed expenses and attaining the break-even level, and (ii) increase the operating profit of the firm. In a normal situation, there is a positive relation between the sales volume and the profit.

c.   *Extra Profit* - Sometimes, the firms make the credit sales at a price which is higher than the usual cash selling price. This brings an opportunity to the firm to make extra profit over and above the normal profit.

Factors Affecting the Size of Receivables

The size of accounts receivable is determined by a number of factors. Some of the important factors are as follows

1.   *Level of sales* - This is the most important factor in determining the size of accounts receivable. Generally in the same industry, a firm having a large volume of sales will be having a larger level of receivables as compared to a firm with a small volume of sales.

Sales level can also be used for forecasting change in accounts receivable. For example, if a firm predicts that there will be an increase of 20% in its credit sales for the next period, it can be expected that there will also be a 20% increase in the level of receivables.

2.   *Credit policies* - The term credit policy refers to those decision variables that influence the amount of trade credit, *i.e.,* the investment in receivables. These variables include the quantity of trade accounts to be accepted, the length of the credit period to be extended, the cash discount to be given and any special terms to be offered depending upon particular circumstances of the firm and the customer. A firm's credit policy, as a matter of fact, determines the amount of risk the firm is willing to undertake in its sales activities. If a firm has a lenient or a relatively liberal credit policy, it will experience a higher level of receivables as compared to a firm with a more rigid or stringent credit policy. This is because of the two reasons:

    i.   A lenient credit policy encourages even the financially strong customers to make delays in payment resulting in increasing the size of the accounts receivables.

    ii. Lenient credit policy will result in greater defaults in payments by financially weak customers thus resulting in increasing the size of receivables.

3.   *Terms of trade* - The size of the receivables is also affected by terms of trade (or credit terms) offered by the firm. The two important components of the credit terms are (i) Credit period and (ii) Cash discount.

Credit Period

The term credit period refers to the time duration for which credit is extended to the customers. It is generally expressed in terms of "Net days". For example, if a firm's credit terms are "Net 15", it means the customers are expected to pay within 15 days from the date of credit sale.

Cash Discount

Most firms offer cash discount to their customers for encouraging them to pay their dues before the expiry of the credit period. The terms of cash discount indicate the rate of discount as well as the period for which the discount has been offered. For example, if the terms of cash discount are changed from "Net 30" to "2/10 Net 30", it means the credit period is of 30 days but in case customer pays in 10 days, he would get 2% discount on the amount due

by him. Of course, allowing cash discount results in a loss to the firm because of recovery of less amount than what is due from the customer but it reduces the volume of receivables and puts extra funds at the disposal of the firm for alternative profitable investment. The amount of loss thus suffered is, therefore, compensated by the income otherwise earned by the firm.

Optimum Size of Receivables

The optimum investment in receivables will be at a level where there is a trade-off between costs and profitability. When the firm resorts to a liberal credit policy, the profitability of the firm increases on account of higher sales. However, such a policy results in increased investment in receivables, increased chances of bad debts and more collection costs. The total investment in receivables increases and, thus, the problem of liquidity is created. On the other hand, a stringent credit policy reduces the profitability but increases the liquidity of the firm. Thus, optimum credit policy occurs at a point where there is a "Trade-off" between liquidity and profitability as shown in the chart below.

Tight ← Credit Policy → Loose
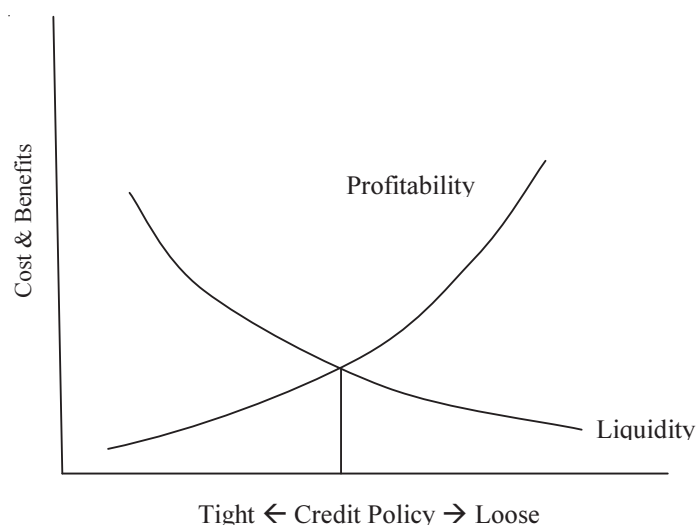
Determinants of Credit Policy

The following are the aspects of credit policy:
1. Level of credit sales required to optimise the profit.
2. Credit period *i.e.* duration of credit, whether it may be 15 days or 30 or 45 days *etc.*
3. Cash discount, discount period and seasonal offers.
4. Credit standard of a customer : 5 C's of credit :
    a. Character of the customer *i.e.* willingness to pay.
    b. Capacity——ability to pay.
    c. Capital——financial resources of a customer.
    d. Conditions——special conditions for extension of credit to doubtful customers and prevailing economic and market conditions and;
    e. Collateral security.
5. Profits.
6. Market and economic conditions.

7. Collection policy.

8. Paying habits of customers.

9. Billing efficiency, record-keeping *etc.*

10. Grant of credit——size and age of receivables.

Optimum Credit Policy

A firm should establish receivables policies after carefully considering both benefits and costs of different policies. These policies relate to:

(i) Credit Standards, (ii) Credit Terms, and (iii) Collection Procedures.

Each of these have been explained below:

i. **Credit standards -** The term credit standards represent the basic criteria for extension of credit to customers. The levels of sales and receivables are likely to be high if the credit standards are relatively loose, as compared to a situation when they are relatively tight. The firm's credit standards are generally determined by the five "C's". Character, Capacity, Capital, Collateral and Conditions. Character denotes the integrity of the customer, *i.e.* his willingness to pay for the goods purchased. Capacity denotes his ability to manage the business. Capital denotes his financial soundness. Collateral refers to the assets which the customer can offer by way of security. Conditions refer to the impact of general economic trends on the firm or to special developments in certain areas of economy that may affect the customer's ability to meet his obligations.

Information about the five C's can be collected both from internal as well external sources. Internal sources include the firm's previous experience with the customer supplemented by its own well developed information system. External resources include customer's references, trade associations and credit rating organisations such as Don & Brad Street Inc. of USA. This Organisation has more than hundred years experience in the field of credit reporting. It publishes a reference book six times a year containing information about important business firms region wise. It also supplies credit reports about different firms on request.

An individual firm can translate its credit information into risk classes or groups according to the probability of loss associated with each class. On the basis of this information, the firm can decide whether it will be advisable for it to extend credit to a particular class of customers.

ii. **Credit terms**

It refers to the terms under which a firm sells goods on credit to its customers. As stated earlier, the two components of the credit terms are (a) Credit Period and (b) Cash Discount. The approach to be adopted by the firm in respect of each of these components is discussed below:

(a) *Credit period* - Extending the credit period stimulates sales but increases the cost on account of more tying up of funds in receivables. Similarly, shortening the credit period reduces the profit on account of reduced sales, but also reduces the cost of tying up of funds in receivables. Determining the optimal credit period, therefore, involves locating the period where the marginal profits on increased sales are exactly offset by the cost of carrying the higher amount of accounts receivable.

(b) *Cash discount* - The effect of allowing cash discount can also be analysed on the same pattern as that of the credit period. Attractive cash discount terms reduce the average collection period resulting in reduced investment in accounts receivable. Thus, there is a saving in capital costs. On the other hand, cash discount itself is a loss to the firm. Optimal discount is established at the point where the cost and benefit are exactly offsetting.

iii. Collection procedures

A stringent collection procedure is expensive for the firm because of high out-of-pocket costs and loss of goodwill of the firm among its customers. However, it minimises the loss on account of bad debts as well as increases savings in terms of lower capital costs on account of reduction in the size of receivables. A balance has therefore to be stuck between the costs and benefits of different collection procedures or policies.

Credit evaluation of customer

Credit evaluation of the customer involves the following 5 stages

i. Gathering credit information of the customer through:

    a. financial statements of a firm,

    b. bank references,

    c. references from Trade and Chamber of Commerce,

    d. reports of credit rating agencies,

    e. credit bureau reports,

    f. firm's own records (Past experience),

    g. other sources such as trade journals, Income-tax returns, wealth tax returns,

       sales tax returns, Court cases, Gazette notifications *etc.*

ii. Credit analysis - After gathering the above information about the customer, the credit-worthiness of the applicant is to be analysed by a detailed study of 5 C's of credit as mentioned above.

iii. Credit decision - After the credit analysis, the next step is the decision to extend the credit facility to potential customer. If the analysis of the applicant is not upto the standard, he may be offered cash on delivery (COD) terms even by extending trade discount, if necessary, instead of rejecting the credit to the customer.

iv. Credit limit - If the decision is to extend the credit facility to the potential customer, a limit may be prescribed by the financial manager, say, Rs. 25,000 or Rs. 1,00,000 or so, depending upon the credit analysis and credit-worthiness of the customer.

v. Collection procedure - A suitable and clear-cut collection procedure is to be established by a firm and the same is to be intimated to every customer while granting credit facility. Cash discounts may also be offered for the early payment of dues. This facilitates faster recovery.

Problems

The working capital estimation as per the method of operating cycle, is the most systematic and logical approach. In this case, the working caital estimation is made on the basis of analysis of each and every component of the working capital individually. As already discussed, the working capital, required to sustain the level of planned operations, is determined by calculating all the individual components of curent assets and current liabilities. The calculation of net working capital may also be shown as follows ;

Working Capital	=	Current Assets – Current Liabilitie
	=	(Raw Materials Stock + Work-in-progress Stock + Finished Goods Stock + Debtors + Cash Balance) – (Creditors + Outstanding Wages + Outstanding Overheads).

Where,

Raw Materias	=	Cost (Average) of Materials in Stock.
Work-in-progress Stock	=	Cost of Materials + Wages +Overhead of Work-in-progress.
Finished Goods Stock	=	Cost of Materials + Wages +Overhead of Finished Goods.
Creditors for Material	=	Cost of Average Outstanding Creditors.
Creditors for Wages	=	Averages Wages Outstanding.
Creditors for Overhead	=	Average Overheads Outstanding.

Thus, Working Capital	=	Cost of Materials in Stores, in Work-in-progress, in Finished Goods and in Debtors.
		Less : Creditors for Materials
		Plus : Wages in Work-in-progress, in Finished Goods and in Debtors.
		Less : Creditors for Wages.
		Plus : Overheads in Work-in-progress, in Finished Goods and in Debtors.
		Less : Creditors for Overheds.

The work sheet for estimation of working capital requirements under the operating cycle method may be presented as follows :

Estimation of Working Capital Requirements

I Current Assets :	Amount	Amount	Amount
Minimum Cash Balance		****	
Inventories :			
Raw Materials	****		
Work-in-progress	****		
Finished Goods	****	****	

Receivables :			
Debtors	****		
Bills	****	****	
Gross Working Capital (CA)		****	****

II   Current Liabilities :

Creditors for Purchases		****	
Creditors for Wages		****	
Creditors for Overheads		****	****
Total Current Liabilities (CL)		****	****
Excess of CA over CL			****
+ Safety Margin			****
Net Working Capital			****

The following points are also worth noting while estimating the working capital requirement :

1. **Depreciation :** An important point worth noting while estimating the working capital requirement is the depreciation on fixed assets. The depreciation on the fixed assets, which are used in the production process or other activities, is not considered in working capital estimation. The depreciation is a non-cash expense and there is no funds locked up in depreciation as such and therefore, it is ignored. Depreciation is neither included in valuation of work-in-progress nor in finished goods. The working capital calculated by ignoring depreciation is known as *cash basis working capital*. In case, depreciation is included in working capital calculations, such estimate is known as *total basis woking capital*.

2. **Safety Margin :** Sometimes, a firm may also like to have a safety margin of working capital in order to meet any contingency. The safety margin may be expressed as a % of total current assets or total current liabilities or net workiong capital. The safety margin, if required, is incorporated in the working capital estimates to find out the net working capital required for the firm. There is no hard and fast rule about the quantum of safety margin and depends upon the nature and characteristics of the firm as well as of its current assets and current liabilities.

Illustration 1

The cost sheet of POR Ltd. provides the following data :

	Cost per unit
Raw materials	Rs. 50
Direct Labor	20
Overheads (including depreciation of Rs. 10)	40
Total cost	110
Profits	20
Selling price	130

Average raw material in stock is for one month. Average materials in work-in-progress is for half month. Credit allowed by suppliers; one month; credit allowed to debtors; one month. Average time lag in payment of wages; 10 days; average time lag in payment of overheads

30 days. 25% of the sales are on cash basis. Cash balance expected to be Rs. 1,00,000. Finished goods lie in the warehouse for one month.

You are required to prepare a statement of the working capital needed to finance a level of the acitivity of 54,000 units of output. Production is carried on evenly throughout the year and wages and overheads accrue similarly. State your assumptions, if any, clearly.

Solution :

As the annual level of acitivity is given at 54,000 units, it means that the monthly turnover would be 54,000/12=4,500 units. The working capital requirement for this monthly turnover can now be estimated as follows :

Estimation of Working Capital Requirements

I Current Assets :	Amount (Rs.)	Amount (Rs.)
Minimum Cash Balance	1,00,000	
Inventories :		
Raw Materials (4,500×Rs. 50)	2,25,000	
Work-in-progress :		
Materials (4,500×Rs. 50)/2	1,12,500	
Wages 50% of (4,500×Rs. 20)/2	22,500	
Overheads 50% of (4,500×Rs. 30)/2	33,750	
Finished Goods (4,500×Rs. 100)	4,50,000	
Debtors (4,500×Rs. 100×75%)	3,37,500	
Gross Working Capital	12,81,250	12,81,250
II **Current Liabilities :**		
Creditors for Materials (4,500×Rs. 50)	2,25,000	
Creditors for Wages (4,500×Rs. 20)/3	30,000	
Creditors for Overheads (4,500×Rs. 30)	1,35,000	
Total Current Liabilities	3,90,000	3,90,000
Net Working Capital		8,91,250

Working Notes :

1. The Overheads of Rs. 40 per unit include a depreciation of Rs. 10 per unit, which is a non-cash item. This depreciation cost has been ignored for valuation of work-in-progress, finished goods and debtors. The overhead cost, therefore, has been taken only at Rs. 30 per unit.

2. In the valuation of work-in-progress, the raw materials have been taken at full requirements for 15 days; but the wages and overheads have been taken only at 50% on the assumption that on an average all units in work-in-progress are 50% complete.

3. Since, the wages are paid with a time lag of 10 days, the working capital provided by wages has been taken by dividing the monthly wages by 3 (assuming a month to consist of 30 days).

Illustration 2

Grow More Ltd. is presently operating at 60% level, producing 36,000 units per annum. In view of favourable market conditions, it has been decided that from 1st January 2009, the

Company would operate at 90% capacity. The following informations are available :

(i) Existing cost-price structure per unit is given below : (Rs.)

Raw materials	4.00
Wages	2.00
Overheads (Variable)	2.00
Overheads (Fixed)	1.00
Profits	1.00

(ii) It is expected that the cost of raw material, wages rate expenses and sales per unit will remain unchanged in 2009.

(iii) Raw materials remain in store for 2 months before these are issued to production. These units remain in production process for 1 month.

(iv) Finished goods remain in godown for 2 months.

(v) Credit allowed to debtors is 2 months. Credit allowed by creditors is 3 months.

(vi) Lag in wages and overhead payments is 1 months. It may be assumed that wages and overhead accrue evenly throughout the production cycle.

You are required to :

(a) Prepare profit statement at 90% capacity level; and

(b) Calculate the working capital requirements on an estimated basis to sustain the increased production level.

Assumption made if any, should be clearly indicated.

Solution :

Statement of Profitability at 90% Capacity

Units (at 90% capacity)	54,000
Sales (54,000×Rs. 10) (A)	Rs. 5,40,000
Cost :	
Raw materials (54,000×Rs. 4)	2,16,000
Wages (54,000×Rs. 2)	1,08,000
Variable overhead (54,000×Rs. 2)	1,08,000
Fixed overhead (Rs. 1×36,000)	36,000
Total cost (B)	4,68,000
Net Profit (A–B)	72,000

Statement of Working Capital Requirement

A. Current Assets :	(Rs.)	(Rs.)
Stock of raw materials (2 months×4,500×Rs. 4)		36,000
Work-in-progress :		
Materials (1 month×4,500×Rs. 4)	18,000	
Wages (1/2 month)	4,500	
Overheads (1/2 month)	6,000	28,500
Finished goods (2 month)		78,000
Debtors [2 months × (4,68,000/12)]		78,000
Total Current Assets		2,20,500

B. **Current Liabilities**

Sundry creditors (goods)-3 months	54,000
Outstanding wages (1 month)	9,000
Outstanding overhead (1 month)	12,000
Total Current liabilities	75,000
Working capital requirment	1,45,500

Working Note :

Overhead and Wages — The work in progress period is one month. So, the wages and overheads included in work-in-progress, are on an average, for half month or 1/24 of a year.

$$\text{Wages} = \frac{\text{Rs.}\,1,08,000}{24} = \text{Rs.}\,4,500$$

$$\text{Overhead} = \frac{\text{Rs.}\,1,08,000 + 36,000}{24} = \text{Rs.}\,6,000$$

The valuation of finished goods can also be arrived at as follows :

Number of units	= 4,500×2 = 9,000
Variable cost	= Rs. 8 per unit
Fixed Cost (Rs. 36,000/12)×2	= Rs. 6,000
Total cost of finished goods (9,000×8) + 6,000	= Rs. 78,000

As the decision to increase the operating capacity from 60% to 90% is already taken, it has been assumed hat the opening balance of raw materials, work in progress and finished goods have already been brought to the desired level. Consequently, good purchased during the period will be only for the production requirement and not for increasing the level of stock.

Illustration 3

The management of Royal Industries has called for a statement showing the working capital to finance a level of acitivity of 1,80,000 units of output for the year. The cost structure for the company's product for the above mentioned activity level is detailed below :

	Cost per unit
Raw material	Rs. 20
Direct labour	5
Overheads (including depreciation of Rs. 5 per unit)	15
	40
Profit	10
Selling price	50

Additional information :

(a) Minimum desired cash balance is Rs. 20,000

(b) Raw materials are held in stock, on an average, for two months.

(c) Work-in-progress (assume 50% completion stage) will approximate to half-a-month's production.

(d) Finished goods remian in werehouse, on an average, for a month.

(e) Suppliers of materials extend a month's credit and debtors are provided two month's credit; cash sales are 25% of total sale.

(f) There is a time-lag in payment of wages of a month; and half-a-month in the case of overheads.

From the above facts, you are required to prepare a statment showing working capital requirements.

Solution :

Statement of Total Cost

Raw material (1,80,000×Rs. 20)	Rs. 36,00,000
Direct labour (1,80,000×Rs. 5)	9,00,000
Overheads (excluding depreciation) (1,80,000×Rs. 10)	18,00,000
Total Cost	63,00,000

Statement of Working Capital Requirement

1.	Current Assets :	Amt. (Rs.)
	Cash balance	20,000
	Raw materials (1/6 of Rs. 36,00,000)	6,00,000
	Work-in-progress (Total cost/24×50%)	1,31,250
	Finished goods (Total cost/12)	5,25,000
	Debtors (75%×Rs. 63,00,000)×1/6	7,87,500
	Total current assets	20,63,750
2.	**Current liablities :**	
	Creditors (Rs. 36,00,000)×1/12	3,00,000
	Direct labour (Rs. 9,00,000)×1/12	75,000
	Overheads (Rs. 18,00,000)×1/24 (excluding dep.)	75,000
	Total current liabilities	4,50,000
	Net working capital requirement	16,13,750

Note : Depreciation is a non-cash item, therefore, it has been excluded from total cost as well as working capital provided by overheads. Work-in-progress has been assumed to be 50% complete in respect of materisls as well as labour and overheads expenses.

Illustration 4

XYZ Ltd. sells its products on a gross profit of 20% of sales. The following information is extracted from its annual accounts for the year ending 31st March, 2009.

Sales (at 3 months credit)	Rs. 40,00,000
Raw material	12,00,000
Wages (15 days in arrears)	9,60,000
Manufacturing and General expenses (one month in arrears)	12,00,000
Administration expenses (one month in arrears)	4,80,000
Sales promotion expenses (payable half yearly in advance)	2,00,000

The company enjoys one month's credit from the suppliers of raw materials and maintains 2 months stock of raw materials and 1½ months finished goods. Cash balance is maintained at Rs. 1,00,000 as a precautionary balance. Assuming a 10% margin, find out the working capital requirement of XYZ Ltd.

Solution :

Statement of Working Capital Requirement

	Amt. (Rs.)
1. Current Assets :	
Debtors (40,00,000×3/12×80%) (at cost of goods sold)	8,00,000
Raw maetrial stock (2/12 of 12,00,000)	2,00,000
Finished goods stock (1½ months of cost of production)	
(Cost of production being 80% of sales of 40,00,000)	4,00,000
Advance payment of sales promotion	1,00,000
Cash	1,00,000
Total Current assets	16,00,000
2. Current liabilities :	
Sundry creditors (1/12 of 12,00,000)	1,00,000
Wages (arrears for 15 days) (1/24 of 9,60,000)	40,000
Manu, and Gen. exp. (arrears for 1 month)(1/12 of 12,00,000)	1,00,000
Administrative exp. (arrears for 1 months) (1/12 of 4,80,000)	40,000
Total Current liabilities	2,80,000
Excess of Current Assets and Current Liabilities	13,20,000
Add 10% margin	1,32,000
Net working capital requirement	14,52,000

Illustration 5

Hi-tech Ltd. plans to sell 30,000 units next year. The expected cost of goods sold is as follows :

	Rs. (Per Unit)
Raw material	100
Manufacturing expenses	30
Selling, administration and financial expenses	20
Selling price	200

The duration at various stages of the operating cycle is expected to be as follows :

Raw material stage	2 months
Work-in-progress stage	1 month
Finished stage	1/2 month
Debtors stage	1 month

Assuming the monthly sales level of 2,500 units, estimate the gross working capital requirement. Desired cash balance is 5% of the gross working capital requirement, and work-in-progress in 25% complete with respect to manufacturing expenses.

Solution :

Statement of Working Capital Requirement

1. Current Assets :	Amt. (Rs.)	Amt. (Rs.)
Stock of Raw Material (2,500×2×100)		5,00,000
Work-in-progress :		
Raw Materials (2,500×100)	2,50,000	
Manufacturing Expenses 25% of (2,500×30)	18,750	2,68,750
Finished Goods :		
Raw Materials (2,500×½×100)	1,25,000	
Manufacturing Expenses (2,500×½×30)	37,500	1,62,500
Debtors (2,500×150)		3,75,000
		13,06,250
Cash Balance (13,06,250×5/95)		68,750
Working Capital Requirement		13,75,000

Note : Selling, administration and financial expenses have not been included in valuation of closing stock.

Illustration 6

Calculate the amount of working capital requirement for SRCC Ltd. from the following information :

	Rs. (Per Unit)
Raw materials	160
Direct labour	60
Overheads	120
Total cost	340
Profit	60
Selling price	400

Raw materials are held in stock on an average for one month. Materials are in process on an average for half-a-month. Finished goods are in stock on an average for one month.

Credit allowed by suppliers is one month and credit allowed to debtors is two months. Time lag in payment of wages is 1½ weeks. Time lag in payment of overhead expenses is one month. One fourth of the sales are made on cash basis.

Cash in hand and at the bank is expected to be Rs. 50,000; and expected level of production amounts to 1,04,000 units for a year of 52 weeks.

You may assume that production is carried on evenly throughout the year and a time period of four weeks is equivalent to a month.

Solution :

<p align="center">**Statement of Working Capital Requirement**</p>

1. Current Assets :	Amt. (Rs.)	Amt. (Rs.)
Cash Balance		50,000
Stock of Raw Materials (2,000×160×4)		12,80,000
Work-in-progress :		
Raw Materials (2,000×160×2)	6,40,000	
Labour and Overheads (2,000×180×2)×50%	3,60,000	10,00,000
Finished Goods (2,000×340×4)		27,20,000
Debtors (2,000×75%×340×8)		40,80,000
Total Current Assets		91,30,000
2. Current Liabilities :		
Creditors (2,000×Rs. 160×4)		12,80,000
Creditors for Wages (2,000×Rs. 60×1½)		1,80,000
Creditors for Overheads (2,000×Rs. 120×4)		9,60,000
Total Current Liabilities		24,20,000
Net Working Capital (CA–CL)		67,10,000

Illustration 7

X Ltd. sells goods at a gross profit of 20%. It includes depreciation as part of cost of production. The following figures for the 12 months ending 31st Dec. 2008 are given to enable you to ascertain the requirement of working capital of the company on a cash cost basis.

In your working, you are required to assume that :

(i) a sefety margin of 15% will be maintained;

(ii) cash is to be held to the extent of 50% of current liabilities.

(iii) there will be no work-in-progress;

(iv) tax is to be ignored.

Stocks of raw materials and finished goods are kept at one month's requirements. All working notes are to form part of your answer.

Sales at 2 months credit	Rs. 27,00,000
Materials consumed (suppliers credit is for 2 months)	6,75,000
Total wages (paid at the beginning of the next month)	5,40,000
Manufacturing expenses outstanding at the end of the year	60,000
(These expenses are paid one month in arrears)	
Total administrative expenses (paid as above)	1,80,000
Sales promotion expenses paid quarterly and in advance	90,000

Solution :

Calculation of Manufacturing Cost–(Cash Cost only)

	Materials Consumed	Rs. 6,75,000
	Wages	5,40,000
	Cash manufacturing expenses (Rs. 60,000×12)	7,20,000
A)	**Cash manufacturing cost**	19,35,000
B)	**Cost of sales (cash cost only)**	
	Cash manufacturing cost (as per 'A' above)	19,35,000
	Administrative expenses	1,80,000
	Sales promotion expenses	90,000
		22,05,000
C)	**Current Liabilities**	
	Creditors for goods (1/6 of materials consumed)	1,12,500
	Outstanding wages (1 month) (Rs. 5,40,000/12)	45,000
	Cash manufacturing cost (outstanding one month)	60,000
	Administrative expenses (outstanding one month)	15,000
		2,32,500
D)	**Current assets**	
	Debtors (at cost of sales) (Rs. 22,05,000/12)×2	3,67,500
	Stock of raw materials (Rs. 6,75,000/12)	56,250
	Finished stock (1/12 of Rs. 19,35,000)	1,61,250
	Cash in hand–50% of current liabilities	1,16,250
	Advance payment of expenses (sales promotion)	22,500
	Total Current assets	7,23,750
	– Current liabilities	2,32,500
	Excess of current assets over current liabilities	4,91,250
	+ Safety margin 15%	73,687
	Working capital on cash cost basis	5,64,937

It may be noted that Gross Profit ratio is given at 20%. So, the cost of production (inclusive of depreciation is 80%. For Sales of Rs. 27,00,000, the total cost of goods sold comes to Rs. 21,60,000 (*i.e.*, 80% of 27,00,000). But the cash manufacturing cost is only Rs. 19,35,000. Therefore, depreciation would have been Rs. 2,25,000 (i.e., Rs. 21,60,000–Rs. 19,35,000).

Illustration 8

A Company has applied a short-term loan to a commercial bank for financing its working capital requirement. You are asked by the bank to prepare an estimate of the requirement of the working capital for that company. Add 10% to your estimated figure to cover unforeseen contingencies. The information about the project Profit and Loss A/c of the company is as under :

Sales	Rs. 21,00,000
Cost of goods sold	15,30,000
Gross Profit	5,70,000

Administrative expenses	Rs. 1,40,000	
Selling expenses	1,30,000	2,70,000
Profit before Tax		3,00,000
Provision for Tax		1,00,000

Cost of goods sold has been derived as follows :

Materials used	8,40,000	
Wages and Manufacturing expenses	6,25,000	
Depreciation	2,35,000	17,00,000
–Stock of finished goods (10% of total production)		1,70,000
		15,30,000

The figure given above relate only to the goods that have been finished and not to W.I.P. goods which is equal to 15% of the year's production (in terms of physical units) on an average, requiring full materials but only 40% of the other expenses. The company believes in keeping 2 months consumption of material in stock.

All expenses are paid one month in arrears. Suppliers of mateials extend 1½ months credit. Sales are 20% cash, rest are at 2 months credit. You can make such other assumptions as you deem necessary for estimating working capital requirement.

Solution :

1. Current Assets :

Stock of Raw Materials (2/12 of 8,40,000)		Rs. 1,40,000
Work-in-progress :		
Raw maertials (15/100 of 8,40,000)	Rs. 1,26,000	
Wages and manufacturing (6,25,000×40%×15%)	37,500	1,63,500
Stock finished goods : [10% of (8,40,000+6,25,000)]		1,46,500
Debtors (2 months) :		
Cost of goods sold	15,30,000	
–Depreciation (2,35,000–23,500)	2,11,500	
	13,18,500	
Adm. Expenses	1,40,000	
Selling Expenses	1,30,000	
Total Cost	15,88,500	
–Cash sales @ 20%	3,17,700	
	12,70,800	
Debtors (2/12 of 12,70,800)		2,11,800
		6,61,800

2. Current Liabilities :

Creditors (8,40,000/12×1½)	1,05,000	
O/S Wages and Manufacturing exp. (1/12 of 6,25,000)	52,083	
O/S Administrative expenses (1/12 of 1,40,000)	11,667	
Selling expenses (1/12 of 1,30,000)	10,833	1,79,583

Excess of curent assets over current liabilities	4,82,217
+ 10% for contigencies	48,222
Working capital requirement	5,30,439

Illustration 9

JBC Ltd. sells goods on a gross profit of 25%. Depreciation is considered as a part of cost of production. The following are the annual figures given to you :

Sales (2 months credit)	Rs. 18,00,000
Materials consumed (1 months credit)	4,50,000
Wages paid (1 month lag in payment)	3,60,000
Cash manufacturing expenses (1 month lag in payment)	4,80,000
Administrative expenses (1 month lag in payment)	1,20,000
Sales promotion expenses (paid quarterly in advance)	60,000

The company keeps one month's stock each of raw materials and finished goods. It also keeps Rs. 1,00,000 in cash. You are required to estimate the working capital requirements of the company on cash cost basis, assuming 15% safety margin.

Solution :

Statement of Working Capital Requirement

	Amt. (Rs.)
1. Current Assets :	
Cash-in-hand	1,00,000
Debtors (cost of sales i.e. 14,70,000×2/12)	2,45,000
Prepaid Sales Promotion expenses	15,000
Inventories :	
Raw Materials (4,50,000/12)	37,500
Finishd goods (12,90,000/12)	1,07,500
Total current assets	5,05,000
2. Current Liabilities :	
Sundry creditors (4,50,000/12)	37,500
Outstanding Manufacturing exp. (4,80,000/12)	40,000
Outstanding Administrative exp. (1,20,000/12)	10,000
Outstanding Wages (3,60,000/12)	30,000
Total current liabilities	1,17,500
Excess of CA and CL	3,87,500
+ 15% for contingencies	58,125
Working capital required	4,45,625

Working Notes :

1. Cost Structure

		Rs.
Sales		18,00,000
– Gross profit 25% on sales		4,50,000
Cost of production		13,50,000
– Cost of materials	Rs. 4,50,000	
– Wages	3,60,000	8,10,000

Manufacturing expenses (Total)	5,40,000
– Cash Manufacturing expenses	4,80,000
Therefore, Depreciation	60,000

2. **Total cash cost :**

Cost of production	13,50,000
– Depreciation	60,000
+ Administrative expenses	1,20,000
+ Sales promotion expenses	60,000
Total Cash Cost	14,70,000

Illustration 10

Prepare a working capital forecast from the following information :

Production during the previous year was 10,00,000 units. The same level of activity is intended to be maintained during the current year.

The expected ratios of cost to selling price are :

Raw material	40%
Direct Wages	20%
Overheads	20%

The raw materials ordinarily remian in stores for 3 months before production. Every unit of production remains in the process for 2 months and is assumed to be consisting of 100% raw material, wages and overheads. Finished goods remain in the warehouse for 3 months. Credit allowed by creditors is 4 months from the date of the delivery of raw material and credit given to debtors is 3 months from the date of dispatch.

The estimated balance of cash to be held Rs. 2,00,000

Lag in payment of wages 1/2 month

Lag in payment of expenses 1/2 month

Selling price is Rs. 8 per unit. Both production and sales are in a regular cycle. You are required to make a provision of 10% for contingency (except cash). Relevant assumptions may be made.

Solution :

Total Sales = 10,00,000×8=Rs. 80,00,000

Statement of Working Capital Requirement

	Rs.	Rs.
A. Current Assets :		
Debtors (80,00,000×80%×3/12)	16,00,000	
Finished Goods (80,00,000×80%×3/12)	16,00,000	
Work-in-progress (80,00,000×80%×2/12)	10,66,667	
Raw Materials (80,00,000×40%×3/12)	8,00,000	
Total current assets	50,66,667	50,66,667
B. Current Liabilities :		
Creditors (80,00,000×40%×4/12)	10,66,667	
Wages (80,00,000×20%×1/24)	66,667	
Expenses (80,00,000×20%×1/24)	66,666	12,00,000

Excess of CA over CL	38,66,667
+ 10% contingency	3,86,667
	42,53,334
Cash	2,00,000
Working Capital Requirement	44,53,334

Illustration 11

On 1st January, 2009, the Board of Directors of Dowell Co. Ltd. wishes to know the amount of working capital that will be required to meet the program of acitivity they have planned for the year. The following informations are available :

  i) Issued and paid-up capital Rs. 2,00,000.
 ii) 5% Debebtures (secured on assets) Rs. 50,000.
iii) Fixed assets valued at Rs. 1,25,000 on 31.12.2008.
 iv) Production during the previous year was 60,000 units. It is planned that the level of acvitity should be maintained during the present year.
  v) The ratios of cost to selling price are—raw materials 60%., direct wages 10%, and overheads 20%.
 vi) Raw materials are expected to remain in stores for an average of two months before these are issued for production.
vii) Each unit of production is expected to be in process for one month.
viii) Finished goods will stay in warehouse for approximately three months.
 ix) Creditors allow credit for 2 months from the date of delivery of raw materials.
  x) Credit allowed to debtors is 3 months from the date of dispatch.
 xi) Selling price per unit is Rs. 5.
xii) There is a regular production and sales cylce.

Prepare— a) working capital requirement forcast; and

b) an estimated Profit and Loss Account and Balance Sheet at the end of the year.

Solution :

Statement of Working Capital Requirement

A. Current Assets :	Amt. (Rs.)
Raw Materials (1,80,000/6)	30,000
Work in progress (1 month)	18,750
Finished goods (3 months)	67,500
Debtors (3 months) (2,70,000/4)	67,500
Total Current Assets	1,83,750
B. Current Liabilities :	
Creditors (2 months consumption of RM)	30,000
Net working capital (CA–CL)	1,53,750

Working Notes :

1. Computation of Cost and Sales for 60,000 units :

Sales @ Rs. 5 per unit	3,00,000
Cost of production :	
Raw Material (60% of 3,00,000)	1,80,000

Direct Wages @ Rs. 0.50 per unit	30,000
Overheads @ Rs. 1 per unit	60,000
Total Cost of Sales	2,70,000

2. Calculation of work in progress (1 month production) :

Raw material (Rs. 1,80,000/12)	Rs. 15,000
Direct Wages (Rs. 30,000/12)×50%	1,250
Overheads (Rs. 60,000/12)×50%	2,500
	18,750

The direct wages and overheads are assumed to have accrued evently through out the month. So, only 1/2 month wages and overheads are included in work in progress.

Projected Profit and Loss Account for the year ending Decmber 2009.

Sales (60,000×5)		Rs. 3,00,000
–Raw material @ 60%	Rs. 1,80,000	
–Direct Wages @ 10%	30,000	
–Overheads @ 20%	60,000	2,70,000
Gross Profit		30,000
–Debenture Interest @ 5% on 50,000		2,500
New Profit		27,500

Projected Balance Sheet as on Dec. 31, 2009

Liabilites	Amt. (Rs.)	Assets	Amt. (Rs.)
Share capital	2,00,000	Fixed assets	1,25,000
Profit and Loss A/c (Bal. Fig.)	8,750	Raw materials	30,000
Profit for the year 2009	27,500	Finished goods	67,500
5% Debentures	50,000	Work-in-progress	18,750
Creditors	30,000	Debtors	75,000
	3,16,250		3,16,250

Illustration 12

Prepare an estimate of net working capital requirement for the WCM Ltd. adding 10% for contingencies from the information given below :

Estimated cost per unit of production Rs. 170 includes raw materials Rs. 80, direct labour Rs. 30 and overheads (exclusive of depreciation) Rs. 60. Selling price is Rs. 200 per unit. Level of activity per annum 1,04,000 units. Raw materials in stock : average 4 weeks; work-in-progress (assume 50% completion stages) : average 2 weeks; finished goods in stock : average 4 weeks; credit allowed by suppliers ; average 4 weeks; credit allowed to debtors : average 8 weeks; lag in payment of wages : average 1.5 weeks, and cash at bank is expected to be Rs. 25,000. You may assume that production is carried on evenly throughout the year (52 weeks) and wages and overheads accrue similarly. All sales are on credit basis only. You may state your assumptions, if any.

Solution :

<h3 style="text-align:center">Statement of Working Capital Requirement</h3>

A. Current Assets :		Rs.	Rs.
i)	Raw materials in stock	(1,04,000×80×4)/52	6,40,000
ii)	Work-in-progress :		
a)	Raw materials	(1,04,000×80×2)/52	3,20,000
b)	Direct Labour	50% of (1,04,000×30×2)/52	60,000
c)	Overheads	50% of (1,04,000×60×2)/52	1,20,000
iii)	Finished Good Stock	(1,04,000×170×4)/52	13,60,000
iv)	Debtors	(1,04,000×170×8)/52	27,20,000
v)	Cash at Bank		25,000
	Total Current Assets		52,45,000
B. Current Liabilities :			
i)	Creditors	(1,04,000×80×4)/52	6,40,000
ii)	Wages (Lag-in-payment) :	(1,04,000×30×1½)/52	90,000
	Total current liabilities :		7,30,000
Net Working Capital (CA–CL)			45,15,000
	+ 10% Contingencies		4,51,500
	Working Capital Requirement		49,66,500

Assumptions : Net working capital requirement has been estimated on cash cost basis. Hence, investment in debtor has been computed on cash cost.

Illustration 13

Gulfam Ltd. is presently operating on single shift basis and has the following cost structure (per unit) :

Selling Price Rs. 36	Raw Materials	Rs. 12
	Wages (60% Variable)	Rs. 10
	Overheads (20% Variable)	Rs. 10
		Rs. 32

For the year ending March, 31, 2009; the sales amounted to Rs. 8,64,000 and the current asset position on that day was as follows :

Raw material	Rs. 72,000
Finished Goods	1,44,000
Working in progress (Prime Cost)	44,000
Debtors	2,16,000

At present the company receives a credit of 2 months from the Supplier of raw materials and Wages & expenses are payable with a time lag of half a month.

In order to meet the extra demand, the company is preparing to work in double shift. The increase production will enable the firm to get a 10% discount from the supplier of raw materils. There will not be any change in fixed cost, credit policy etc.

Ascertain the effect on requirement for working capital if the proposal of double shift materializes.

Solution :

In order to calculate the working capital requiement for double shift operations, the existing parametres should be ascertained as follows :

Present Position : Sales (Rs. 8,64,000÷36) = 24,000 Units of 2,000 units per month

Debtors : (2,16,000÷8,64,000)×12 = 3 months Outstanding.

Raw Material : (72,000 ÷ 12)=6,000 Units or 3 months requirement.

Work in Process : (44,000 ÷ 22)=2,000 Units or 1 months

Finished Goods : (1,44,000÷32) = 4,500 units or 2.25 months requirement.

New Cost of Raw Material : Rs. 12–10% of 12 = Rs. 10.80

Working Capital Requirement

Single Shift (Present Position)		Double Shift (Proposed Position).	
Current Assets	**Amont**	**Current Assets :**	**Amount**
Raw Materials (Given)	72,000	Raw Material (4,000×3×10.80)	1,29,600
Work in process (Given)		Work in process (4,000×20.80)	83,200
(2000×22)	44,000	Finished Goods (4,000×2.25×30.80)	2,77,200
Finished Goods (Given)	1,44,000	Debtors at cost (4,000×3×30.80)	3,69,600
Debtors at cost (2,000×3×32)	1,92,000		
Total Current Assets :	4,52,000	Total Current Assets :	8,59,600
Less Current Liabilities :		Less Current Liabilities :	
Creditors : (2,000×12×2)	48,000	Creditors (4,000×10.80×2)	86,400
Wages & Expenses			
(2,000×20×½)	20,000	Wages & Expenses (4,000×20×½)	40,000
Working Capital Requirement	3,84,000	Working Capital Requirement	7,33,200

So, the Working Capital requirement will increase by (Rs. 7,33,200–3,84,000) = Rs. 3,49,200 due to change from single shift to double shift operations.

CASH MANAGEMENT PROBLEMS AND SOLUTIONS

Illustration 1

United Industries Ltd. projects that cash outlays of Rs. 37,50,000 will occur uniformly throughout the coming year. United plans to meet its cash requirements by periodically selling marketable securities from its portfolio. The firm's marketable securities are invested to earn 12% and the cost per transaction of converting securities to cash is Rs. 40.

  a. Use the Baumol Model to determine the optimal transaction size of marketable securities to cash.
  b. What will be the company's average cash balance?
  c. How many transfers per year will be required?
  d. What will be the total annual cost of maintaining cash balances?

Solution :

a) Optimal size = $\sqrt{2TA/I}$ = $\sqrt{(2 \times 40 \times 37,50,000)/0.12}$ = 50000

b) average cash balance = Rs 25000

c) No of transactions per year = 3750000/50000 = 75

d) Total annual cost

Transaction cost	75×40	=	3000
Opportunity cost	50000×1/2×12%	=	3000
			6000

Illustration 2

The Cyberglobe Company has experienced a stochastic demand for its product. With the result that cash balances fluctuate randomly. The standard deviation of daily net cash flows is Rs. 1,000, The company wants to impose upper and lower bound control limits for conversion of cash into marketable securities and vice-versa. The current interest rate on marketable securities is 6%. The fixed cost associated with each transfer is Rs. 1,000 and minimum cash balance to be maintained is Rs. 10,000.

Compute the upper lower limits.

Solution :

Standard Deviation = 1000

Variance = 1000 x 1000 = 1000000

Interest = 6% / 365 = 0.016%

T = 1000

L = 10000

$Z = \sqrt[3]{(3TV / 4I)} = \sqrt[3]{(3 \times 1000 \times 1000) / (4 \times 0.016\%)}$

$\qquad$ = 3573

Return point = Z + L

3573 + 10000 = 13573

Upper limit = 3R -2L

40719 – 20000 = 20719

RECEIVABLES MANAGEMENT

PROBLEMS AND SOLUTIONS

Illustration 1

The following are the details regarding the operations of a firm during a period of 12 months.

Sales   Rs.12,00,000

Selling price per unit   Rs.10

Variable cost price per unit Rs. 7

Total cost per unit   Rs. 9

Credit period allowed to customers one month. The firm is considering a proposal for a more liberal extension of credit which will result in in-creasing the average collection period from one month to two months. This relaxation is expected to increase the sales by 25% from its existing level.

You are required to advise the firm regarding adoption of the new credit policy, presuming that the firm's required return on investment is 25%.

Solution :

Appraisal of Credit policy

	Present	Proposed	Incremental
Credit period (ACP)	1 month	2 months	
Sales (units)	120000	150000	
Sales @ 10 (in Rs)	1200000	1500000	300000
Total Cost	1080000	1290000	210000
Profit	120000	210000	90000

Investment in receivables   1080000 / 12 = 90000

1290000 / 6 =   215000   125000

Required return on Incremental Investment (125000@ 25%) = 31250

Actual return on Investment = 90000

(or)

(90000 / 125000) x 100   = 72%

Since the Incremental return is greater than required return on Incremental investment advised to adopt new credit policy

Illustration 2

YASHWANTH Ltd. has received an order from Green Ltd. which insists that the Rs.50,000 of machinery ordered be supplied on 60 days credit. The variable costs of production which would be incurred by YASHWANTH Ltd. in meeting the order amount to Rs.40,000. Green's credit worth whileness is in doubt and the following estimates have been made:

Probability of Green Ltd. paying in full in 60 days 0.6

Probability of Green Ltd. completely defaulting   0.4

However, if the order is accepted by YASHWANTH Ltd. and if Green Ltd. does not default, then there is felt to be a probability of about 0.7 that a further eight identical orders will be placed by Green Ltd. in exactly 1 year's time, and further orders in later years may also be forth coming. Experience has shown that once a firm meets the credit terms on an initial order, the probability of default in the next year reduces to 0.1. Any work carried out on Green's Ltd. order would take place in otherwise idle time and would not encroach upon YASHWANTH Ltd. other activities. Should Green Ltd. defaults, the legal and other costs of debt collection would equal any money obtained.

YASHWANTH Ltd. finances all trade credit with readily available overdrafts at a cost of 12% p.a. An appropriate discount rate for long term decisions is 15%p.a.

Evaluate the proposal if (i) only one order is expected from Green Ltd., and (ii) if further orders are also expected from it (year may be taken consisting of 360 days)

Solution :

<div align="center">

YASHWANTH LTD

Evaluation of credit decision

</div>

I. If only one order is expected from GREEN Ltd

If Amount received in full in 60 days

Selling price	50000
(-) variable cost	40000
	10000
(-) finance cost	800
(40000@12%) × (60 / 360)	
Net profit	9200

If GREEN Ltd defaulted

Loss =		50000

Expected return :

If paid in 60 days	9200 × 0.6	5520
If defaulted	50000 × 0.4	(20000)
		(14480)

If only one order is received from Green Ltd, it need not be accepted by YASHWANTH Ltd, Because net receipt is negative

II. If further Orders are expected from GREEN Ltd

Net return from each order (if not defaulted)	9200
For 8 orders	73600
Return expected if defaulted	(400000)
Net expected return from further orders	
[(73600 x 0.9) + (-400000) x (0.1)]	26240
PV of expected return from further orders	
[26240 x (0.7) x (100 / 115)]	15970
Revised value of order [15970 + (-14480)]	1490

Revised value of initial order on the basis of possibility of receiving further orders is Rs1490. so proposal is to be accepted.

Illustration 3

Trinadh Traders Ltd. currently sells on terms of net 30 days. All the sales are on credit basis and average collection period is 35 days**.** Currently, it sells 500,000 units at an average price of Rs. 50 per unit. The variable cost to sales ratio is 75% and a bad debt to sales ratio is 3%. In order to expand sales, the management of the company is considering changing the credit terms from net 30 to 2/10, net 30. Due to the change in policy, sales are expected to go up by 10%, bad debt loss on additional sales will be 5% and bad debt loss on existing sales will remain unchanged at 3%. 40% of the customers are expected to avail the discount and pay on the tenth day. The average collection period for the new policy is expected to be 34 day's: The company required a return of'20% on its investment in receivables.

You are required to find out the impact of the change in credit policy on the profit of the company. Ignore taxes.

Solution :

Trinadh Traders

Appraisal of Credit policy :

	Present	Proposed	Gain / (loss)
Credit terms	Net30	(2 / 10)Net 30	
ACP	35 days	34 days	
Discount sales	-	40%	
Bad debts	3%	3 % + 5%	
Sales	500000	550000	
Incremental Profit [50000 x 50 x 25%]		625000	
Incremental bad debts [50000 x 50 x 5%]		(125000)	
Discount [550000 x 40% x 50x 2%]		(220000)	

Investment [500000 x 50 x (35/360)]   = 2430555 [500000 x 50 x (37/365)] + [50000 x 50 x 75% x 34/360] = 2538194

		107629
Finance cost	(107629 x 20%)	(21528)
	258472	

By implementing new credit policy, the profit is increased by Rs258472.   So the new credit policy is advised to implement.

Illustration 4

A small firm has a total sales of Rs. 100 lakhs, of which 80% is on credit. It is offering a discount-credit terms of 2/40 Net 30. Of the total, 50% of customers avail of discount and the balance pay in 120 days. The past experience indicates that bad debt losses are around 1% of credit sales. The firm spends about Rs. 1,20,000 per annum to administer its credit sales. These are avoidable as a factor is prepared to buy the firm's receivables. He will charge 2% commission. He will also pay advance against receivables to the firm at an interest rate of 18% after withholding 10% as reserve. Answer the following :

- a)   What is the total credit sales?
- b)   What is the average collection period?
- c)   What is the average receivables?
- d)   What is the factoring commission payable per annum?
- e)   What is the disbursable amount to the firm by the factor?
- f)   What is the total interest chargeable by the factor?
- g)   What is the cost of factoring?
- h)   Should the firm avail factoring services?

Solution :

			(Rs.)
a)	Total credit sales (100lakhs x 80%)		8000000
b)	Average collection period [(40x 0.5) + (120 x 0.5)]		80 days
c)	Average debtors (80lakhs x 80 / 360)		1777778
d)	Factoring commission (80lakhs x 2%)		160000

e)   Disbursable amount

Average receivables	1777778	
(-) Factor reserve @10%	177778	
	1600000	
(-) Commission (1777778 x 2%)	35554	
		1564446

f)   Total interest

Interest for 80 days [1564446 x18% x (80 / 360)]	62578	
Interest per year [62578 x (360 / 80)]	281600	

g)   Effective cost of factoring

Commission	160000
Interest	281600
	441600
(-) savings in	
Bad debt	80000
Admin cost	120000
Effective cost	241600

Effective cost of factoring (241600 / 1564446) x 100 = 15.4 %

h) If the firm obtain funds less than 15.4% interest rate, then firm need not accept factoring services. Otherwise advised to accept factoring.

Illustration 5

The turnover of Modern Ltd. Is Rs. 60 lakhs of which 80% is on credit. Debtors are allowed on month to clear off the dues. A factor is willing to advance 90% of the bills raised on credit for a fee of 2% a month plus a commission of 4% on the total amount of debts. Modern Ltd. As a result of this arrangement is likely to save Rs. 21,600 annually in management costs and avoid bad debts at 1% on the credit sales.

A scheduled bank has come forward to make an advance equal to 90% of the debts at an interest rate of 18% p.a. However its processing fee will be at 2% on the debts. Would you accept factoring or the offer from the bank?

Solution :

Factoring vs. Bill Discounting:

Alternative 1: Factoring:

Calculation of Effective Cost of Factoring:

Sale for the year	6000000
Credit sales	4800000

Receivables = (4800000 / 12) x 1 month = 400000

Cost of factoring: (Per month)

Fee (interest) 400000 x 90 % x 2% = 7200

Commission   400000 x 4% = **16000**

Cost per month	23200

Savings:

Management cost (21600 / 12)	(1800)
Bad debts (400000 x 1%)	**(4000)**
	17400

Alternative 2: Bill Discounting :

Cost of Bill Discounting

Average debtors – 400000p.m

Processing Fee	8000
(400000 x 2 %)	
Interest / Discount	5400
[400000@90% x 18% x (1 /12)]	
Loss due to bad debts p.m	4000
Administration cost	**1800**
	19200

Company may Opt Factoring but not Bill discounting.

2.6 Financial Services

This Section includes :

- **Leasing**
- **Hire Purchase**
- **Forfeiting**
- **Bill Discounting**
- **Factoring**
- **Asset Securitization**

INTRODUCTION :

With the sea change in the complex business environment, financial services play a pivotal role in facilitating the smooth flow of the entire financial system.

Financial services include :

(a) Leasing
(b) Hire-Purchase
(c) Forfeiting
(d) Bill Discounting
(e) Factoring
(f) Asset Securitization

LEASING :

A lease is an agreement whereby the lessor conveys to the lessee in return for a payment or series of payments the right to use an asset for an agreed period of time. It may be defined as:

(a) A contractual agreement between the lessor (owner of an asset/equipment) and the lessee (the user of such asset / equipment);

(b) Which provides a right to the user of the asset, over a certain agreed period of time;

(c) Against a consideration, lease rentals.

HIRE PURCHASE :

A hire purchase is a contractual agreement under which the owner lets his goods on hire to the hirer and offers an option to the hirer for purchasing the goods in accordance with the terms of the agreement. It has two aspects:

(a) Bailment of goods subject to the hire purchase agreement;

(b) There is an element to sale when the option to purchase the goods is exercised by the hirer (i.e.,the user).

Features of Hire Purchase Agreement :

(a) Hiree (lessor) provides his assets to the hirer(lessee)for use

(b) Hirer pays regular hire purchase instalments-including interest and principal.

(c) That the ownership is transferred to the hirer (user) only after the payment of the last installment.

FORFEITING :

The term **"a forfait"** in French means, **"relinquish a right".** It refers to the exporter relinquishing his right to a receivable due at a future date in exchange for immediate cash payment, at an agreed discount, passing all risks and responsibilities for collecting the debt to the forfeiter.

It is the discounting of international trade receivable on a 100% "Without recourse" basis. "Without recourse " means the client gets full credit protection and all the components of service, i.e., short-term finance, administration of sales ledger are available to the client.

Forfeiting transforms the supplier's credit granted to the importer into cash transaction for the exporter protecting him completely from all the risks associated with selling overseas on credit. It effectively transforms a credit sale into a cash sale.

Procedure

(a) The exporter sells the goods to the importer on a deferred payment basis spread over 3-5 yeaRs.

(b) The importer draws a series of promissory notes in favour of the exporter for the payments to be made inclusive of interest charges.

(c) Such promissory notes are availed or guaranteed by a reputed international bank which can also be the importer's banker. (it is endorsement on the promissory note by the guaranteeing bank that it covers any default of payment of the buyer).

(d) The exporter now sells the availed notes to a forfeiter (which may be the exporter's banker) at a discount without a recourse.

(e) The forfeiter may hold these notes till maturity or sell them to group of investors interested in taking up such high-yielding unsecured paper.

Graphical representation of forfeiting

1 = Promissory notes sent for availing to the importer's banker

2 = Availed notes returned to the importer

3 = Availed notes sent to exporter

4 = availed notes sold at a discount to a forfeiter on a non - recourse basis

5 = exporter obtains finance

6 = forfeiter holds the notes till maturity or securities these notes and sells the short-term paper either to a group of investors or to investors in the secondary market.
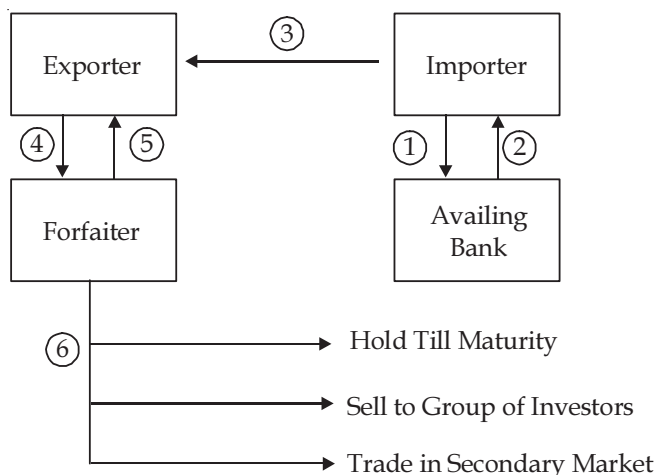
BILL DISCOUNTING :

It is the process of discounting the trade finance bills by the drawer or the holder of the bill.

There are four types of trade finance bills:

(a) Trader's bill - (i) a seller supplies goods and raises the bill for the value of goods sold; (ii) the buyer accepts the bill (iii) the seller receives the accepted bill and discounts it with the seller's banker (iv) the buyer honours the bill on due date.

(b) Bills with co-acceptance - (i) a seller supplies goods and raises the bill for the value of goods sold; (ii) the buyer accepts the bill (iii) the buyer's bank also co-accepts the bill, (iv) the seller receives the accepted bill and discounts it with the seller's banker.

(c) Bills accompanied with Letter of Credit (LC) - (i) a seller supplies goods and raises the bill for the value of goods sold; (ii) the buyer accepts the bill (iii) the buyer's bank opens the LC in favour of the seller and discounts the same with seller's bank.

(d) Drawee Bills - (i) a seller supplies goods and raises the bill for the value of goods sold; (ii) the buyer accepts the bill (iii) the buyer's bank discounts the bill for the account of the buyer.

FACTORING :

Factoring is an arrangement in which a financial intermediary called "factor" collects the accounts receivables on behalf of the goods and services. The factor charges a fee that is usually expressed as a percentage of the total value of the receivables factored.

Factors, are usually subsidiaries of banks or private financial companies, generally, renders the following services:

(a) purchasing the accounts receivable of the seller for immediate cash;

(b) administering the sales ledger of the seller;

(c) collects the accounts receivable;

(d) forecasts the losses which may arise due to bad debts;

(e) advisory services to the seller.

Factoring is an alternative to in-house management of receivables.
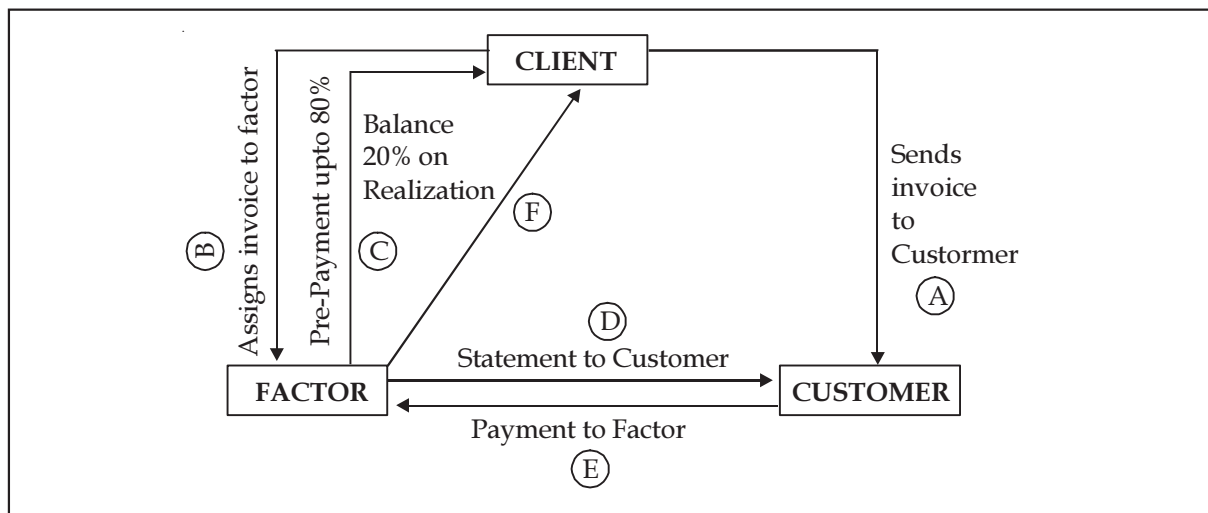
How Factoring works

(a) seller raises the bill on the customer and issues a notification that the invoice is assigned to and must be paid to the factor.

(b) Copies of invoice sent to the factor

(c) Factor will provide pre-payment of upto a maximum of 80% of the total invoice value

(d) Follow up procedure with the customers for realization of payments due

(e) Balance payment is made on realization of dues

(f) Seller will be informed of factor invoices through monthly statement of account sent by the factor.

Types of Factoring

(a) Recourse factoring: the factor purchases the receivables on the condition that any loss arising out of irrecoverable debts will be borne by the seller/client.

(b) Non-recourse or full factoring: the client gets full protection and all the components of service.

(c) Advance factoring or maturity factoring: no advance or prepayment is made by the factor. The payment is made to the client either on a guaranteed payment date or on the date of collection from the customer.

(d) Invoice discounting: the factor provides a prepayment to the client against the purchase of account receivables and collects interest (Service charges) For the period extending from the date of prepayment to the date of collection. The administration and collection charges shall be borne by the client.

(e) Undisclosed factoring: companies of a very high repute and sound financial base can opt for this type of factoring. Here, the client's customers are not notified of the factoring agreement and they continue to make the payment to the client. The client bears the responsibility of making payment to the Factor on the due date, irrespective of realizations from the customeRs.

Factoring is not advisable in the following situations

(a) Where sales are made for cash;

(b) In case of speculative business;

(c) For highly specialized capital equipments or goods made-to-order ;

(d) If the credit period is more than 180 days;

(e) In case of "consignment sale" or "sale or return arrangements" ;

(f) Sales to associated companies;

(g) Sales are made to public at large.

Factoring Vs. Forfeiting

Factoring	Forfeiting
1. 80% of the invoice value is considered for advance	1. 100% financing
2. Factor does the credit rating of the counterpartly in case of non-recourse factoring	2. The forfeiting bank relies on the credibility of the availing bank
3. Day to day administration of sales and other allied services are provided	3. No additional services are provided
4. Advances are generally short-term in nature	4. Advances are generally medium-term in nature.

ASSET SECURITIZATION :

Asset Securitization is the process by which non-tradable assets are converted into tradable securities. Assets like mortgage loans receivables, cash credit receivables, etc. on the balance sheet of use originator (say, Housing Finance companies, financial industries, etc) are packaged, underwritten and sold in the form of securities to investors through a carefully structured process. These securities may be in the form of commercial paper, Certificate of Deposits, Notes or any other form of security permissible under the legal framework in the country.

Benefits to the Investor

The investor gets a security, which is backed by adequate collateral security and has credit enhancement. Those securities are rated by the credit rating agencies.

Asset Securitization Process

(a) The originator, owing the assets, identifies a pool of homogeneous assets, which is held for securitization.

(b) The pool of assets is then transferred to a different entity, known as Special Purpose Vehicles (SPV).

(c) The SPV issues the securities backed by the pool of assets. They also indicates the liability for the cash consideration received from the investoRs.

(d) The consideration is remitted by the SPV to the originator, which then replaces the securitized assets from its balance sheet with the consideration received.

Factoring Vs Securitization

Factoring	Securitization
1. One party involved	1. Generally a wide range of investors are involved
2. May be done with or without recourse	2. Done without recourse
3. Payment from the factor is received after a time lag	3. Cash is generally received as soon as the issue is placed
4. Additional services like credit checking, ledger maintenance are offered	4. No such additional services are offered.
5. Short term receivables are factored	5. Long term receivables are securitized
6. Credit rating is not compulsory	6. Credit rating is compulsory
7. Existing receivables can be factored	7. Along with existing receivables, future receivables can also be securitized.

Illustration 1

DLP Pvt. Ltd. is considering the possibility of purchasing a multipurpose machine which cost Rs. 10.00 Lakhs. The machine has an expected life of 5 yeaRs. The machine generates Rs. 6.00 lakhs per year before Depreciation and Tax, and the Management wishes to dispose the machine at the end of 5 years which will fetch Rs. 1.00 lakh. The Depreciation allowable for the machine is 25% on written down value and the Company's Tax rate is 50%. The company approached a NBFC for a five year Lease for financing the asset which quoted a rate of Rs. 28 per thousand per month. The company wants you to evaluate the proposal with purchase option. The cost of capital of the Company is 12% and for Lease option it wants you to consider a discount rate of 16%.

	0	1	2	3	4	5
PV 12%	1.000	0.893	0.797	0.712	0.636	0.567
PV 16%	1.000	0.862	0.743	0.641	0.552	0.476

Solution :

I Purchase : (Rs. Lacs)

Particulars	0	1	2	3	4	5
Initial outlay/Op.	(10)	—	—	—	—	—
Profit	6.00	6.00	6.00	6.00	6.00	6.00
Less : Depreciation	—	2.50	1.88	1.40	1.06	0.79
Profit before tax		3.50	4.12	4.60	4.94	5.21
*Less:*Tax @ 50%		1.75	2.06	2.30	2.47	2.60
Profit after tax		1.75	2.06	2.30	2.47	2.61
*Add:*Depreciation		2.50	1.88	1.40	1.06	0.79
Salvage value of machine		......	......	....	.....	1.00
Net cash Inflow		4.25	3.94	3.70	3.53	4.40
Present value factor @ 12%	1.00	.893	.797	.712	.636	.567
Present values	(10)	3.80	3.14	2.63	2.25	2.49

NPV of purchase option is Rs. 4,31,000

II Lease : (Rs. lacs)

Particulars	1	2	3	4	5
Operating profit	6.00	6.00	6.00	6.00	6.00
Less : Lease Rent	3.36	3.36	3.36	3.36	3.36
Profit before tax	2.64	2.64	2.64	2.64	2.64
Tax @ 50%	1.32	1.32	1.32	1.32	1.32
Profit after tax	1.32	1.32	1.32	1.32	1.32
Discount factor @16%	0.862	0.743	0.641	0.552	0.476
Present values	1.14	0.98	0.85	0.73	0.63

The net present valu of lease option is Rs. 4,33,000.

Analysis : From the analysis of the above we can observe that NPV of lease option is more than that of purchase option. Hence, lease of machine is recommended.

Illustration 2 :

Agrani Ltd. is in the business of manufacturing bearings. Some more product lines are being planned to be added to the existing system. The machinery required may be bought or may be taken on lease. The cost of machine is Rs. 40,00,000 having a useful life of 5 years with the salvage value of Rs. 8 lakhs. The full purchase value of machine can be financed by 20% loan

repayable in five equal installments falling due at the end of each year. Alternatively, the machine can be produced on a 5 year lease, year end lease rentals being Rs. 12,00,000 per annum. The company follows the WDV method of depreciation at the rate of 25%. Company's tax rate is 35% and the cost of capital is 16%.

(i) Advice the company which option is should be −lease or borrow

(ii) Assess the proposal from the lessor's point of view examining whether leasing the machine is financially viable at 14% cost of capital.

(Detailed working notes to be given. Calculations can be rounded off to lakhs).

Solution :

Evaluation from the point of view of Leassee :

Lease option :

Lease Rental after tax- 12,00,000 ×(1 - 0.35) = Rs. 7,80,000

PVIFA (13%, 5) = 3.517

PV of Lease Rentals (7,80,000 × 3.517) = Rs 27,43,260

Borrrowing Option :

In this case, the loan is repayble in 5 equal installments. This includes interest also. So, the payment to be made every year is Rs. 40,00,000÷2.991 = Rs. 13,37,345. Now, the borrowing option can be evaluated as follows : (Disc Rate = 20×(1–0.35) = 13%]

Year	Payment	Tax benefit		Net Cash Outflow	$PVF_{(13,n)}$	Total
		On Int.	**On Dep.**			
1	13,37,345	2,80,000	3,50,000	7,07,345	0.885	6,26,000
2	13,37,345	2,42,386	2,62,500	8,32,459	0.783	6,51,815
3	13,37,345	1,97,249	1,96,875	9,43,221	0.693	6,53,652
4	13,37,345	1,43,085	1,47,656	10,46,604	0.613	6,41,568
5	13,37,345	78,087	1,10,742	11,48,516	0.543	6,23,644
	Total PV of Outflows					31,96,680
	Less : PV of Salvage value (8,00,000×0.543)					4,34,400
	PV of tax benefit on m/c sold at loss (WN 2) (149219×0.35×0.543)					28,359
	Net present value of cash outflows					27,33,921

As the PV of cash outflows of lease option is greater than of borrowing option, the borrowing option is recommended.

Working Notes :

1. Debt and Interest Payments

Year	Loan Installments	Loan in the beginning of the year	Interest	Principal	Balance at the end of year
1	13,37,345	40,00,000	8,00,000	5,37,345	34,62,655
2	13,37,345	34,62,655	6,92,531	6,44,814	28,17,841
3	13,37,345	28,17,841	5,63,568	7,73,777	20,44,064
4	13,37,345	20,44,064	4,08,813	9,28,532	11,15,532
5	13,37,345	11,15,532	2,23,106	11,14,239	....

2. Loss on Sale of Machine

BV at the end of 5 years	9,49,219
SP of machine	8,00,000
Loss	1,49,219

From the View Point of Lessor :

From point of view of lessor, it is a capital buddgeting problem and can be analyzed as follows :

	Year 1	Year 2	Year 3	Year 4	Year 5
	Rs.	Rs.	Rs.	Rs.	Rs.
Lease Rentals	12,00,000	12,00,000	12,00,000	12,00,000	12,00,000
Less : Dep.	10,00,000	7,50,000	5,62,500	4,21,875	3,16,406
Profit Before Tax	2,00,000	4,50,000	6,37,500	7,78,125	8,83,594
Less : Tax @ 35%	70,000	1,57,500	2,23,125	2,72,344	3,09,258
Profit After Tax	1,30,000	2,92,500	4,14,375	5,05,781	5,74,336
+ Depreciation	10,00,000	7,50,000	5,62,500	4,21,875	3,16,406
Cash flows	11,30,000	10,42,500	9,76,875	9,27,656	8,90,742
PVIFA @ 14%	0.877	0.760	0.675	0.592	0.519
P.V. of Cash Flows	9,91,010	7,92,300	6,59,391	5,49,172	4,62,295
Total P.V.					34,54,168
Add : PV of Tax saving on sale of asset		[149219×0.35×0.519 = 27106]			27,106
Total PV of cash inflow					34,81,274
Cost of Machine					40,00,000
NPV					**(5,18,726)**

Advice : Lease is not financially viable and is not recommended.

Illustration 3 :

ABC Ltd. is considering to buy a machine costing Rs. 1,10,000 Payable Rs. 10,000 down payment and balance in 10 installments inclusive of interest chargeable at 15%. Another option before it is to acquire the assets on a lease rental of Rs. 15,000 per annum for 10 yeaRs. As a financial managers, decide between these two options so that :

  i. Scrap value of Rs. 20,000 is realizable if the asset is purchased.

  ii. The firm provides 10% depriciation on SLM on the original cost

  iii. The tax rate is 50% and the after tax cost of capital is 15%.

Solution :

Option I—BUY

In this option the firm has to pay Rs. 10,000 down and the balance Rs. 1,00,000 together with interest @ 15% is payble in 10 annual equal installments. The annuity amount may be calculated for 10 years at 15%, as i.e.,

Annual repayment = Rs. 1,00,000/5.019 =   Rs. 19,925.
The cash flows of the interest in the purchase option may be calculated as follows :

Year	Installment Rs.	Interest Rs.	Repayment Rs.	Balance Rs.
1	19,925	15,000	4,925	95,075
2	19,925	14,261	5,664	89,411
3	19,925	13,412	6,513	82,898
4	19,925	12,435	7,490	75,408
5	19,925	11,311	8,614	66,794
6	19,925	10,019	9,906	56,888
7	19,925	8,533	11,392	45,496
8	19,925	6,824	13,101	32,395
9	19,925	4,859	15,066	17,329
10	19,925	2,596	17,329	—

The PV of Cash outflows may now be found as follows :

Year	Payment	Interest	Dep.	Tax	Net CF	PVF	PV
				Shield 50%	(1-4)		
	Rs.	Rs.	Rs.	Rs.		Rs.	
0	10,000	–	–	–	–	1,000	10,000
1	19,925	15,000	11,000	13,000	6,925	.870	6,025
2	19,925	14,261	11,000	12,631	7,294	.756	5,514
3	19,925	13,412	11,000	12,206	7,719	.658	5,079
4	19,925	12,435	11,000	11,718	8,207	.572	4,694
5	19,925	11,311	11,000	11,156	8,769	.497	4,358
6	19,925	10,019	11,000	10,510	9,415	.432	4,067
7	19,925	8,533	11,000	9,767	10,158	.376	3,819
8	19,925	6,824	11,000	8,912	11,013	.327	3,601
9	19,925	4,859	11,000	7,930	11,995	.284	3,407
10	19,925	2,596	11,000	6,798	13,127	.247	3,242
	Present value of total outflows						53,806
	Salvage value (after tax)				10,000	.247	–2,470
	Net present value of outflows						51,336

(i) Depreciation of 10% i.e. Rs. 11,000 has been provided for all the yeaRs.

(ii) The asset is fully depreciated during its life of 10 years, therefore, the book value at the end of 10th year would be zero. As the asset is having a salvage value of Rs. 20,000, this would be capital gain, and presuming it to be taxable at the normal rate of 50%, the net cash inflow on account of salvage value would be Rs. 10,000 only. This is further discounted to find out the present value of this inflow.

Option II - Evaluation of Lease Option. In case, the asset is acquired on lease, there is an annual lease rent of Rs. 15,000 payable at the end of next 10 yeaRs. This lease rental is tax deductible, therefore, the net cash outflow would be only Rs. 7,500 (after tax).

The PVAF for 10 years @ 15% is 5.019. So the present value of annuity of is. Rs. 7,500 × 5.019 = Rs. 37,643 .

Advice : The PV of outflows in case of a lease is lower. Therefore it is advisable to go for Leasing.

LESSOR'S PERSPECTIVE

Illustration 4

A request has been received by Lotus Finance Ltd. who are engaged in leasing business, for structuring a lease of a machine costing Rs. 30 lakhs. The average post-tax cost of funds to Lotus Finance (effective tax rate 50%) is 10%, but they wish to mark up this by 2% to cover the effects of inflation.

Calculate the annual lease rent to be charged assuming that

(a) the lease period is to be 5 years;

(b) the rents will be payable on the first day of each year ;and

(c) the machine will be fully depreciated in 5 yeaRs.

Solution :

Calculation of Depreciation Tax Shield :

Annual Depreciation = 30.00/5	=	Rs.6.00 lakhs
Annuity factor @ 12%for 5 years	=	3.61
PV of depreciation tax shield	=	(6.00 × 0.5) × 3.61 = Rs. 10.83 lakhs

Calculation of amount placed under finance. [Minimum PV to be recovered from lessee]

Cost of machine (Rs. in lakhs)	=	30.00
Less : PV of depreciation tax shelter	=	10.83
Total	=	19.17

Calculation of Annual Lease Rent :

The Annuity factor @ 12%(for amount receivable at the beginning of the year)

= 1+ 0.82+0.80+0.71+0.64 = 3.97 [Note: We begin with the first PV for year zero =1] Let the Annual rent be L,

If Rs. 19.17 lakhs is to be recovered, then using the same steps as given in the earlier problem L × 0.5 × 3.97 = 19.17

   or L = 9.66

Therefore Annual Lease rent (payable at the beginning of the year) is Rs. 9.66 lakhs.

Illustration 5

A lessor has an equipment for Rs. 1,00,000. It has a five-year life and lease will be for 5 yeaRs. The projected salvage value is Rs.10,000 and to be discounted at 25% owing to higher rate of uncertainty connected to the estimate. The company is earnings 10% (after tax) on its marginal investments. Hence, a 10% discount rate is to be used in computing present value of lease financing.

Determine the annual lease payments if made

(i) at the start of each year, and

(ii) at the end of each year.

Solution :

The salvage value will remain same under both options:i.e. Rs. 10,000.

This is to be discounted at 25%. So the present value of the salvage value is

$$= \text{Rs. } 10,000 \times \text{PVF}_{(25\%.5y)}$$

$$= \text{Rs. } 10,000 \times 0.328$$

$$= \text{Rs. } 3280$$

Calculation of Lease Rental :

Lease rentals have to be decided in such a way that net of purchase cost and salvage value recipt is recovered. Amount of recovery for the purpose of calculation of lease rental:

Rs. 1,00,000 - Rs. 3280 = Rs. 96,720.

(i)   **If lease rental is payable in the beginning:**

Let the lease rentals payable be Rs. L.

Rs. 96,720 = L × 1.00 + L × PVIFA (10%,4)

Rs. 96,720 = L + 3.170L

Rs. 96,720 = 4.170L

Therefore L = Rs. 23,194

(ii)   **If lease rental is payable at the end of the year :**

Let the lease rentals payable be Rs. L.

Rs. 96,720 = L × PVIFA (10%, 5)

Rs. 96,720 = 3.791L

Therefore L = Rs. 25,513

Illustration 6

Kuber Leasing Ltd. is in the process of making out a proposal to lease certain equipment to a user - manufacturer. The cost of the equipment is expected to be Rs. 10 lakhs and the primary period of lease to be 10 year Rs. Kuber Leasing is able to give you the following additional information.

(a) The machine can be depreciated fully over the 10 years on straight line basis (assume this to be acceptable for IT purposes) (b) The currrent effective tax rate for Kuber Leasing is 40% and they expect to go down to 30% from the beginning of the 6th year of the lease (c) It is the normal objective of Kuber to make a 10% post - tax return in its lease pricing (d) Lease

management fee of 1% of the value of the asset is usually collected from the lessees upon signing of the contract of lease, to cover the overhead costs related to processing of the signing of the contract of lease, to cover the overhead costs related to processing of the proposal (e) Annual lease rents are collected at the beginning of every year.

You are required to determine the equated annual rent to be charged for the proposal.

Solution :

Calculation of Depreciation Tax Shied :

Annual Depreciation = 10.00/10	= Rs. 1.00 Lakh
Annuity factor @ 10% for 1-5 years	= 3.79
Annuity factor @ 10% for 6-10 years	= 2.35
PV of depreciation tax shield :	
$(1.00 \times 0.4) \times 3.79 + (1.00 \times 0.3) \times 2.35$	= Rs. 2.22 lakhs
Calculation of amount placed under finance:	
Cost of machine (Rs. in lakhs)	= 10.00
Less: PV of depreciation tax shield	= 2.22
Total	= 7.78

Note : Lease management fee of 1% is collected to cover the overhead costs related to processing of the signing of the contract of lease. This amount would not be taken into account for recovering from lessee.

Calculation of Annual Lease Rent:

Let the Annual rent be L,

The annuity factor @ 10% for 0-5 years = 4.79

The annuity factor @ 10% for 6-9 years = 1.96

If Rs. 7.78 lakhs is to be recovered, then

$(L \times 0.6) \times 4.79 + (L \times 0.7) \times 1.96 = 7.78$ or L = 1.83

Therefore, equated Annual rent (payable at the beginning of thr year) is Rs. 1.83 lakhs.

Illustration 7

Fair Finance Ltd. is a hire purchase and leasing company who have been approached by a local small scale business interested in acquisition of a machine through leasing. The price quoeted by the manufacturer of the machine is Rs. 3,00,000, 10% Sales tax is extra. The proposed lessee desires to have a primary lease period of 5 years.

Fair Finance's target rate of return on the transaction is 8% post-tax on the outlay. They wish to fix annual lease rents which are to be payable in arrears at the end of each year. Their effective Income - tax rate is 50%. The Income - tax rate of depreciation on the machine is 25%.

Calculate the annual lease rent to be charged by Fair Finance Ltd.

Solution :

Calculation of amount placed under Finance :

	Calculation of Depreciation Tax Shield				
1	2	3	4	5	6
Year	Cost/WDV	Depreciation @ 25% on WDV	Tax Shield (3) × 50%	Discount factor @ 8%	Discounted cash flow
1	330000	82500	41250	0.93	38363
2	247500	61875	30938	0.86	26606
3	185625	46406	23203	0.79	18330
4	139219	34805	17403	0.74	12878
5	104414	26104	13052	0.68	8875
					105052

Cost of machine including Sales Tax   Rs. 330000
Less: Depreciation Tax Shield (PV)   Rs. 105052
                                                      Rs. 224948

Calculation of Annual Lease Rent:

Let Annual Lease Rent charged be   x
Annual Post tax recovery   0.5x
If Rs. 224948 is to be recovered, then the value of 'x' will be = 4 × 0.5× = 224948
                                    Or x = 112474

Therefore, Annual Lease Rent has to be Rs. 112474.

Illustration 8

Ugly finance a leasing company has been approached by a perspective customer intending to acquire a machine where cash down payment is Rs. 3 crores. The customer in order to leverage his tax position has requested a quote for three year lease with rentals payable at the end of each year but in a diminishing manner such that are in the ratio of 3:2:1.

Depreciation can be assumed to be on straight line basis and Ugly Finance's marginal tax rate is 35%. The target rate of return for Ugly Finance on the transaction is 10%. Calculate lease rental to be quoted for lease of three years.

Solution :

Calculation of Depreciation Tax Shield :

Annual Depreciation = 3 crores/3   = Rs. 1 crore
Annuity factor @ 10% for 3 years   = 2.487
PV of depreciation tax shield   = (1 crore × 0.35) × 2.487 = Rs. 87 lakhs approx.

Calculation of amount placed under finance : [Minimum PV to be recovered from Lessee]
Cost of machine (Rs. in lakhs)   = 300.00
Less: PV of depreciation tax shield   = 87.00
Total   = 213.00

Calculation of Annual Lease Rent :

Let the Lease Rental payable in the last year be L. With rentals payable at the end of each year in a diminishing manner in the ratio of 3:2:1, we have three lease rentals as 3L, 2L &L respectively.

If Rs. 213 lakhs is to be recovered, then effecting the tax we have,

3L (1-T) × PVIF (10%,1) + 2L (1-T) × PVIF (10%,2) + L (1-T) × PVIF(10%,3) =Rs. 213 lakhs

Solving we get L = Rs. 63.86 lacs

Therefore Annual Lease rents are payable in the ratio of Rs. 191.58 lacs, Rs. 127.72 lacs, and Rs. 63.86 lacs in the year 1,2 and 3 respectively.

Bower- Herringer-Wiliamson Method (BHW)

This model aims at segregating cash flow streams into separate parts, one relating financing, and the other relating to tax-shields and salvage value.

Financial Advantage(FA)	Operational Advantage (OA)
PV of loan payments	PV of tax shield on Leasing
Less PV of lease payments	**Less** PV of tax shield on borrowings

Note: If either of the answer is negative, it called disadvantage.

If FA + OA, >0, then go for Leasing

IF FA + OA < 0, then go for borrowing.

Illustration 9

A leasing company's cost of capital is 10%. It proposes to lease a machine costing Rs. 5,00,000 for ten years. Lease payments will be paid in advance. However, there exists a borrowing option too at 16% rate of interest, with installments payable in advance. Depreciation is allowable on straight line basis. Applicable tax rate is 50%. Find the operating advantage of lease using the Bower-Herringer-Williamson Method, if the appropriate discount rate for evalution is 15%.

Solution :

Calculation of Financial Advantage

PV of loan payments   5,00,000

Less: PV of lease rentals = 73,796* × 5.61**   4,15,005

Financial Advantage   84,995

    *   Each equated lease payment = 500000/PVIFA (10%,10) = 73,976

         Advance Lease Payments Hence, PV factors for year 0 to 9 = 6.759

  **   Total of PV factors for 16% for 10 years

Calculation of operational advantage

Equated Loan Installment = 5,00,000/PVIFA (16%,10) = 5,00,000/5.61 = 89,127

Falcon Finance offers a Hire Purchase proposal for an equipment costing Rs. 10 lakhs on the following terms :

   a.   Flat rate of interest of 14%

b. A hire purchase period of 36 months.
c. Post tax cost of debt of the company is 8%
d. Tax rate of the firm is 50%
e. Depreciation rate of equipment is 33.33% as per WDV Method and realizable value of asset at the end of 3 years is NIL

Find the PV of Hire Purchase :

Solution :

Step I   **Find Total Interest burden**

$\qquad$ = Rs. 10,00,000×0.14×3 = Rs. 4,20,000

Step II   **Find Hire Purchase Installment**

$\qquad$ = [Rs. 1000000+420000]÷36 = Rs. 39,444 per months.

$\qquad$ = [Rs. 1000000+420000]÷3 = Rs. 4,73,333 per year.

Step III   **Adopt SOYD method for 36 months for each year as follows :**

$\qquad$ **Find SOYD factors for three years*****

$\qquad$ 1st Year $\quad$: $\quad$ (36+35+34....+25)/(36+35+34...+2+1) = 366/666

$\qquad$ 2nd Year $\quad$: $\quad$ (24+25+23...+13)/(36+35+34...+2+1) = 222/666

$\qquad$ 3rd Year $\quad$: $\quad$ (12+11+10...+1)/(36+35+34+...+2+1) = 78/666

Step IV   **Based on these find interest rate allocations**

$\qquad$ 1st Year $\quad$: $\quad$ Rs. 420000×366/666 = Rs. 2,30,811

$\qquad$ 2nd Year $\quad$: $\quad$ Rs. 420000×222/666 = Rs. 1,40,000

$\qquad$ 3rd Year $\quad$: $\quad$ Rs. 420000×78/666 = Rs. 49,189

Step V   **Prepare the Interest Allocation table**

Year	Hire Purchase Instalment	Interest	Principal Rapayment
1	4,73,333	2,30,811	2,42,522
2	4,73,333	1,40,000	3,33,333
3	4,73,333	49,189	4,24,144

Step VI   **Find Post Tax Interest & Depreciation Tax Shield**

Year	Interest (1-T)	Principal	Depreciation ×	I(1-T)+P-DT
1	230811*0.5	242522	333333*0.5	191261
2	140000*0.5	333333	222222*0.5	292222
3	49189*0.5	424144	148148*0.5	374665

Step VII   **Find the PV at the post tax rate**

$\qquad$ = $191261/(1.08) + 292222/(1.08)^2 + 374665/(1.08)^3$

$\qquad$ = 725047.90

*** Note : Had the tenure been given as 3 years then the SOYD factors would be

$$\frac{3}{1+2+3}, \frac{2}{1+2+3} \ \& \ \frac{1}{1+2+3}$$

Illustration 10

A Ltd. has a total sales of Rs. 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 Rs. 5,00,000. A factor is prepared to buy the firms receivables by charging 2% commissions. 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.

Solution :

Average level of Receivables = 3,20,00,000 × 90/360	80,00,000
Factoing commission = 80,00,000×2/100	1,60,000
Factoring reserve = 80,00,000×10/100	8,00,000
Amount available for advance = Rs. 80,00,000 – (1,60,000 + 8,00,000)	70,40,000

Factor will deduct his interest @ 18%

$$\text{Interest} = \frac{\text{Rs.}\,70,40,000 \times 18 \times 90}{100 \times 360} \qquad = \text{Rs. } 3,16,800$$

∴ Advance to be paid = Rs. 70,40,000 – Rs. 3,16,800   = Rs. 67,23,200

Amount Cost of Factoring to the Firm :	**Rs.**
Cost of credit administration saved	5,00,000
Cost of Bad Debts (Rs. 3,20,00,000×1.5/100) avoided	4,80,000
Total	9,80,000
Net cost of the Firm (Rs. 19,07,200 – Rs. 9,80,000)	9,27,200

$$\text{Effective rate of interest to the firm} = \frac{\text{Rs.}\,927200 \times 100}{6723200} \qquad 13.79\%$$

Note : The number of days in a year have been assumed to be 360 days.

Illustration 11

Under an advance factoring arrangement Bharat Factors Ltd. (BFL) has advanced a sum of Rs. 14 lakhs against the receivable purchased from ABC Ltd. The factoring agreement provide for an advance payment of 80% (maintaining 'factor reserve' of 20% to provide for disputes and deductions relating to the bills assigned) of the value of factored receivables and for guaranteed payment after three months from the date of purchasing the receivables. The advance carries a rate of interest of 20% per annum compounded quarterly and the factoring commission is 1.5% of the value of factored receivables. Both the interest and commissions are collected up-front.

  (i) Compute the amount of advance payable to ABC Ltd.
 (ii) Calculate per annum the effective cost of funds made available to ABC Ltd.
(iii) Calculate the effective cost of funds made available to ABC Ltd. assuming the interest is collected in arrear and commmssion is collected in advance.

Solution :

   (i) **Computation of Advance Payable to ABC Ltd. :**   (Rs. in lakhs)

Value of factored receivable (*i.e.*, 14/0.8)	17.50
Maximun Permissible advance	14.00
Less : Commission @ 1.5 per cent (*i.e.*, 17.50×0.015)	0.26
Less : Discount charge (14×0.2×90/360)	0.70
Funds made available to ABC Ltd.	13.04

   (ii) **Effective Cost :**

Total charge = 0.7+0.26 = Rs. 0.96 lakhs

Total charge expressed as a percentage of funds made available to ABC Ltd.

(*i.e.*, 0.96/13.04) = 7.36% per quarter

The annualized rate of interest = $[1+.0736]^4 - 1 = 32.85$

Hence cost of funds = 32.85%

   (iii) **Effective cost when interest in arrears and commission in advance :**

(Rs. in lakhs)

Maximum permissible avance	14.00
Less : Commission payable up-front (17.50×0.015)	0.26
Funds made available to ABC Ltd.	13.74
Interest charges collected in arrears (*i.e.*, 14×0.20×90/360)	0.70

Total charge expressed as a percentage of funds made available

(0.96/13.74)×100 = 6.99% per quarter

Annualized interest cost = $[(1+.0699)^4-1]×100 = 31.03\%$

Recourse Vs Non-Recourse Factoring

Illustration 12

BP Factors, offers recourse factoring on the following terms :

	Facility	Recourse Factoring
I.	Discount charge (payable up-front)	18% p.a.
II.	Reserve	21%
III.	Commission	2.5%

The Finance Manager of Fame Furnishings Ltd. a dealer in home furnishings has approached BP Factor to factor its receivables. After intricate analysis of the sales documents of Fame Furnishings Ltd. BP Factors offered a guaranteed payment of 45 days.

The following information about the credit policy and trends of Fame Furnishing Ltd is available :

Fame Furnishings sells on terms "2/10 net 45". On a average 50% of the customers pay on the 10th day and avail the discount. Again, on an average the remaining customers pay 80 days after the invoice date. The bad debts and losses amount to 1% of the sales invoices. The

sales personnel are responsible for following up collections and by and large the Fame Furnishings can increase its annual sales by Rs. 25 lakhs if the sales people are relieved from collection jobs. The gross margin on sales is 28% and the estimated sales turnover for the following year without considering the increase in sales is Rs. 300 lakhs. By offloading sales ledger administration and credit monitoring, Fame Furnishings can save overheads to the extent of Rs. 1.50 lakhs per annum. Currently, Fame Furnishings is financing its investments through a mix of bank finance and long-term funds in the ratio of 3:2. The effective rate on bank finance is 17% and the pre-tax cost of long-term funds is 21%.

You are required to :
a. Preform cost-benefit abalysis of rcourse factoring and advice Fame Furnishings whether to accepte the factoring proposal or not.
b. Find out the maximum rate of factoring commission Fame Furnishings can pay if it wishes to relieve the cost of bad debts and be indifferent between recourse and non-recourse factoring.

Solution :
a. The relevant costs associated with in-house manangement of receables and recourse factoring are listed below :

Relevant costs of In-house managemen of receivables

A. Cash discount = 300×0.02×0.50 = Rs. 3.0000 Lakhs

Average collection period = (10×0.50)+(80×0.50) =45 days

Cost of bank finance = (300×3/5) × (45/360) × 0.17 = Rs. 3.8250 lakhs

Cost of long-term funds = (300×2/5) × (45/360) × 0.21 = Rs. 3.1500 lakhs

B. Cost of funds in receivables = Rs. 6.9750 lakhs

C. Bad debt losses = 300×0.01 = Rs. 3 lakhs

D. Contiribution lost on foregone sales = 25×0.28 = Rs. 7.0000 lakhs

E. Avoidated cost of sales ledger administration & credit monitoring = Rs. 1.50000 lakhs

Relevant costs of recourse factoring

F. Factoring commission = 325×0.025 = Rs. 8.1250 lakhs

G. Discount charge = 325×0.79×0.18×(45/360) = Rs. 5.7916 lakhs

Cost-benefit analysis of recourse factoring

H. Benefit associated with recourse factoring = A+B+D+E = Rs. 18.4750 lakhs

I. Cost associated with recourse factoring = F+G+H = Rs. 15.6935 lakhs

J. Net benefit = H–I = Rs. 2.7816 lakhs

As the net benefit associated with recourse factorin, is positive Fame Furnishings is advised to opt for recourse factoring.

b. should be same and as benefit of non-recourse factoring is increased by the amount for bad debt losses i.e. Rs. 3 lakhs, non-recourse factoring commission can be higher than recourse factoring by Rs. 3 lakhs.

∴ Non-recourse factoring commission = 8.125+3 = Rs. 11.125 lakhs.

Maximum factoring commission, BP Factoring can pay = 11.125/325 i.e. Rate 3.42%

2.7 Dividend Policy

This Section includes :

- **Dividend Decision and Valuation of Firm**
  - **Walters Model**
  - **Gordon Model**
  - **MM model**
  - **Residual Model**
  - **Dividend Discount Model**
  - **Lintner Model**
- **Types of Dividends and Dividend Policies**
- **Factors Affecting Dividend Policies**
- **Stability of Dividend**
- **Share Buyback**

INTRODUCTION :

The term dividend refers to that part of profits of a company which is distributed by the company among its shareholders. It is the reward of the shareholders for investments made by them in the shares of the company. The investors are interested in earning the maximum return on their investments and to maximize their wealth. A company, on the other hand, needs to provide funds to finance its long-term growth. If a company pays out as dividend most of what it earns, then for business requirements and further expansion it will have to depend upon outside resources such as issue of debt or new shares. Dividend policy of a firm, thus affects both the long-term financing and the wealth of shareholders. As a result, the firm's decision to pay dividends must be reached in such a manner so as to equitably apportion the distributed profits and retained earnings. Since dividend is a right of shareholders to participate in the profits and surplus of the company for their investment in the share capital of the company, they should receive fair amount of the profits. The company should, therefore, distribute a reasonable amount as dividends (which should include a normal rate of interest plus a return for the risks assumed) to its members and retain the rest for its growth and survival.

DIVIDEND DECISION AND VALUATION OF FIRM :

The value of the firm can be maximized if the shareholders wealth is maximized. There are conflicting views regarding the impact of dividend decision on the valuation of the firm. According to one school of thought dividend decision does not affect the share-holders' wealth and hence the valuation of the firm. On the other hand, according to the other school of thought, dividend decision materially affects the shareholders' wealth and also the valuation of the firm. We have discussed below the views of the two schools of thought under two groups :

a. **The Relevance Concept of Dividend or the Theory of Relevance**

b. **The Irrelevance Concept of Dividend or the Theory of Irrelevance**

The Relevance Concept of Dividends : According to this school of thought, dividends are relevant and the amount of dividend affects the value of the firm. Walter, Gordon and others propounded that dividend decisions are relevant in influencing the value of the firm. Walter argues that the choices of dividend policies almost and always affect the value of the enterprise.

The Irrelevance Concept of Dividend : The other school of thought propounded by Modigliani and Miller in 1961. According to MM approach, the dividend policy of a firm is irrelevant and it does not affect the wealth of the shareholders. They argue that the value of the firm depends on the market price of the share; the dividend decision is of no use in determining the value of the firm.

WALTER'S MODEL :

Walter's model, one of the earlier theoretical models, clearly indicates that the choice of appropriate dividend policy always affects the value of the enterprise. Professor James E. Walter has very scholarly studied the significance of the relationship between the firm's internal rate of return, r, (or actual capitalization rate) and its Cost of Capital, Ke (normal capitalization rate) in determining such dividend policy as will maximize the wealth of the stockholders.

Walter's model is based on the following premises:

(1) The firm finance its entire investments by means of retained earnings. New equity stock or debenture is not issued to raise funds.

(2) Internal rate of return (r) and cost of capital (Ke) of the firm remain constant.

(3) The firm's earnings are either distributed as dividends or reinvested internally.

(4) Earnings and dividends of the firm never change.

(5) The firm has long or infinite life.

The formula used by Walter to determine the market price per share is :

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

Where,

       P = Market price per share

       D = Dividend per share

       E = Earnings per share

       r = Internal rate of return (Actual capitalization rate)

       K = Cost capital (External capitalization rate)

It may be noted that Walter's formula has the same effect as the continuing dividend growth formula. It seeks to measure the effect of dividends on common stock value by comparing actual and normal capitalization rates.

Another feature of Walter's formula is that it provides an added or reduced Weight to the retained earnings portion of the capitalization earnings formula. The factors 'r' and 'k' are placed in front of retained earnings to change its weighted value under different situations as discussed below:

1. Growth Firms

In growth firms internal rate of return is greater than the normal rate($r > k$). Therefore, r/k factor will greater than 1.

Such firms must reinvest retained earnings since existing alternative investments offer a lower return than the firm is able to secure. Each rupee of retained earnings will have a higher weighting in Walter's formula than a comparable rupee of dividends. Thus, large the firm retains, higher the value of the firm. Optimum dividend payout ratio for such a firm will be zero.

2. Normal Firm

Normal firms comprise those firms whose internal rate of return is equal to normal capitalization ($r=k$). These firms earn on their investments rate of return equal to market rate of return. For such firms dividend policy will have no effect on the market value per share in the Walter's model. Accordingly, retained earnings will have the same weighted value as dividends. In this case the market value per share is affected by the payout ratio.

3. Declining Firms

Firms which earn on their investments less than the minimum rate required are designated as declining firms. The management of such firms would like to distribute its earnings to the stockholders so that they may either spend it or invest elsewhere to earn higher return than earned by the declining firms. Under such a situation each rupee of retained earnings will receive lower weight than dividends and market value of the firm will tend to be maximum when it does not retain earnings at all.

4. Evaluation of the Walter's Model

Professor Walter has endeavoured to show in an erudite manner the effects of dividend policy on value of equity shares under different situations of a firm. However, the basic premises on which edifice of the theory is laid down are unrealistic and therefore, conclusions drawn from the Walter's model are hardly true for real life situations.

Thus, for instance assume that a firm finances its investment opportunities only by means of internal sources and no external financing is resorted to for this purpose. Under such a situation, either the value of the firm's investment or dividend or both will be sub-optimum. In its attempt to maximize the value of the firm, the management should go on making investments so long as return of investment is equal to the cost of capital. This is the optimum level of investment, the remaining amount should be raised from external sources. On the contrary, Walter argues that value of the firm is maximized by retaining all the profits because magnitude of investments financed by retained earnings may be less than the optimum level of investment.

Further, Professor Walter has assumed that 'r' remains constant under all the situations. As a matter of fact, 'r' tends to decrease in correspondence with increase in level of investments. This is why it is suggested that the management should make investments upto optimal level where $r = k$.

Finally, assumption of constant cost of capital k is incorrect. On the contrary, it varies in tune with change in risk of the firm.

Illustration 1 : The earnings per share of a company is Rs. 8 and the rate of capitalisation applicable is 10%. The company has before it an option of adopting (i) 50%, (ii) 75%and(iii)100% dividend payout ratio. Compute the market price of the company's quoted shares as per Walter's model if it can earn a return of (i) 15%, (ii) 10% and (iii) 5% on its retained earnings.

Computation of market price of Company's share by applying Walter's formula

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

Where P = Market price per share

D = Dividend per share

R_a = Internal rate of return on investment

R_c = Cost of capital *i.e.,*10%or 0.10

E = Earnings per share *i.e.,* Rs. 8

Now, we can calculate the market price per share based on different IRRs and dividend payout rations.

(i) **Market price per share when R_a = 15%**

(a) **When dividend payout ratio is 50%**

Dividend paid = 8 × 50/100 = Rs. **4**

$$P = \frac{4 + \frac{0.15}{0.10}(8 - 4)}{0.10} = \text{Rs. } 100$$

(b) **When dividend payout ratio is 75%**

Dividend paid = Rs. 8×75/100 = Rs. 6

$$P = \frac{6 + \frac{0.15}{0.10}(8 - 6)}{0.10} = \text{Rs. } 90$$

(c) **When dividend payout ratio is 100%**

i.e., dividend paid = Rs. 8

$$P = \frac{8 + \frac{0.15}{0.10}(8 - 8)}{0.10} = \text{Rs. } 80$$

(ii) Market price per share when R_a = 10%

    (a) When dividend payout ratio is 50% i.e., Rs. 4

$$P = \frac{4 + \dfrac{0.10}{0.10}(8-4)}{0.10} = \text{Rs. } 80$$

    (b) When dividend payout ratio is **75% i.e., Rs. 6**

$$P = \frac{6 + \dfrac{0.10}{0.10}(8-6)}{0.10} = \text{Rs. } 80$$

    (c) When dividend payout ratio is 100% **i.e., Rs. 8**

$$P = \frac{8 + \dfrac{0.10}{0.10}(8-8)}{0.10} = \text{Rs. } 80$$

(iii) Market price per share when R_a = 5%

    (a) When dividend payout ratio is **50% i.e., Rs. 4**

$$P = \frac{4 + \dfrac{0.05}{0.10}(8-4)}{0.10} = \text{Rs. } 60$$

    (b) When dividend payout ratio is **75% i.e., Rs. 6**

$$P = \frac{6 + \dfrac{0.05}{0.10}(8-6)}{0.10} = \text{Rs. } 70$$

    (c) When dividend payout ratio is **100% i.e., Rs. 8**

$$P = \frac{8 + \dfrac{0.05}{0.10}(8-8)}{0.10} = \text{Rs. } 80$$

GORDON'S MODEL :

Myron Gordon has also developed a model on the lines of Prof. Walter suggesting that dividends are relevant and the dividend decision of the firm affects its value. His basic valuation model is based on the following assumptions:

1. The firm is an all equity firm.
2. No external financing is available or used. Retained earnings represent the only source of financing investment programmes.
3. The rate of return on the firm's investment r, is constant.

4. The retention ratio, b, once decided upon is constant. Thus, the growth rate of the firm g = br, is also constant.
5. The cost of capital for the firm remains constant and it is greater than the growth rate, i.e. k > br.
6. The firm has prepetual life.
7. Corporate taxes do not exist.

According to Gordon, the market value of a share is equal to the present value of future stream of dividends. Thus,

$$P = \frac{D1}{(1+K)} + \frac{D2}{(1+K)2} + \frac{Dt}{(1+K)t}$$

$$= \sum_{t=1}^{n} \frac{Dt}{(1+K)^t}$$

Gordon's basic valuation formula can be simplified as under :

$$P = \frac{E(1-b)}{Ke - br}$$

or, $P = \dfrac{D}{Ke - g}$

Where,

P	=	Price of shares
E	=	Earnings per share
b	=	Retention Ratio
ke	=	Cost of equity capital
br = g =		growth rate in r, i.e., rate of return on investment of an all-equity firm
D	=	Dividend per share

The implications of Gordon's basic valuation model may be summarized as below :

1. When the rate of return of firm's investment is greater than the required rate of return, i.e. when r > k, the price per share increases as the dividend payout ratio decreases. Thus, growth firm should distribute smaller dividends and should retain maximum earnings.
2. When the rate of return is equal to the required rate of return, i.e, when r = k, the price per share remains unchanged and is not affected by dividend policy. Thus, for a normal firm there is no optimum dividend payout.

3. When the rate of return is less than the required rate of return, i.e., when r<k, the price per share increases as the dividend payout ratio increases. Thus, the shareholders of declining firm stand to gain if the firm distributes its earnings. For such firms, the optimum pay out would be 100%.

MODIGLIANI-MILLER'S MODEL (M-M'S MODEL) :

Modigliani-Miller's (M-M's) thoughts for irrelevance of dividends are most comprehensive and logical. According to them, dividend policy does not affect the value of a firm and is therefore, of no consequence. It is the earning potentiality and investment policy of the firm rather than its pattern of distribution of earnings that affects value of the firm.

Basic Assumptions of M-M Approach

(1) There exists perfect capital market where all investors are rational. Information is available to all at no cost; there are no transaction costs and floatation costs. There is no such investor as could alone influence market value of shares.

(2) There does not exist taxes. Alternatively, there is no tax differential between income on dividend and capital gains.

(3) Firm has uncertainty as to future investments and profits of the firm. Thus, investors are able to predict future prices and dividend with certainty. This assumption is dropped by M-M later.

M-M's irrelevance approach is based on arbitrage argument. Arbitrage is the process of entering into such transactions simultaneously as exactly balance or completely offset each other. The two transactions in the present case are payment of dividends and garnering funds to exploit investment opportunities. Suppose, for example, a firm decides to invest in a project it has alternatives :

(1) Pay out dividends and raise an equal amount of funds from the market;

(2) Retain its entire earnings to finance the investment programme. The arbitrage process is involved where a firm decides to pay dividends and raise funds from outside.

When a firm pays its earnings as dividends, it will have to approach market for procuring funds to meet a given investment programme. Acquisition of additional capital will dilute the firms share capital which will result in drop in share values. Thus, what the stockholders gain in cash dividends they lose in decreased share values. The market price before and after payment of dividend would be identical and hence the stockholders would be indifferent between dividend and retention of earnings. This suggests that dividend decision is irrelevant.

M-M's argument of irrelevance of dividend remains unchanged whether external funds are obtained by means of share capital or borrowings. This is for the fact that investors are indifferent between debt and equity with respect to leverage and cost of debt is the same as the real cost of equity.

Finally, even under conditions of uncertainty, divided decision will be of no relevance because of operation of arbitrage. Market value of share of the two firms would be the same if they

identical with respect to business risk, prospective future earnings and investment policies. This is because of rational behavior of investor who would prefer more wealth to less wealth. Difference in respect of current and future dividend policies cannot influence share values of the two firms.

M-M approach contains the following mathematical formulations to prove irrelevance of dividend decision.

The market value of a share in the beginning of the year is equal to the present value of dividends paid at the year end plus the market price of the share at the end of the year, this can be expressed as below :

$$P_o = \frac{D_1 + P_1}{(1+K)} \quad ----- \rightarrow \quad Equation\ (1)$$

Where,

P_0	=	Existing price of a share
K	=	Cost of capital
D_1	=	Dividend to be received at the year end
P_1	=	Market value of a share at the year end

If there is no additional financing from external sources, value of the firm (V) will be number of share (n) multiplied by the price of each share (Po). Symbolically :

$$V = nP_o = \frac{n(D_1 + P_1)}{(1+K)} \quad ------ \rightarrow \quad Equation\ (2)$$

If the firm issues m number of share to raise funds at the end of year 1 so as to finance investment and at price P_1, value of the firm at time o will be :

$$nP_o = \frac{nD_1 + (n-m)P_1 - mP_1}{1+K} \quad ------ \rightarrow \quad Equation\ (3)$$

Thus, the total value of the firm as per equation (3) is equal to the capitalized value of the dividends to be received during the period, plus the value of the number of share outstanding at the end of the period, less the value of the newly issued shares.

A firm can finance its investment programme either by ploughing back of its earnings or by issue of new share or by both. Thus, total amount of new share that the firm will issue to finance its investment will be :

$$mP_1 \quad = \quad I_1 - (X_1 - nD_1)$$

$$= \quad I_1 - X_1 + nD_1 \quad -------\rightarrow \quad Equation\ (4)$$

Where,

mP_1 = Total amount of funds raised by issue of new share to finance investment projects.

I_1 = Total amount of investment during first period

X_1 = Total amount of net profit during first period

If equation (4) substituted into equation (3), we find the following equation :

$$nP_o = \frac{(n+m)P_1 - L_1 + X_1}{1+K} \quad ------\to \quad Equation\ (5)$$

On comparison of equation (5) with equation (3) we find that there is no difference between the two valuation equations although equation (5) has expressed the value of firm without dividends. This led M-M to conclude that dividend policy has no role to play in influencing share value of a firm.

Criticism of MM Approach

MM hypothesis has been criticised on account of various unrealistic assumptions as given below.

1. Perfect capital market does not exist in reality.
2. Information about the company is not available to all the persons.
3. The firms have to incur flotation costs while issuing securities.
4. Taxes do exit and there is normally different tax treatment for dividends and capital gain.
5. The firms do not follow a rigid investment policy.
6. The investors have to pay brokerage, fees etc., while doing any transaction.
7. Shareholders may prefer current income as compared to further gains.

Illustration. Agile Ltd. belongs to a risk class of which the appropriate capitalisation rate is 10%. It currently has 1,00,000 shares selling at Rs. 100 each. The firm is contemplating declaration of a dividend of Rs.6 per share at the end of the current fiscal year which has just begun. Answer the following questions based on Modigliani and Miller Model and assumption of no taxes:

(i) What will be the price of the shares at the end of the year if a diviend is not declared?

(ii) What will be the price if dividend is declared?

(iii) Assuming that the firm pays dividend, has net income of Rs. 10 lakh and new investments of Rs. 20 lakhs during the period, how many new shares must be issued?

Solution :

Modigliani and Miller - Dividend Irrelevancy Model

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

Where,

D_1 = Contemplated dividend per share *i.e.,* Rs. 6

P_1 = Market price of share at the year end (to be determined)

P_o = Existing market price of share *i.e.,* Rs. 100

K_e = Cost of equity capital or rate of capitalisation *i.e.,* 10% or 0.10

(i) If dividend is not declared :

$$P_0 = \left[\frac{P_1 + D_1}{1 + K_e}\right]$$

$$100 = \left[\frac{P_1 + 0}{1 + 0.10}\right]$$

$$100 = \left[\frac{P_1}{1.10}\right]$$

$100 \times 1.10 = P_1$

P_1 = Rs. 110

(ii) If dividend is declared :

$$P_0 = \left[\frac{P_1 + D_1}{1 + K_e}\right]$$

$$100 = \left[\frac{P_1 + 6}{1 + 0.10}\right]$$

$$100 = \left[\frac{P_1 + 6}{1.10}\right]$$

$100 \times 1.10 = P_1 + 6$

$110 = P_1 + 6$

$P_1 = 110 - 6$

P_1 = Rs. 104

(ii) Calculation of No. of Shares to be issued

Particulars		Dividend declared	Dividend not declared
Net Income		10,00,000	10,00,000
Less : Dividends paid		6,00,000	
Retained earnings		4,00,000	10,00,000
New investments		20,00,000	20,00,000
Amount to be raised by issue of new shares	(A)	16,00,000	10,00,000
Market pice per share	(B)	Rs. 104	Rs. 110
New shares to be issued (A)/(B)	(C)	15,385	9,091

Alternatively, the number of new shares to be issued is calculated as follows :

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

Where,

n = Number of Shares outstanding at the beginning of the period *i.e.,* 1,00,000 shares

ΔN = Change in the number of Shares outstanding during the period (to be ascertained)

I = Total investment required for capital budget *i.e.,* Rs. 20,00,000

E = Earning of the firm during the period after payment of dividend.

If dividend declared = 10,00,000 - 6,00,000 = Rs. 4,00,000

If no dividend declared = 10,00,000

Now we can calculate the number of new shares to be issued :

(I) If dividend declared :

$$\Delta N = \frac{20,00,000 - 4,00,000}{Rs.104} = 15385 \text{ Shares}$$

(II) If no dividend declared :

$$\Delta N = \frac{20,00,000 - 10,00,000}{110} = 9091 \text{ Shares}$$

Verification of M.M. Dividend Irrelevancy Theory

Particulars		Dividend declared	Dividend not declared
Existing shares		1,00,000	1,00,000
New shares issued		15,385	9,091
Total No. of shares at the end	(i)	1,15,385	1,09,091
Market price per share	(ii)	Rs. 104	Rs. 110
Total market value of shares at the year end	(i)×(ii)	Rs. 120 lacs	Rs. 120 lacs

Therefore, whether dividends are paid or not, value of the firm remains the same as per M.M. approach.

RESIDUAL MODEL :

If a firm wishes to avoid issue of shares, then it will have to rely on internally generated funds to finance new positive NPV projects. Dividends can only be paid out of what is left over. This leftover is called a residual and such a dividend policy is called residual dividend approach.

When we treat dividend policy as strictly a **financing decision**, the payment of cash dividends is a passive residual. The amount of dividend payout will fluctuate from period to period in keeping with fluctuations in the number of acceptable investment opportunities available to the firm. If these opportunities abound, the percentage of dividend payout is likely to be zero. On the other hand if the firm is unable to find pofitable investment opportunities, dividend payout will be 100%.

With a residual dividend policy, the firm's objective is to meet its investment needs and mostly to maintain its desired debt equity ratio before paying dividends. To illustrate imagine that a firm has Rs. 1000 in earnings and a debt equity ratio of 0.5. Thus the firm has 0.5 of debt for every 1.5 of the total value. The firms capital structure is 1/3 of debt and 2/3 of equity.

The first stpe in implementing a residual dividend policy is to deermine the amount of funds that can be generated without selling new equity. If the firm reinvests the entire Rs. 1000 and pays no dividend, then equity will increase by Rs. 1000. To keep the debt equity ratio constant, the firm must borrow Rs. 500.

The second stpe is to decide whether or not the dividend will be paid. If funds needed are less than the funds generated then a dividend will be paid. The amount of dividend will be the residual after meeting investment needs. Suppose we require Rs. 900 for a project. Then 1/3 will be contributed by debt (i.e. Rs. 300) and the balance by equity/retained earnings. Thus the firm would borrow Rs. 300 and fund Rs. 600 from the retained earnings. The residual i.e. Rs. 1000 – Rs. 600 = Rs. 400 would be distributed as dividend.

More clarity can be had from the data givne below :

PAT	New Invst.	Debt portion	Retained Earnings	Additional Equity	Dividends
1000	3000	1000	1000	1000	0
1000	2000	667	1000	333	0
1000	1500	500	1000	0	0
1000	1000	333	667	0	333
1000	500	167	333	0	667
1000	0	0	0	0	1000

DIVIDEND DISCOUNT MODEL :

The dividend disocunt model is a more conservative variation of discounted cash flows, that says a share of stock is worth the present value of its future *dividends,* rather than its earnings. This model was popularized by John Burr Williams in *The Theory of Investment Value*.

... a stock is worth the present value of all the dividends ever to be paid upon it, no more, no less... Present earnings, outlook, financial condition, and capitalization should bear upon the price of a stock only as they assist buyers and sellers in estimating future dividends.

The dividend discount model can be applied effectively only when a company is already distributing a significant amount of earnings as dividends. But in theory it applies to all cases, since even retained earnings should eventually turn into dividends. That's because once a company reaches its "mature" stage it won't need to reinvest in its growth, so management can begin distributing cash to the shareholders. As Williams puts it.

If earnings not paid out in dividends are all successfully reinvested... then these earnings should produce dividends later; if not, then they are money lost... In short, a stock is worth only *what you can get out of it*.

The Dividend Discount Model (DDM) is a widely accepted stock valuation tool found in most introdutory finance and invesment textbooks. The model calculates the present value of the future dividends that a company is expected to apply to its shareholders. It is particularly useful because it allows investors to determine an absolute or "intrinsic" value of a particular comapny that is not influenced by current stock market conditions. The DDM is also useful because the measurement of future dividends (as opposed to earnings for example) facilitates an "apples-to-apples" comparison of companies across different industries by focusing on the actual cash investors can expect to receive.

There are three alternative dividend discount models used to determine the intrinsic value of a share of stock

  a. the constant (or no-growth) dividend model;

  b. the constant growth dividend model; and

  c. the two-stage (or two-phase) dividend growth model.

Constant dividends :

$P = D_1 / K_e$	where :	• P = intrinsic value
		• D_1 = expected dividend
		• k_e = appropriate discont factor for the investment

This method is useful for analyzing preferred shares where the dividend is fixed. However, the constant dividend model is limited in that it does not allow for future growth in the dividend payments for growth industries. As a result the constant growth dividend model may be more useful in examining a firm.

Constant dividend growth :

$P = D_1 / (k_e - g)$	where :	• P = intrinsic value
		• D_1 = expected dividend
		• k_e = appropriate discont factor for the investment
		• g = constant dividend growth rate

The constant dividend growth model is useful for mature industries, where the dividend growth is likely to be steady. Most mature blue chip stocks may be analyzed quickly with the constant dividend growth model. This model has its limitations when considering a firm which is in its growth phase and will move into a mature phase at some time the future. A two stage growth dividend model may be utilized in such situations. This model allows for adjustment to the assumptions of timing and magnitude of the growth of the firm.

For initial dividend growth & then steady growth :

$$P = \sum_{t=1}^{n} \left[\frac{D_0 (1 + g_1)^t}{(1 + K_e)^t} \right] + \frac{D_0 (1 + g_2)}{k_e - g_2} \left[\frac{1}{(1 + k_e)^t} \right]$$

where : P = instrinsic value = PV of dividends + PV of price

D_0 = expected dividend

ke = appropriate discount factor for the investment

$g1$ = initial dividend growth rate

$g2$ = steady dividend growth rate

LINTNER MODEL :

John Lintner surveyed dividend behavior of several corporate and showed that

    a. Firms set long run target payout ratios.

    b. Managers are concerned more about change in the dividend than the absolute level

    c. Dividends tend to follow earnings, but dividends follow a smoother path than earnings

    d. Dividends are sticky in nature because managers have a reluctance to effect dividend changes that may have to be reversed.

Lintner expressed corporate dividend behavior in the form of a following model :

$$D_t = cr\ EPS_t + (1-c)D_{t-1}$$

D_t = DPS for year t

c = Adjustment rate or Speed or Adjustment

r = Target Payout Rate

EPS_t = EPS for year t

D_{t-1} = DPS for year t–1

The Lintner model shows that the current dividend depends partly on curent earnings and partly on previous years dividend. Likewise the dividend for the previous year depends on the earnings of that year and the dividend for the year preceding that year, so on and so forth. Thus as per the Lintner Model, dividends can be described in terms of a weighted average of past earnings.

Dividend Dates

What is a Declaration, Record, Ex-Dividend & Payment dates?

Decleration date : The date on which board of directors declare dividend is called a declaration date.

Record date : Record date, is that date when the company closes its stock transfer books and makes up a list of the shareholders for payment of dividends.

Ex-dividend date : It is that date notified by the stock exchange, as a date which will entail a buyer of shares, **the dividend,** if bought before the ex-dividend date. This date sets up the convention of declaring that the right to the dividend remains with the stock until 'x' days prior to the Record date. Thus whoever buys share on or beyond the ex-dividend date are not entitled to dividend.

Payment date : The date on which the company mails the cheques to the recorded holders.

Example :

Let us say, settlement of stocks follows "T+3", which means that, when you buy a stock, it takes three days from the transaction date (T) for the change to be entered into the comany's record books. As mentioned, if you are not in the company's record books on the date of record, you won't receive the dividend payment. To ensure that you are in the record books, you need to buy stock at least three days before the date of record, **which also happens to be the day before the ex-dividend date**.

	Ex-Dividend Date		Date of Record	
Monday	Tuesday	Wednedsday	Thursday	Friday
5th	6th	7th	8th	9th

As you can see by the diagram above, if you buy on the ex-dividend date, which is only two days before the date of record, you will not receive the dividend because your name will not appear in the company's record books until Friday. If you want to buy the stock and receive the dividend, you need to buy it on the Monday the 5th. (When the stock is trading with the dividend the term "cum dividend" is used). If you want to sell the stock and still receive the dividend, you need to sell on or after Tuesday the 6th.

TYPES OF DIVIDEND POLICY :

The various types of dividend policies are discussed as follows:

1. Regular Dividend Policy

Payment of dividend at the usual rate is termed as regular dividend. The investors such as retired persons, widows and other economically weaker persons prefer to get regular dividends. A regular dividend policy offers the following advantages.

a. It establishes a profitable record of the company.

b. It creates confidence amongst the shareholders.

c. It aids in long-term financing and renders financing easier.

d. It stabilizes the market value of shares.

e. The ordinary shareholders view dividends as a source of funds to meet their day-to-day living expenses.

f. If profits are not distributed regularly and are retained, the shareholders may have to pay a higher rate of tax in the year when accumulated profits are distributed.

However, it must be remembered that regular dividends can be maintained only by companies of long standing and stable earnings. A company should establish the regular dividend at a lower rate as compared to the average earnings of the company.

2. Stable Dividend Policy

The term 'stability of dividends' means consistency or lack of variability in the stream of dividend payments. In more precise terms, it means payment of certain minimum amount of dividend regularly. A stable dividend policy may be established in any of the following three forms.

(a) Constant dividend per share : Some companies follow a policy of paying fixed dividend per share irrespective of the level of earnings year after year. Such firms, usually, create a 'Reserve for Dividend Equalisation' to enable them to pay the fixed dividend even in the year when the earnings are not sufficient or when there are losses. A policy of constant dividend per share is most suitable to concerns whose earnings are expected to remain stable over a number of years. Figure given below shows the behavior of dividend in such policy.
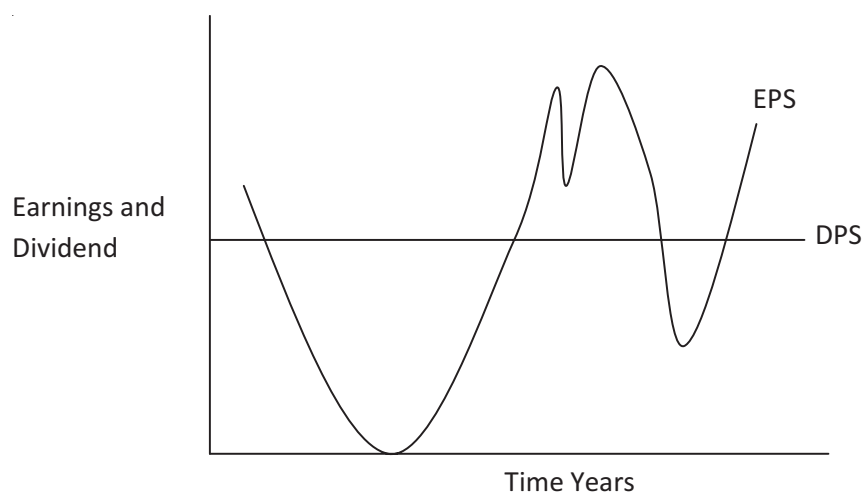
(b) Constant pay out ratio: Constant pay-out ratio means payment of a fixed percentage of net earnings as dividends every year. The amount of dividend in such a policy fluctuates in direct proportion to the earnings of the company. The policy of constant pay-out is preferred by the firms because it is related to their ability to pay dividends. Figure given below shows the behavior of dividends when such a policy is followed.
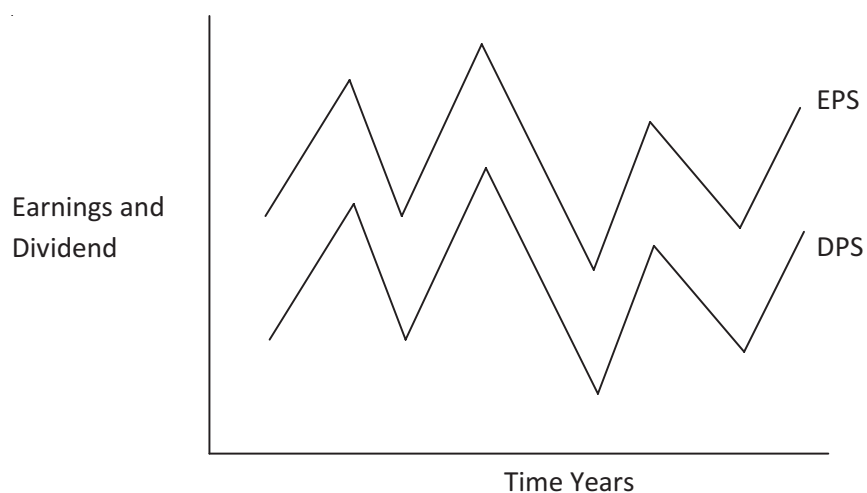
(c) Stable rupee dividend plus extra dividend: Some companies follow a policy of paying constant low dividend per share plus an extra dividend in the years of high profits. Such a policy is most suitable to the firm having fluctuating earnings from year to year.

Advantages of Stable Dividend Policy

A stable dividend policy is advantageous to both the investors and the company on account of the following;

a) It is sign of continued normal operations of the company.

b) It stabilizes the market value of shares.

c) It creates confidence among the investors.

d) It provides a source of livelihood to those investors who view dividends as a source of funds to meet day-to-day expenses.

e) It meets the requirements of institutional investors who prefer companies with stable dividends.

f) It improves the credit standing and makes financing easier.

g) It results in a continuous flow to the national income stream and thus helps in the stabilization of national economy.

Dangers of Stable Dividend Policy

Inspite of many advantages, the stable dividend policy suffers from certain limitations. Once a stable dividend policy is followed by a company, it is not easier to change it. If the stable dividends are not paid to the shareholders on any account including insufficient profits, the financial standing of the company in the minds of the investors is damaged and they may like to dispose off their holdings. It adversely affects the market price of shares of the company. And if the company pays stable dividends in spite of its incapacity, it will be suicidal in the long-run.

3.   Irregular Dividend Policy

Some companies follow irregular dividend payments on account of the following:

a. Uncertainty of earnings.

b. Unsuccessful business operations.

c. Lack of liquid resources.

d. Fear of adverse effects of regular dividends on the financial standing of the company.

4.   No Dividend Policy

A company may follow a policy of paying no dividends presently because of its unfavourable working capital position or on account of requirements of funds for future expansion and growth.

5.   Residual Dividend Policy

When new equity is raised floatation costs are involved. This makes new equity costlier than retained earnings. Under the Residual approach, dividends are paid out of profits after making provision for money required to meet upcoming capital expenditure commitments.

TYPES OF DIVIDENDS :

Dividends may be declared in the form of cash, stock, scrips, bonds and property. We shall discuss each of these forms.

1. Cash Dividends

Cash dividend is, by far, the most important form of dividend. In cash dividends stock holders receive cheques for the amounts due to them. Cash generated by business earnings is used to pay cash dividends. Sometimes the firm may issue additional stock to use proceeds so derived to pay cash dividends or approach bank for the purpose. Generally, stockholders have strong preference for cash dividends.

2. Stock Dividends

Stock dividends rank next to cash dividends in respect of their popularity. In this form of dividends, the firm issues additional shares of its own stock to the stockholders in proportion to the number of shares held in lieu of cash dividends. The payment of stock dividends neither affects cash and earnings position of the firm nor is ownership of stockholders changed. Indeed there will be transfer of the amount of dividend from surplus account to the capital stock account which tantamount to capitalization of retained earnings. The net effect of this would be an increase in number of shares of the current stockholders. But there will be no change in their equity. With payment of stock dividends the stockholders have simply more shares of stock to represent the same interest as it was before issuing stock dividends. Thus, there will be merely an adjustment in the firm's capital structure in terms of both book value and market price of the common stock.

3. Stock Splits

Closely related to a stock dividend is a stock split. From a purely economic point of view a stock split is nothing but a gaint stock dividend. A stock split is a change in the number of outstanding shares of stock achieved through a proportional reduction of increase in the par value of the stock. The management employs this device to make a major adjustment in the market price of the firm's stock and consequently in its earnings and dividends per share. In stock split only the par value and number of outstanding shares are affected. The amounts in the common stock, premium and retained earnings remain unchanged. This is exhibited in the table. It may be noted from the table that although number of shares was doubled, capital account of the firm did not change because of proportional reduction in par value of the stock.

EFFECT OF A 2-FOR-1 STOCK SPLIT ON A FIRM'S EQUITY

	Before the Stock Split	After the Stock Split
Common Stock (Re. 1 par, 4,00,000 shares)	4,00,000	
0.50 par, 8,00,000 shares		4,00,000
Premium	3,00,000	3,00,000
Retained earnings	40,00,000	40,00,000
	47,00,000	47,00,000

Except in accounting treatment, the stock dividend and stock split are very similar. Stock split is recorded as a doubling of the number of the shares outstanding and having of the par value per share. For a stock dividend, however, the account increases by the par value of

shares issued, increases the capital-surplus account by the difference between the market value of the shares issued and the par value, and reduces the retained earnings account by an amount needed to leave networth unchanged. For both stock splits and stock dividends, therefore, networth is unaffected. The difference in accounting procedure may be illustrated.

A company has the following networth :
Capital Stock:

Common Shares, Rs. 10 par, 2,00,000	20,00,000
Retained earnings	45,00,000
	65,00,000

After a 2-for-1 split, this would appear as follows :
Capital Stock:

Common Shares, Rs. 5 par, 4,00,000	20,00,000
Retained earnings	45,00,000
	65,00,000

After a 100 per cent stock dividend the networth would show as follows (using par value as a basis for the transfer) :

Capital Stock :

Common Shares, Rs. 10 par, 4,00,000	40,00,000
Retained earnings	25,00,000
	65,00,000

Owing to differences in accounting procedure the balance sheet will differ in each case, the net effect is the same.

A.   Reasons for stock splits
A number of reasons may be offered for splitting of the firm's common stock. These are:

i)   Broader Marketability of the stock
The basic reason of stock split is to provide broader and more stable market for the stock. It is agreed that when stock prices of a company tend to rise sharply due to economic prosperity of the company and its improved profitability and it is believed that the price of the sock has moved out of the price range of any investors narrowing the market of stock, the management may, in a bid to promote wider distribution of shares, resort to stock split. Stock split will result in lowering price of stock and the stocks will be within easy reach of common investors.

ii)   Need for Garnering External Resources
A company contemplating to garner funds from the market may use stock split to prepare ground for new issues. In times of rising stock prices, market price of shares of profitable and prosperous companies rises beyond the reach of a large number of investors. In view of limited saleability of shares, companies may experience a great problem in acquiring desired amount of capital. Thus, to increase the marketability of new issues, stock split is very often used.

iii) Merger or Acquisition of Companies

A firm contemplating merger or acquisition through exchange of stock will often split its stock to make the transactions more attractive to stockholders of the firm it is taking over. Suppose, for example, Globe Company offers to acquire assets of Alfred Company through an exchange of stock. The management of Globe Company decides that an exchange ratio of 1 to 10 (1 share of Globe Company for 10 shares of Alfred Company) would be fair to stockholders of both companies. However, 1:10 exchange ratio may not appeal to stockholders of Alfred company and the offer may be rejected. In such a situation stock split may be employed to make the offer attractive. Thus, the management of Globe Company by splitting 1 share in 5 shares, may put the exchange ratio at 1:2 which may be readily accepted by stockholders of Alfred Company.

B. Reverse Split

Sometimes, a company may think of reducing the number of shares so as to enhance its share price. This can be accomplished by means of reverse split which means reduction in number of outstanding shares. To illustrate, assume a company has 4,00,000 outstanding shares of Re. 1 share. If the management declares 1-for-2 reverse split, the company will have 2,00,000 shares of Rs. 2 per share. Under this arrangement stockholders receive fewer shares with higher par value.

The basic purpose of reverse split is to increase the market value of each share. Companies experiencing financial trouble usually find their share prices declining in the market. Such companies follows the policy of reverse split so as to check further price decline and raise it. The announcement of a reverse split is an indication that the company is in financial jeopardy. Reverse stock splits are not as common as stock split ups.

Stock splits must be approved by a majority in number, representing three-fourths in value of members of the firm and approved by a Court of Law. The firm is required to give notice of this alternation to the Registrar of Joint Stock Companies within 30 days of doing so (Section 391, Indian Companies Act, 1956).

4. Scrip Dividend

Scrip dividend means payment of dividend in scrip of promissory notes. Sometimes company needs cash generated by business earnings to meet business requirements because of temporary shortage of cash. In such cases the company may issue scrip or notes promising to pay dividend at a future date. The scrip usually bears a definite date of maturity or sometimes maturity date is not stipulated and its payment is left to the discretion of the Board of Directors.

Scrips may be interest-bearing or non-interest bearing. Such dividends are relatively scarce. The issue of scrip dividends is justified in the following circumstances:

1. When a company has plentitude of earnings to distribute dividends but cash position is temporarily meager because bulk of the sale proceeds which are tied in receivable

for time being will be released very shortly, the management in such a situation may issue certificates to the stockholders promising them to pay dividend in the near future.

2. When a company wants to maintain an established dividend record without paying out cash immediately, it may take recourse to scrip dividend.

3. When the management believes that stock dividends will not be useful because further earnings of the company will not increase sufficiently to maintain dividend rate on increased shareholding, issue of promissory notes to pay dividends in future would be a wise step.

4. When the company does not wish to borrow to cover its dividend requirements the danger lies in their use as a sop to stockholders when business earnings are inadequate to make dividend payments.

Such a form of dividend is non-existent in India.

5. Bond Dividend

As in scrip dividends, dividends are not paid immediately in bond dividends. Instead the company promises to pay dividends at a future date and to that effect bonds are issued to stock holders in place of cash. The purpose of both the bond and scrip dividends is alike, i.e., postponement of dividend payments. Difference between the two is in respect of the date of payment and their effect is the same. Both result in lessening of surplus and addition to the liability of the firm. The only difference between bond and scrip dividends is that the former carries longer maturity than the latter. Thus, while issue of bond dividend increases long-term obligation of the company, current liability of the company would rise as a consequence of the issuance of the scrip-dividends. In bond dividends stockholders have stronger claim against the company as compared to dividends.

Bond used to pay dividends carry interest. This means that the company assumes fixed obligation of interest payments annually and principal amount of bond at maturity date. It should be remembered that the company is assuming this obligation in return for nothing except credit for declaring dividends. How far the company will be able to satisfy this obligation in future, is also difficult to predict at the time of issue of bonds. The management should, therefore, balance cost of issuing bond dividends against benefits resulting from them before deciding about distribution of dividends in the form of bonds. Bond dividends are not popular in India.

6. Property Dividends

In property dividend the company pays dividends in the form of assets other than cash. Generally, assets which are superfluous for the company are distributed as dividends to the stockholders. Sometimes the company may use its products to pay dividends. Securities of the subsidiary companies owned by the company may also take the form of property dividends. This kind of dividend payment is not in vogue in India.

FACTORS AFFECTING DIVIDEND POLICY :

There is a controversy amongst financial analysts regarding impact of dividends on market price of a company's shares. Some argue that dividends do not have any impact on such

price while others hold a different opinion. However, preponderance of evidence suggests that dividend policies do have a significant effect on the value of the firm's equity shares in the stock exchange. Having accepted this premise, it will now be appropriate to consider those factors which affect the dividend policy of a firm.

The factors affecting the dividend policy are both external as well as internal.

External factors

Following are the external factors which affect the dividend policy of a firm:

1.   **General state of economy -** The general state of economy affects to a great extent the management's decision to retain or distribute earnings of the firm. In case of uncertain economic and business conditions, the management may like to retain the whole or a part of the firm's earnings to build up reserves to absorb shocks in the future. Similarly in periods of depression, the management may also withhold-dividends payment to retain a large part of its earnings to preserve the firm's liquidity position. In periods of prosperity the management may not be liberal in dividend payments though the earning power of a company warrants it because of availability of larger profitable investment opportunities.

Similarly in periods of inflation, the management may withhold dividend payments in order to retain larger proportion of the earnings for replacement of worn-out assets.

2.   **Legal restrictions -** A firm may also be legally restricted from declaring and paying dividends. For example, in India, the companies Act, 1956 has put several restrictions regarding payments and declaration of dividends. Some of these restrictions are as follows :

(i)   Dividends can only be paid out of (a) the current profits of the company, (b) the past accumulated profits or (c) money provided by the Central or State Governments for the payment of dividends in pursuance of the guarantee given by the Government. Payment of dividend out of capital is illegal.

(ii)   A company is not entitled to pay dividends unless (a) it has provided for present as well as all arrears of depreciation, (b) a certain percentage of net profits of that year as prescribed by the Central Government not exceeding 10%, has been transferred to the reserves of the company.

(iii)   Past accumulated profits can be used for declaration of dividends only as per the rules framed by the Central Government in this behalf.

Similarly, the Indian Income Tax Act also lays down certain restrictions on payment of dividends. The management has to take into consideration all the legal restrictions before taking the dividend decision otherwise it may be declared as ultra vires.

Internal factors

The following are the internal factors which affect the dividend policy of a firm:

1.   **Desire of the shareholders -** Of course, the directors have considerable liberty regarding the disposal of the firm's earnings, but the shareholders are technically the owners of the company and, therefore, their desire cannot be overlooked by the directors while deciding about the dividend policy.

     Shareholders of a firm expect two forms of return from their investment in a firm:

     (i)   **Capital gains -** The shareholders expect an increase in the market value of the equity shares held by them over a period of time. Capital gain refers to the profit resulting from the sale of capital investment i.e., the equity shares in case of shareholders. For example, if a shareholder purchases a share for Rs. 40 and later on sells it for Rs.60 the amount of capital gain is a sum of Rs. 20.

     (ii) **Dividends -** The shareholders also expect a regular return on their investment from the firm. In most cases the shareholders' desire to get dividends takes priority over the desire to earn capital gains because of the following reasons:
             (a) Reduction of uncertainty - Capital gains or a future distribution of earnings involves more uncertainty than a distribution of current earnings.
             (b) Indication of strength - The declaration and payment of cash dividend carries an information content that the firm is reasonably strong and healthy.
             (c) Need for current income - Many shareholders require income from the investment to pay for their current living expenses. Such shareholders are generally reluctant to sell their shares to earn capital gain.

2.   **Financial needs of the company -** The financial needs of the company are to be considered by the management while taking the dividend decision. Of course, the financial needs of the company may be in direct conflict with the desire of the shareholders to receive large dividends. However, a prudent management should give more weightage to the financial needs of the company rather than the desire of the shareholders. In order to maximize the shareholders' wealth, it is advisable to retain earnings in the business only when company has better profitable investment opportunities as compared to the shareholders. However, the directors must retain some earnings, whether or not profitable investment opportunity exists, to maintain the company as a sound and solvent enterprise.

3.   **Desire of control -** Dividend policy is also influenced by the desire of shareholders or the management to retain control over the company. The issue of additional equity shares for procuring funds dilutes control to the detriment of the existing equity shareholders who have a dominating voice in the company. At the same time, recourse to long-term loans may entail financial risks and may prove disastrous to the interests of the shareholders in times of financial difficulties.

     In case of a strong desire for control, the management may be reluctant to pay substantial dividends and prefer a smaller dividend pay out ratio. This is particularly true in case of companies which need funds for financing profitable investment

opportunities and an outside group is seeking to gain control over the company. However, where the management is strongly in control of the company either because of substantial shareholdings or because of the shares being widely held, the firm can afford to have a high dividend pay out ratio.

4.   Liquidity position - The payment of dividends results in cash outflow from the firm. A firm may have adequate earnings but it may not have sufficient cash to pay dividends. It is, therefore, important for the management to take into account the cash position and the overall liquidity position of the firm before and after payment of dividends while taking the dividend decision. A firm may not, therefore, be in a position to pay dividends in cash or at a higher rate because of insufficient cash resources. Such a problem is generally faced by growing firms which need constant funds for financing their expansion activities.

STABILITY OF DIVIDEND :

Another important dimention of a dividend policy is the stability of dividends i.e. how stable, regular or steady should the dividend stream be, over time? It is generally said that the shareholders favour stable dividends and those dividends, which have prospects of steady upward growth. If a firm develops such a pattern of paying stable and steady dividends, then the investors/shareholders may be willing to pay a higher price for the shares. So while designing a dividend policy for the firm, it is also to be considered as to whether the firm will have a consistency in dividend payments or the dividends will fluctuate from one year to another. In the long run, every firm will like to have a consistent dividend policy, yet fluctuations from one year to another may be unfavourable.

Rationale for stability of dividend

Most of the firms follow stable dividends or gradually increasing dividends due to following reasons —

a.   Many investors consider dividends as a part of regular income to meet their expenses. Hence, they prefer a predictable pattern of dividends rather than fluctuating pattern. A fall in the dividend inocme may lead to sale of some shares. On the other hand when the dividend income increases, an investor may invest some of the proceeds as reinvestment in shares. Both the cases involve transaction cost and inconvenience for investor. Hence, they prefer regular dividends.

b.   The dividend policy of firms conveys a lot to the investors. Increasing dividends means better prospects of the company. On the contrary, decreasing dividends suggest bad earnings expectations. In addition, stable dividends are sings of stable earnings of the company. On the other hand, varying dividends lead to uncertainty in the mind of shareholders.

c.   Certain investors mainly institutional, consider the stability of dividends as an important criterion before they decide on the investment in that particular firm.

SHARE BUYBACK (REPURCHASE) :

When companies have sufficient liquid assets they resort to share buy back or share repurchase, wherein they cancel or retire a part of its outstanding shares by purchasing from the market or directly from the shareholders. This is particularly relevant when the shares are available

in the market much below its book value. When the shares are repurchased, the underlying motive is to distribute the excess cash to the shareholders. The cancellation of shares means the shareholders will receive cash for their shares, reduced outstanding number of shares in the books of the coampany, earnings per share increase and also market price of the share increases.

There are **three** methods of shares repurchase :

a. **Repurchase Tender Offer :** Here the firm specifies the number of shares it proposes to buy back, the price it would pay and the time period for which the offer would be open for the shareholders to tender their shares. The firm may retain the flexibility to withdraw the offer if insufficient number of shares are submitted for repurchase.

b. **Open Market Repurchase :** Here the firm buys from the market at the prevailing price. The time period is generally longer than that is adopted for Tender Offers. In terms of flexibility, the open maket repurchase provides the firm more fredom in deciding when to repurchase and how many shares to be repurchased.

c. **Negotiated Repurchase :** In this case the firm may buy shares from a large shareholder at a negotiated pice. This is adopted only when a large shareholder groups viz. promoters, are willing to sell their stake.

Let S denote the number of outstanding shares. Po be the current market price and N be the number of shares that would be bought back by the company then

Theoretical post Buy Back price (P_1) is given as $= \dfrac{S \times P_0}{S - N}$. As it can be seen the price after buy back would increase, as the number of shares outstanding gets reduced.

Advantages of Shares Repurchase over Dividends

1. Cash dividend implies a commitment on the part of a company to continue payments in future, as investors keep expecting them. However, share repurchase is an one time affair.

2. The decision to repurchase the shares offers a company more flexibility as to number of shares, the period etc.

3. Share repurchase are more focused in terms of paying out cash only to those shareholders who need it. However, dividends are paid to all.

4. Share buy back provide a way of increasing insiders control in the firm. If only outsiders tender their shares, automatically insiders control increases.

When Share buyback is adopted by the companies?

a. If excess cash flows are temoporary, share repurchase can be adopted. If cash flows are stable, then the firm may prefer to give dividends.

b. Firms uncertain about their future investment opportunities in the business are more likely to use share repurchase as a means of returning cash to shareholders.

c. The share repurchase is relevant especially when the shares of the firm are undervalued.

d. When the promoters want to increase their control in the firm they use share buyback to the maximum effect.

Clientele Effect

Investors have diverse preferences. Some want more dividend income; others want more capital gains; still others want a balanced mix of dividend income and capital gains. Over a period of time, investors naturally migrate to firms which have a dividend policy that matches their preferences. The concentration of investors in comapanies with dividend policies that are matched to their preferences is called the **clientele effect**. The existence of a clientele effect implies that (a) firms get investors they deserve and (b) it will be difficult for a firm to change and established dividend policy.

PROBLEMS AND SOLUTIONS :

Illustration 1

A company has following capital :

7% Preference Shares of Rs. 100 each	6,00,000
Ordinary Shares of Rs. 10 each	16,00,000
	22,00,000

The following information are available relating to its financial year ending 31-12-2008:

i) Profit, after taxation @ 40%, Rs. 5,42,000
ii) Ordinary dividend paid 20%.
iii) Depreciation Rs. 1,20,000
iv) Market price of Ordinary Shares Rs. 40
v) Capital Commitment Rs. 2,40,000.

You are required to calculate the following :

a) The dividend yield on the Ordinary Shares.
b) The cover for the preference and Ordinary dividends.
c) The earnings yield,
d) The price-Earning ratio,
e) The Net Cash Flow,
f) The reason for the comparison of net cash flow with capital commitment.

Solution :

a) Dividend yield on ordinary shares (or) dividend yield ratio

$$= (DPS / \text{ market price}) \times 100$$

$$= (10 \times 20\% / 40) \times 100$$

$$= 5\%$$

[Market price = Capitalized value of dividend]

b) Dividend coverage ratio:

⇨ preference = (PAT / Preference dividend)

= 542000 / 42000

= 12.9 times

=> Equity = (PAT – Preference dividend) / equity dividend

= 500000 / 320000

= 1.5625 times

c) Earnings yield ratio = (EPS / market price) x 100

= (3.125 / 40) x 100

= 7.8125 %

[EPS = 500000 / 160000 = Rs 3.125]

d) Price Earning Ratio = [(40 / 3.125)] = 12.8 times

(Market price / EPS)

e) Net cash flow   Rs

PAT	542000
(+) depreciation	120000
	662000
(-) preference dividend	42000
(-) equity dividend	320000
Net cash flow	300000

f) Since the cash flow position shows the firms ability to meet the capital expenditure / capital commitment.

Illustration 2

ABC Ltd. has a capital of Rs.10 lakhs in equity shares of Rs.100 each. The shares currently quoted at par. The company proposes declaration of a dividend of Rs.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) A dividend is not declared?

ii) A dividend is declared?

iii) Assuming that the company pays the dividend and has net profits of Rs.5,00,000 and makes new investments of Rs.10 lakhs during the period, how many new shares must be issued? Use the M.M. model.

Solution :

Modigliani – Miller Approach

n = no of shares = 10000

P_0 = market price = Rs100

D_1 = Expected dividend = Rs10

K_e = cost of capital = 12%

i. Market price of share (P_1) if dividend not declared

Given $D_1 = 0$

We know,

$$P_0 = (D_1+P_1)/ (1+K_e)$$

⇨ $P_1 = 112$

ii. P_1 if dividend declared

$D_1 = Rs10$

$P_0 = (D_1+P_1) / (1+ K_e)$

$P_1 = Rs.102$

iii. No of shares to be issued :

Δn = $(I – E + n D_1)/ P_1$

  = $(1000000 – 500000 + 100000) / 102$

  = 5882 shares

Illustration 3

A textile company belongs to a risk-class for which the appropriate PE ratio is 10. It currently has 50,000 outstanding shares selling at Rs.100 each. The firm is contemplating the declaration of Rs.8 dividend at the end of the current fiscal year which has just started. Given the assumption of MM, answer the following questions.

i)   What will be the price of the share at the end of the year: (a) if a dividend is not declared, (b) if it is declared?

ii)   Assuming that the firm pays the dividend and has a net income of Rs.5,00,000 and makes new investments of Rs.10,00,000 during the period, how many new shares must be issued?

iii) What would be the current value of the firm: (a) if a dividend is declared, (b) if a dividend is not declared?

Solution :

Given,

$$P/E \text{ ratio} = 10$$

$$n = 50{,}000 \text{ shares}$$

$$P_0 = \text{Rs. } 100$$

$$D_1 = \text{Rs. } 8$$

$$E = \text{Rs. } 5{,}00{,}000$$

$$I = \text{Rs. } 10{,}00{,}000$$

$$Ke = 1 / (P/E \text{ ratio})$$

1. Calculation of P_1

1.   if dividend not declared:

$$P_0 = (D_1 + P_1) / (1 + Ke)$$

$$P_1 = \text{Rs} 110$$

2.   if dividend declared:

$$P_0 = (D_1 + P_1) / (1 + Ke)$$

$$P_1 = \text{Rs.} 102$$

3.   If the company pay dividend:

$$P_1 = \text{Rs} 102$$

$$\Delta n = (I - E + nD_1) / P_1$$

No of new shares, Δn = 900000 / 102 = 8823.5294 shares

4.   Value of the firm:

a) If the company pay dividend:

$$V = (n + \Delta n) \, P_1 \; = \; (58823.5294) \; 102$$

$$= \text{Rs} 6000000$$

b)   If the company does not pay dividend:

$$V = (n + \Delta n) \, P_1 \; = \; 54545.4545 \times 110$$

$$= \text{Rs} 6000000$$

Working notes:

Δn = (1000000 - 500000) / 110 = 4545.4545

Illustration 4

(i) From the following information supplied to you, ascertain whether the firm's D/P ratio is optimal according to Walter. The firm was started a year ago with an equity capital of Rs. 20 lakh.

Earnings of the firm	Rs 2,00,000.00
Dividend paid	1,50,000.00
P/E ratio	12.50

Number of shares outstanding, 20,000 @ Rs.100 each. The firm is expected to maintain its current rate of earnings on investment.

ii) What should be the P/E ratio at which the dividend payout ratio 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?

Solution :

i. Ke = (EPS / market price) = 1 /(12.5) = 8 %

r = (200000 / 2000000) x 100 = 10 %

Payout ratio = (150000/200000) x 100 = 75%

It is the growth firm (r > Ke), as per WALTER's model the optimum payout ratio is Zero.

So in the given case pay out ratio is not optimum.

Proof:

a). Market price at 75% payout ratio

EPS = Rs10

DPS = Rs7.5

r = 10 % & Ke = 8%

$$\text{Market Price} = \frac{DPS + \dfrac{r}{Ke}(EPS - DPS)}{Ke}$$

$$\text{Market Price} = \frac{7.5 + \dfrac{0.1}{0.08}(2.5)}{0.08} = Rs.\,132.81$$

b).   Market price at zero payout:

EPS = Rs10

DPS = Rs0

r = 10 % & Ke = 8 %

$$\text{Market Price} = \frac{DPS + \dfrac{r}{Ke}(EPS - DPS)}{Ke} = 156.25$$

Therefore Zero Payout is optimum.

i. The payment of dividend in case of normal firms(r = Ke) has no effect on the market value of the share.

Ke = r = 10%

P/E ratio = 10times i.e [1 / Ke]

ii. If P/E ratio = 8 , Ke= 12.5 %

r = 10%

When r < Ke the firm is Decline firm as per WALTER and its Optimum payout ratio is 100%.

So in the given case it is 75% payout only, it is not optimum payout.

Proof :

Market price at 75% payout:

$$\text{Market Price} = \frac{DPS + \dfrac{r}{Ke}(EPS - DPS)}{Ke} = Rs.\ 36.00$$

At 100% payout.

$$\text{Market Price} = \frac{DPS + \dfrac{r}{Ke}(EPS - DPS)}{Ke} = Rs.\ 80.00$$

Illustration 5

Excellence Ltd registered earnings of Rs. 800,000 for the year ended 31st March. They finance all investments out of retained earnings. The opportunities for investments are many. If such opportunities are not availed their earnings will stay perpetually at Rs. 800,000. Following figures are relevant.

Policy	Retention (%)	Growth (%)	Cost of equity on all investments.
A	0	0	14
B	25	5	15
C	40	7	16

The returns to shareholders are expected to rise if the earnings are retained because of the risk attached to new investments. As for the current year, dividend payments will be made with or without retained earnings. What according to you, should be retained ?

Solution :

GORDAN Model : Market Price $= \dfrac{D_0(1+g)}{K_e - g}$

Evaluation of different dividend policies :

	Policy A	Policy B	Policy C
Retention ratio	0 %	25 %	40%
Payout ratio	100%	75%	60%
g	0%	5 %	7 %
Dividend (D_0)	800000	600000	480000
D_1	800000	630000	513600
K_e	14 %	15%	16%
Value of firm $[(D_1)/ (K_e\text{-}g)]$	5714286	6300000	5706667
(Add) dividend	800000	630000	513600
Cum dividend Value of firm	6514286	6930000	6220267

From the above policies, policy B gives more value to the share holders. Hence it is advisable to adopt the policy B.

Illustration 6

X Ltd. has 1000 shares of Rs 10 each raised at a premium of Rs. 15 per share. The company's retained earnings are Rs. 552500. The Company's stock sells for Rs. 20 per share.

a. If a 10% stock dividend is declared how many new shares would be issued?

b. What would be the market price after the stock dividend?

c. How would the equity account change?

d. If a 25% stock dividend is declared what changes will take place?

e. If the company instead declares a 5:1 stock split, how many shares will be outstanding? What would be the new par value? What would be the new market price?

f. If the company declares a 1:4 reverse split, how many shares will be outstanding? What would be the new par value? What would be the new market price?

g. If the company declares a dividend of Rs. 2 per share and the stock goes ex dividend tomorrow, what will be the price at which it will sell?

Solution :

a) **If 10% stock dividend declared:**

No of new shares issued as bonus = 100

b) Market price after bonus issue = [(1000 x 20) + (100 x 0)] / 1100

= Rs.18.18

c) **Change in equity account**

Equity share capital increased by Rs1000

Reserves decreased by Rs1000.

Hence, there is no change in the Net Equity

d) **If 25% stock dividend declared**

1) No. of new shares issued = 1000 @ 25 % = 250 shares

2) Market price after stock dividend = [(1000 x 20) + (250 x 0)] / 1250

= Rs.16

3) Change in EQUITY account:

Capital increased by Rs. 2500

Reserve decreased Rs.2500

There is no change in Net Equity.

e) **If the company declares 5 : 1 stock split i.e. 5 shares issued in exchange of 1 share each.**

No of shares outstanding = 5000

New face value of share = 10/ 5 = Rs.2

New market price = 20 / 5 = Rs.4

f) **If the company declares 1: 4 reverse split i.e 1 share issued in exchange of every 4 shares.**

No of shares outstanding = 250

New face value = 4 x 10 = Rs.40

Market price = 20 x 4 = Rs.80

g) Cum dividend market price = Rs. 20

(-) dividend = 2

Ex-dividend market price Rs. 18

Illustration 7

Following is the capital structure of Progressive Co. Ltd. as on 31st March, 2009.

	Rs.
Equity Share Capital (1,00,000 shares of Rs. 10 each)	10,00,000
Share premium	15,00,000
Reserves & Surpluses	5,00,000
Net worth	30,00,000

On 1st April, 2007, the company made a bonus issue of two shares for every five held. The market price at the time of bonus issue was Rs. 40 per share. X holds 100 shares of the Progressive Co. Ltd. purchased on 1st April, 2003 a market price of Rs. 30. He sold these shares on 31st March, 2009 at Rs. 50 per share. The income – tax rate for X is 20% and capital gain tax is 15% for him. If the company pays a regular dividend of 10% on par before transferring earnings to reserves and surpluses, state whether X was able to earn his required rate of return of 10% on his investment? (The PV at 10% 1st year 0.91; 2nd year 0.83; 3rd year 0.75; 4th year 0.68; 5th year 0.62 and 6th year 0.56).

Solution :

Appraisal of Investment decision : [NPV method]

1) **Initial Investment (out flow) :**

   100 shares @ 30 each = 3000

2) **Present value recurring cash inflows**

Year	Dividend	Tax	Net cash inflow	PV factor @ 10%	Present value
1	100	20	80	0.91	72.80
2	100	20	80	0.83	66.40
3	100	20	80	0.75	60.00
4	140	28	112	0.68	76.16
5	140	28	112	0.62	69.44
6	140	28	112	0.56	62.72
					407.52

3) **Present value of terminal cash inflow :**

   Sale proceeds   140shares @ 50 each = 7000

   (-) capital gain tax   4000@ 15% = 600
                                                  ───────
                                                   6400

   Its present value = 6400 x 0.56 = 3584

4) **NET PRESENT VALUE :**

   Present value of cash inflow (407.52+3584)   = 3,991.52

   (-) outflow   3000
                                                    ───────
   Net present value   991.52

The investment yields more than 10 % return to the investor.

2.8 Financial Management In Public Sector

This section includes :

- **Evolution of Public Sector in India**
- **Distinction between Public Sector and Private Sector Accounting**
- **Special Financial Feature**
- **Formulation, Evaluation and Implementation of Projects**
- **Genesis of Disinvestment in India**

INTRODUCTION :

Before independence, there was almost no "Public sector" in Indian economy. The only instances worthy of mention were Railways, The Post & Telegraph, The Port Trust, The Ordnance and the Aircraft factories and few Government controlled undertakings.

After independence India adopted the road of planned economic development through Five year plans. In this plans India opted for dominance of the Public Sector firmly believing that Political independence without economic self-reliance would not enable for Government to fulfill the aspirations of the countrymen. The passage of Industrial Policy Resolution of 1956 and adoption of socialist pattern of society as the national economic goal of the country built the foundation of the dominant public sector as we see it today. It was believed that a dominant public sector would reduce the inequality of income and wealth and advance the general prosperity of the nation.

EVOLUTION OF PUBLIC SECTOR IN INDIA :

The main objectives of setting up the Public Sector enterprises as stated in Industrial policy Resolution of 1956 were :

- To help in the rapid economic growth and Industrialisation of the country and create necessary infrastructure for economic development.
- To earn return on investment and utilise resources for development.
- To promote redistribution of income and wealth.
- To create employment opportunities.
- To promote balanced regional development.
- To promote import substitutions, save and earn foreign exchanges for the economy.

The 2nd Five year Plan document clearly stated that "All industries of basic and strategic importance or in the nature of public utility services should be in the public sector. Other industries, which are essential and require investment on a scale, which only the state, in the present circumstances, could provide have also to be in the public sector". It further

emphasized that, "The public sector has to expand rapidly. It has not only to initiate developments which the private sector is either unwilling or unable to undertake, it has to play the dominant role in shaping the entire pattern of investment in the economy". The investment in public sector enterprises has grown from Rs. 29 Crore in 5 PSU on 01.04.1951 to Rs. 2,52,554 Crore in 240 PSU on 31.03.2000.

Objectives

The objectives of public sector enterprises may be divided into three categories :

1. Economic objectives

i.   *Economic development* - Public enterprises are established to accelerate the rate or economic growth, by setting up key and basic industries like iron and steel, petroleum, power generation, chemicals, machine building, *etc.* The public sector provides an essential base for faster economic growth of the country. Expansion of capital goods industries lead to the development of other industries.

ii. *Planned growth* - The private sector neglects the industries with long gestation periods and low rate of returns. Public enterprises step in to fill up gaps in the industrial structure by setting up industries which are economically unattractive, but nationally essential. Public sector provides infrastructure facilities for diversified and balanced growth.

iii. *Balanced regional development* - Public sector concerns are designed to facilitate the growth of backward regions so as to reduce regional disparities in industrial growth.

iv. *Generation of surplus* - Public enterprises are expected to generate and distribute surplus for financing five-year plans and other schemes of public welfare.

v.   *Provide employment* - One of the important objectives of public enterprises is to reduce the unemployment by creating employment opportunities.

2. Social objectives

i.   *Control monopoly* - Sometimes, public enterprises seek to check private monopoly and restrictive practices and the resulting evils like exploitation.

ii. *Equitable distribution of wealth* - Public enterprises are expected to reduce disparities in the distribution of income and wealth. Reduction of economic disparities is one of the objectives of our constitution and public enterprises are helpful in checking concentration of economic power.

iii. *Provision of essential goods and services* - An important objective of public undertakings is to provide essential goods and services for consumption at reasonable prices. This helps in improving the standard of living of the people. Social control over industry ensures equitable distribution of commodities and helps to protect the consumer from exploitation by greedy businessmen.

iv. *Takeover of sick units* - Closure of sick units may result in loss of employment to a large number of people and wastage of national resources. Public enterprises like the National

Textile Corporation was set up to nationalise such units and to make them healthy and profitable. Public enterprises also facilitate the groups of small-scale industries.

3. Political objectives

i.   *Public interest* - Public enterprises are established in the interest of the country as a whole. India has become an industrial power because of the development of public sector concerns. They facilitate self-reliance in strategic sectors.

ii.   *National defence* - Public enterprises are set up for the manufacture of arms, ammunition, telecommunications, oil, *etc.*, which are essential for the safety and security of the country.

iii. *Socialism* - Public enterprises are required to future the political ideology of the Government as well as to serve the constitutional objectives of socialistic pattern of society.

DISTINCTION BETWEEN PUBLIC SECTOR AND PRIVATE SECTOR ACCOUNTING :

Public sector accounts are prepared to show the accountability to the concerned department and private sector accounts are prepared to find out operating results, profit or loss, out of the commercial transactions undertaken to earn profit. Other differences are as follows:

- *Different Accounting System* - Private sector accounts are prepared on accrual basis *i.e.* earning and spending *etc.* Balance of both debit and credit side equates one another, but public sector accounts are maintained on cash basis *i.e.* cash receipt and cash payment for the respective period are taken into consideration.

- *Profit or Loss* - The purpose of public sector account is to depict accountability to the legislature while private sector accounts try to depict commercial profit earned for the year ended.

- *Balance Sheet* - In private sector accounts, balance sheet shows assets and liabilities on a cumulative basis but in case of public sector accounting, the current year's expenditures as well as capital receipts are shown. In Private sector accounting final accounts consists of profit and loss account, balance sheet, statement of changes in financial position. In case of public sector accounts, final accounts consists of public sector account and balancing accounts. Under balancing account, all the balances of the public sector accounts are shown along with receivables and payables.

- *Equation* - In private sector accounting equation of assets and liabilities takes the following form: Capital, Surplus, Other liabilities; Fixed assets, Current assets, Investments. But in case of public sector accounting equation takes the following form: Public sector account receivables-Payables.

- *System of Entry* - Under private sector accounting, double entry system is followed and journal, ledger, trial balance can be prepared. But in the case of public sector accounting, single entry system is followed because of its inability to prepare trial balance for absence of full information.

- *Depreciation* - In private sector accounts, depreciation is charged on income statement to arrive at true profit or loss, so that after the termination of the life of the asset they buy a new asset for replacing the old asset; and also to claim tax exemption from commercial profit. But in case of public sector accounting, there is no provision for providing

depreciation. It lost its relevance in providing depreciation in absence of proper value of asset; but in certain cases like Transportation Company which charges depreciation for maintaining its assets.

- *Form of Accounts* - In public sector accounting, the form of accounts takes the following form: (i) Consolidated Fund; (ii) Public Fund and (iii) Contingency Fund. In case of Private sector accounting, concerns registered under the Companies Act shall follow the form prescribed under the Companies Act, 1956.

SPECIAL FINANCIAL FEATURE :

Public Sector: Capital Expenditure in Projects

A project requires a large amount of investment which is done by creating a variety of financing arrangements. Often a corporate legal entity is formed to run the project (such as SAIL, GAIL, IOL, *etc.)*. Suppliers of capital then look at the earnings stream of the project for repayment of their loan or for the return on their equity investment. Often, the project involves energy: not only the large extrapolations of gas, oil, and coal but also tankers, port facilities, refineries, and pipelines. Other project includes mineral extraction operations, aluminum plants fertilizer plants, and very importantly power plants. An example of the latter is a cogeneration project.

Projects of this sort require huge amounts of capital, often beyond the reach of a single company. Many times a consortium of companies is formed to spread risk and to finance the project. Part of the capital comes from equity participation by the companies, and rest comes from lenders or lessors.

If the loan or lease is on a non-recourse basis, the lender or lessors pays exclusive attention to the size of the equity participation and to economic feasibility of the project. In other words, lender can look only to the project for payout, so the larger the equity cushion and the confidence that can be placed on the projections, the better the project. In another type of arrangement, each sponsors may guarantee its shares of the projects obligations. Under these circumstances, the lender places emphasis on the credit worthiness of the sponsors as well as on the economic feasibility of the project.

So it is very important to find the benefits and costs of a project for the sponsors. This financial appraisal of a project can be viewed as a two step procedure:

- Determination of cash flows (both inflows and outflows) associated with the project.
- Appraise the cash flow stream to determine whether the project is financially viable or not.

But before this discussion it is important to introduce the assumptions behind it. The assumptions are :

- The cash flows occur only once a year,
- The risk characterizing is similar to the risk complexion of ongoing projects of the firm.

Cash Flow Determination

Forecasting is a planning tool. It is used for projecting future operational results of all activities of business-marketing, personnel, finance *etc.* All this activities has a chain link effect. A successful business has to anticipate the demand of the product by making a sales forecast. As the second step, production forecasts are made by estimating the requirement of material, men, machinery. And finally the requirements for finance are assessed to execute all the activities which lead us to make cash forecasting because in a business anything done or to be done financially affects the cash eventually. However, there is no major difference between business forecasting covering other functional activities and cash forecasting. All other forecasts are on accrual basis whereas cash forecasts are on cash basis. In brief, the following are the benefits of cash forecasting:

1. It helps to find cash requirements of a business and setting different policies towards that.

2. It reveals the quantum and period when the business is likely to face cash deficits so that appropriate action is taken for arranging additional funds before the actual deficit manifests itself.

3. It also points out the periods of cash surpluses too, so that the same can be utilized by proper investment in the short term securities. It also helps in pulling the cash and transfer of funds to other projects, so as to optimize the use of cash resources of the business.

4. Long-term cash forecasting provide necessary input with regard to the working capital and fixed capital requirement for the implementation of the plan.

5. It may not insulate any business from bankruptcy.

Primarily there are two methods for making cash forecasts :

1. *Receipt & disbursement method* - Under this method the individual items which involve movement of cash during the forecast period are estimated. Since such a forecast is for a shorter period, normally up to one year, estimates are made for all items for receipts and payments having some significant value. Such forecasts are fairly accurate.

2. *Net adjusted income method* - This method involves culling out of information pertinent to movement of cash from the already prepared accounting statements like forecasted profit and loss account and balance sheet to make future projections of cash requirements. Then, true to its name the method makes necessary adjustment in the accounting figures appearing in such forecasted Profit and Loss Account and Balance Sheet which have prepared on accrual based figures to cash based figures. The statements so prepared are known as Forecasted Cash Flow Statement.

Time Horizons

The variables are forecasted for a predetermined period of time. This in business parlance is known as "Time horizon". It refers to the time span for which the forecasting is making. There cannot be rigid rules to determine length of a time horizon. Conventionally accounts

of a business are prepared for a period of twelve months; forecasts are also made for twelve months so as to have an equitable ground for comparison of the forecasts with the accounting results. We have seen that cash forecasts act as a hub of all other forecasts like sales forecasts, purchase forecasts, production forecasts *etc.* It, therefore, is prepared for identical period of twelve months too, to synchronize with the period of other forecasts. Depending on the time horizon, cash forecast is divided into two different categories:

- *Short term cash forecasts* – it is for a shorter period. Minimum period may be as near as next day but the maximum period is not stretched beyond twelve months.

- *Long term cash forecasts* – long term cash forecasts are not much concerned with display of detail of cash receipts and payments. The forecasts concentrate on issues like cash resource requirements for fixed assets, change in working capital funds *etc.* thereby educating management on financial consequences of the strategic plans which a business intends to pursue.

Cost-Benefit Analysis

The important principles underlying measurement of costs and benefits are as follows:

1. It is measured in terms of cash flows. This implies that all non cash charges (expenses) like depreciation which are considered for the purpose of determining the profit after tax must be added back to arrive at net cash flows for our purpose.

2. Since the net cash flows relevant from the firm's point of view are what accrue to the firm after paying tax, cash flows for the purpose of appraisal must be defined in post tax terms. And from the suppliers point of view net cash flows are defined as long term funds.

3. Interest on long term loans are not considered for estimating the net cash flows since it is defined from the supplier's point of view.

4. The cash flows must be measured in incremental terms.

Some implications of this principle are as follows:

- If the proposed project has a beneficial or detrimental impact on say, the other product lines of the firm, then such impact must quantified and must be considered for ascertaining the net cash flows.

- Sunk cost must be ignored.

- Opportunity cost must be considered which is associated with the utilization of the resources available with the firm.

- The share of existing overhead costs which is to be borne by the end products of the proposed projects must be ignored.

Pricing Policy in Public Sector

The pricing policy of public enterprises in India differ form that of private enterprises in that it has a macro objective with micro implications. Since public sector enterprises are bound by the promise of fulfilling certain socialistic objectives and providing impetus to industrial

development, their pricing policy is required to conform to that rationale which takes into account its impact on inter-enterprises and inter-industries, besides the impact on the enterprise itself and its final consumers.

The different pricing followed by public enterprises can be broadly grouped under three major heads :

1. Promotion-oriented pricing;

2. Surplus generation-oriented pricing;

3. Stabilization-oriented pricing.

Where external benefits arising from the operations of public enterprises outweigh surpluses at the enterprise level, relatively lower prices, implying an indirect subsidy to the beneficiaries, may be adopted. Public utilities, financial intermediaries, *etc.* are examples of promotion-oriented pricing in India. Public enterprises may follow a pricing policy to raise surpluses either to plough back for their own development or contributing to the development and overall progress of the economy. The typical example of surplus generation-oriented pricing is provided by the operations of the State Trading Corporation where the pricing of certain imported items is meant for scrapping off fortuitous profits by taking advantage of the prevailing domestic shortage.

The stabilization or regulation-oriented pricing in the public enterprise is intended to produce a countervailing effect on private enterprise in certain market conditions in respect of goods which are of primary necessity. As a result of such pricing policy, private enterprises are forced to sell their products at lower prices. This type of operations in public enterprises can be successful only if the public sector is in a position to release adequate supplies at lower prices so that the restrictive and monopolistic trade practices by the private enterprises can be brought under control. Besides, public enterprises may offer their products like intermediate inputs for the benefit of private enterprises on the understanding that the end products be sold at fair prices to final consumers. These kinds of operations have been confined largely to mass consumption goods in India.

Pricing Principles

The pricing principles followed in public enterprises have been varied and diverse in nature. The following, however may be distinguished.

(a) *Cost plus pricing* - The objective of cost plus pricing is to recover fully the cost and return on investment. The cost plus pricing is employed in public enterprises like Indian Telephone Industries, Hindustan Aeronautics, *etc.* wherein the government is a major buyer.

(b) *Marginal costing* - In industries where cost decreases with increase in the scale of production, marginal cost pricing entails a price subsidy to the extent of the difference between average cost and marginal cost. This principle is justified provided the goods and services in question have consumption and / or production externalities (external benefits) and high price elasticity of demand which inhibits full utilization of productive

capacity. In public enterprises like BHEL, HEC and Electricity Boards where under utilization has been perennially an inhibiting factor, the application of marginal cost pricing principle has enabled them to recover a portion of the total cost. In multi-product enterprises, the subsidy on account of the marginal cost being lower than average cost in some products is offset by average cost being lower than marginal cost in some other products.

(c) *Discriminatory pricing* - Discriminatory pricing is commonly used in some of the multi-product and multi-service enterprises. The typical examples are provided by public enterprises such as Railways, Indian Airlines and State Trading Corporation. It is well known that in Indian Railways and Airlines, the passenger traffic is subsidized by the goods traffic.

(d) *Import-based pricing* - Import-based is normally followed in those public enterprises which have no domestic competition and whose production costs are higher than the price of similar imported products. Under such conditions, in order to safeguard the interests of domestic consumers, the import-based price constitutes the basis for price fixation.

(e) *Externally determined pricing* - In some areas, the prices of public enterprises are externally determined. Prices of some essential commodities are controlled by the government and it is likely that some public enterprises are involved in the manufacture of these commodities. Typical examples of such price fixation are the prices of steel and fertilizers. In certain cases, government fixes the prices between the two public enterprises. Such inter-enterprise price fixation does not involve the application of basic principle determination and is normally tentative and informal.

Price policies pursued by state enterprises therefore need to be directed by the governments towards the fulfillment of certain primary economic aims, such as the following :

1. Improvement in the distribution of income by laying greater emphasis on wages rather than mere profits;

2. Self reliance in initiation of new projects and the operations, expansion and financing of existing projects;

3. Securing of improved inter-industrial distribution of resources;

4. Stimulation of market demand or restriction on consumption;

5. Providing stimulus to the growth of private industries;

6. Reduction of economic irregularities among consumers;

7. Implementation of the concept of full employment;

8. Maximizing utilization of existing stock of capital;

9. Provision for the strongest possible incentives to efficiency and

10. Accumulation of the projected rate.

Keeping in view the above objectives, while fixing prices and profits of public sector products and emphasizing state undertaking should not only pave their way but make legitimate profits, a variety of consideration need to be done in mind. Some of them are indicated below :

- The general market price;
- The question as to what part of the economy in cost should be passed on to the consumer and what portion to the tax payer;
- The likelihood of non-availability and, therefore, scarcity in the near future;
- The principle of what the traffic can bear.

Guidelines to Pricing

It is very necessary to have suitable guidelines for public enterprises which operate under monopolistic or semi monopolistic conditions in order to derive externalities and direct benefits to the consumers under the guidance of socialistic objectives. Pricing policies to be adopted may follow the following guidelines:

1. The pricing of products should be within the landed costs of comparable imported goods which would be the normal ceiling (and not on the basis of C.I.F prices).

2. Within the ceiling of landed cost, it would be open to the enterprises to have price negotiation and fixed prices at suitable levels for their products which would give them a reasonable return on the capital invested. It is also desired that the price so fixed should be operative for a period of two to three years.

3. Ordinarily, the landed cost should be regarded as the absolute ceiling. If, however, in accessing the landed costs, there are reasons to believe that imported F.O.B. / C.I.F prices are artificially low, or in other exceptional circumstances, where our own cost of production is very high, it may be necessary to have the prices higher than the landed costs. In such circumstances, the matter is required to be referred to the administrative ministry concerned for examination in depth in consultation with the M.O.F and Bureau of Public Enterprises, *etc.*

FORMULATION, EVALUATION AND IMPLEMENTATION OF PROJECTS :

While evaluating a capital expenditure we assume that the risk or quality of all investment proposals under consideration does not differ from the risk of existing investment projects of the firm and that the acceptance of any proposals or group of investment proposals does not change the relative risk of the firm. The investment decision will be either to accept or to reject the proposals. These criteria can be classified as follows :
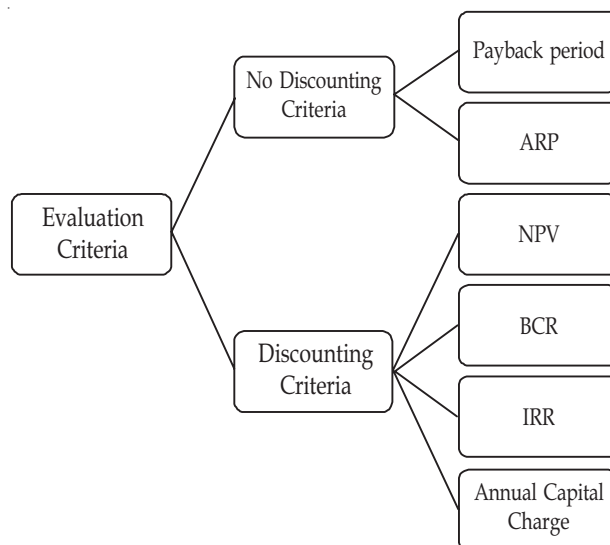
Pay-Back Period (PBP)

The pay back period of an investment tells us the number of years required to recover our initial cash investment. It can be written as :

$$\text{Pay Back Period} = \frac{\text{Initial Fixed Investment}}{\text{Annual Cash Inflows (if equal installments)}}$$

If the pay back period calculated is less than some maximum acceptable pay-back period then the proposal is accepted if not it is rejected. However, in most of the cases firms specify the cut off, so a good project may be rejected. Another drawback of this method is it does not consider time value of money and it does not consider cash flows beyond payback time. So no useful result is obtained form it. However a new payback method has been introduced which takes time value of money into account, known as discounted payback method.

Accounting Rate of Return (ARR)

Accounting rate of return can be defined as the ratio of the average profit after tax to the average book value of investment. Firm accepts the project if its accounting rate of return exceed the target average rate of return.

Internal Rate of Return (IRR)

It can be defined as the rate of return at which NPV = 0.

Because of the various shortcomings in the average rate of return and pay back methods, it generally is felt that discounted cash-flow method provide a more objective basis for evaluating and selecting investment projects. This method takes account of both the magnitude and timing of expected cash-flows in each period of a project's life. In this method the internal rate of return for an investment proposal is the discounted rate that equates the present value of expected cash outflows with the present value of the expected inflows.

$$\sum_{t=o}^{N} \left(\frac{At}{(1+r)^t} \right) = o$$

Where At is the cash flows for the period t, where it maybe a net outflow or inflow, and N is the last period in which a cash flow is expected. 'r' is the required rate of return.

The acceptance criteria generally employed with the internal rate of return method is to compare the internal rate of return with a required rate of return, also known as the cutoff rate, or hurdle rate. If the internal rate of return exceeds the required return, the project is accepted; if not the project is rejected. For one period project IRR gives correct result (where IRR = C1 / C0 - 1). But in most of the cases when IRR is very high for a project all NPV also becomes higher than that, so it becomes impossible to draw the conclusion. The pitfalls of IRR are:

Lending borrowing — IRR is the same for lending and borrowing but NPV lines are in different directions.

Multiple rates of return — for changing signs of CF's there may be more than one IRR's for the same project.

Mutually exclusive projects — projects with higher IRR need not have higher NPV and a different rate NPV gives different ranking.

IRR non existent — for some CF's IRR may not exist.

Assumption about expected rate of return—to solve for IRR we will have to assume that different expected returns gives same results $(r_1 = r_2 = r_3 \ldots\ldots)$, indicating a flat term structure.

Net Present Value (NPV)

This is also a discounted cash flow approach. With the present-value method, all cash flows are discounted to present value, using the required rate of return. The net present value of an investment proposal is

$$\sum_{t=o}^{N} \left(\frac{At}{(1+r)^t} \right) = NPV$$

Where, r = required rate of return.

If the sum of these discounted cash flows is zero or more, the proposal is accepted, if not, it is rejected.

Another way to express the acceptance criterion is to say that the project will be accepted if the present value of cash inflows exceeds the present value of cash out flows.

Profitability index (PI)

The profitability index, or benefit cost ratio, of a project is the present value of future cash flows over initial outlay. It is expressed as follows:

BCR = PV / I

Where the BCR = Benefit Cost Ratio

PV = Present value of future cash flows

I = Initial investment

If BCR > 1 the project is accepted, if not it is rejected.

GENESIS OF DISINVESTMENT IN INDIA :

Disenchantment with public sector started in 1970s. It was observed in many countries that the performance of the public enterprises was far below the expectations. The weakness and defects of public enterprises started manifesting with grave danger to Government and economy in many countries, with no solution in sight. So there started, the reversal of trend in this decade. By the mid 1980 globally the political opinion was veering round to the view that proportion of GNP due to Government economic activity should be reduced to the extent possible and business activities should be left to private sector as far as possible.

During the 1980s, collapse of the socialist economy of the Soviet block, introduction of economic reform by Russia, East European countries and China knocked the bottom out of protagonists of Government intervention in every commercial activity for the benefit of the masses.

India, for almost four decades was pursuing a path of development in which public sector was expected to be the engine of growth. But by mid-eighties their short comings and weaknesses started manifesting in the form of low capacity utilization, low efficiency, lack of motivation, over-manning, huge time and cost overrun, inability to innovate and take quick decision, large scale political and bureaucratic interference in decision making *etc.* But instead of trying to remove these defects and to increase the rate of growth of national economy, gradually the concept of self-reliant growth was given a quiet burial. The Government started to deregulate the imports by reducing or withdrawing import duty in phases. This resulted in dwindling of precious foreign exchange reserve to abysmally low level. The foreign debt repayment crisis compelled Government of India to raise loan from IMF against physical deposit of RBI gold reserve, on conditions harmful to the interest of the country.

Thus started the reversal of policies towards PSU. The Industrial policy of 1991 started the process of delicensing and except 18 industries, Industrial licensing was withdrawn. The market was opened up to domestic private capital and foreign capital was provided free entry up to 51% equity in high technology areas. The aim of economic liberalization was to enlarge competition and allowing new firms to enter the market. Thus the emphasis shifted from PSEs to liberalization, of economy and gradual disinvestment of PSEs. A paradigm shift of Government's economic policy orientation originated in 1991 from a foreign debt servicing crisis.

Rationale for Disinvestment

Because of burgeoning revenue deficit in Central Budget year after year on account of current revenue expenditure on items such as interest payments, wages and salaries of Government employees and subsidies, the Government is left with hardly any surplus for capital

expenditure on social and physical infrastructure. Huge amount of public resources are blocked in several non-strategic PSEs giving meager return. Government is forced to commit further resources for sustenance of many non-viable PSEs in absence of exit route. Above all it has to service huge amount of outstanding debt before any money is available for investment in infrastructure. All these Government economic woes led to an obviously straight forward option of divestment of Government stake in PSEs.

- Releasing large amount of public resources locked up in non-strategic PSEs.
- Stopping further outflow of resources for sustaining unviable PSEs.
- Reducing burgeoning public debt.
- Transferring commercial risk to private sector.

The other benefits expected to be derived from privatization are:

- Disinvested companies would be exposed no market discipline and they would become more efficient and survive or will cease on their own.
- Disinvestment would have a beneficial effect on the capital market.
- New private investor will put in more money in privatized PSEs and economic activity will increase.
- Consumers will be benefited as they would have more choices and cheaper and better quality products and services.

The quantum of divestment of equity in PSEs was gradually increased from 20% to 49% to 76% and 100% in some cases. From divestment of Government stake to other PSEs, Financial Institutions *etc.*, Government has now adopted the path of strategic sale of PSEs to private industrialists.

The main features of Government's present Policy towards Public sector are:

- Restructure and revive potentially viable PSEs.
- Close down PSEs which cannot be revived.
- Bring down Government equity in all Non-strategic PSEs to 26% or lower, if necessary.
- Fully protect the interests of workers.

The issues regarding disinvestment which are still being debated and which will remain relevant in the coming days are :

- Which areas should not be divested.
- Whether defence, production & services should be disinvested and to what extent it is desirable in view of national security.
- To what extent the method of divestment can be made open and transparent.
- Out of the various methods of divestment which path will lead to fulfillment of declared objectives.
- Should the foreign private investors be allowed to acquire controlling interest in PSEs.
- How the social security net be instituted to train and re-employ active and able employees retiring under VRS.

2.9 Role of Treasury Function

This section includes :

- **Scope of Treasury Management Function**
- **The Key Treasury Challenges**
- **Strategic Determinants of the Capital Structure**

INTRODUCTION :

For finance and treasury functions, the agenda is changing fast. Change is being forced with rapid economic developments, globalizing industries and competition, new technologies and revolutionary changes in the regulatory environment. As well as responding to these forces, finance and treasury functions are under pressure to add value to the organization through their operations and contribute to achieving strategic goals.

With significant developments that have taken place in the financial markets in the recent years affecting volatility in exchange rates and accentuating liquidity constraints, corporates have started paying closer attention to the treasury and foreign exchange (forex) management. Corporate treasury function is playing a pivotal role in financial risk management, exposure management and the use of hedging strategies are now all seen as essential requirements.

The concept of corporate treasury is defined through a comparison of traditional and emergent roles. The management accountants' main task in cementing the treasury's strategic role are:

a. to facilitate communications and understanding of strategic possibilities;

b. to aid implementation through the use of diagnostics, and

c. the development of gap and sustaining strategies.

These emerging strategies are linked by one fundamental objective i.e., to attract and retain competitively sought-after investor capital or, in other words, increase shareholder wealth. In a world where investor capital has more choice and mobility than ever before, the key to corporate survival and growth lies in organizational change initiatives that will contribute directly to the economic value of the firm and its ability to satisfy the financial return requirements of its investors. Increasingly, treasury and treasury management practices are being aligned with and integrated into, the business strategies of organizations. It should not be surprising to see corporate treasury and treasury strategies involved in organizational change.

Therefore, whilst ensuring the effective management of all forms of risks, treasury managers must also be able to use and apply financial products in order to maximize profit. With the ever-increasing range and complexity of financial instruments available, treasury managers must constantly update their skills in order to effectively undertake their crucial duties.

SCOPE OF TREASURY MANAGEMENT FUNCTION :

In today's context, the scope of treasury management function is quite vast, and it continues to expand, as can be seen from the following listing. A treasury manager should be able to

understand and appreciate the links between business strategy, organization and finance / treasury.

1. Cash and Liquidity Management

a.   Cash flow dynamics, cash flow forecasting, cash flow valuations

b.   Short-term funding investment

c.   Cash Management: transactions, pooling and netting

d.   Working Capital Management

e.   Using Debt Instruments

2.   Foreign Exchange Risk Management

a.   International Economics and International Finance

b.   International Financial Markets and Instruments

c.   Foreign Exchange: Swaps and Forwards

d.   Vanilla and Exotic Foreign Exchange Options

3.   Financial Risk Management

a.   Interest and Currency Risks

b.   Interest Rates: Forwards, Futures and Options

c.   Interest Rate Swaps and applications

d.   Managing Currency Risks with Forward, Futures, Options and Swaps.

4.   Macroeconomic Policy Environment

a.   Understanding of macroeconomic policies

b.   Understanding of how macroeconomic policies affect prices and costs in the economy

c.   Current scenario and future outlook for India and globally

5.   Other aspects in Treasury Management

a.   Role in accounting policy formation eg. Forex transactions, Mutual Fund Investments, etc.

b.   Formation of Policies and Processes (Investment, Forex Management, Accounting, etc.,)

c.   Accounting Policies on recognition of Treasury Transactions

d.   Accounting Standards on various foreign exchange techniques under US and Indian GAAP

e.   Taxation issues, eg. Withholding tax on interest paid on overseas borrowings, treatment of capital gains/loss on investments, etc.

THE KEY TREASURY CHALLENGES :

The world is increasingly global in level of connectivity and every day the pace of information moves faster than the one before. Treasury is at the heart of the organization and directly challenged by these external forces. The challenges include the following (extracted from Accenture's Brochure on Treasury management services):

Expanding risk coverage

The range of risks that the treasury function is now expected to cover has expanded. As well as traditional risks such as foreign exchange, funding, liquidity and counterparty risk, the treasury function is increasingly likely to manage commodity price risk, insurance and pension risks.

Ensuring the policy is still relevant

The treasury policy is the road map for the treasury function and it must keep pace with overall business strategy ensuring that the appropriate risks are identified, the right processes are in place for managing and mitigating those risks and that roles and responsibilities are clearly defined and communicated.

Performance reporting

Reporting and measuring performance is often seen as an additional burden on the overstretched treasury department. Well thought out metrics and indicators, along with a robust reporting framework, can not only be used to measure the performance of the function, but can also help drive high performance.

Reducing the risk of operational errors

The treasury function frequently manages complex, high-value transactions under tight time constraints, which can create the potential for operational errors leading to significant financial loss. An operational risk framework that captures, categorizes and analyzes loss events is pertinent to both the banking and corporate world.

Achieving a clear view of the global cash position

Organizations operate on a progressively global basis. As a result it becomes increasingly challenging to manage a central view of all banking arrangements. Depending on the relative autonomy of different business units, it may not always be practical simply to rationalize all global accounts. Other cash management methods-such as payment factories and in-house banking- may offer a more successful solution.

Enabling timely and accurate cash flow forecasts

Having an accurate and timely view of the global cash position is vital for effective cash flow planning, and requires effective communication between business units. The treasurer may also provide valuable input into the longer term forecasting and budgeting processes and must work closely with the finance function.

Meeting strategic plans

Creating a funding program that is sufficiently flexible and responsive to achieve strategic objectives requires the corporate treasury function to make sure that its knowledge and understanding of the group business plans are consistent with the level, diversity, nature and maturity of the debt program it has in place.

Optimizing return on investment

With far more options available than simple bank deposits, the treasury function has to ensure that it is using the right instruments and investment methods that can fit both the risk profile and the required level of returns within the appropriate time frame.

High-performance treasury functions drive operational excellence throughout all levels of the organization. They are streamlined and flexible. They manage risk effectively, and they are able to contribute to the achievement of strategic business goals at the same time as ensuring that all statutory duties are met and compliance obligations are fulfilled.

The article titled "Treasury Organisation: Picking the Right Model", published by HSBC's Guide to Cash and Treasury Management in Asia Pacific 2004, appended at the end of chapter will further illustrate some of the concepts discussed in the chapter.

STRATEGIC DETERMINANTS OF THE CAPITAL STRUCTURE :

Main Aim: Maximising Market valuation of the firm.

- Asset Liability (ST/LT) mismatch should not be there;

- Nature of Industry: Funding of Seasonal needs may deviate from above theory;

- Degree of competition; More weightage on Equity if more volatile, low entry barriers, high degree of competition etc;

- Obsolescence: If high, Capital Structuring needs to be more conservative;

- Product Life Cycle; At venture stage, Equity is more preferred;

- Financial policy: Management policy on Maximum D/E, DSCR, Div Pay-out ... etc

- Past and Current Capital Structure: It is not a day-to-day decision on the debt equity mix changes; it is altered not in Short term. It is only a Medium Term policy;

- Dilution of ownership by issuance of more equity exposes for take-over;

- Credit Rating;

2.10 Contemporary Developments

This section includes :

- **WTO**
- **GATT**
- **TRIMS**
- **TRIPS**
- **SEBI Regulations**

INTRODUCTION :

In 1947, 23 countries signed the General Agreement on Tariffs and Trade (GATT) in Geneva. To join GATT, countries must adhere to Most Favored Nation (MFN) clause, which requires that if a country grants a tariff reduction to one country; it must grant the same concession to all other countries. This clause applies to quotas also.

WTO :

The new organization, known as the World Trade Organization (WTO), has replaced the GATT since the Uruguay Round Accord became effective on January 1, 1995. Today, WTO's 135 members account for more than 95% of world trade. The five major functions of WTO are:

- Administering its trade agreements
- Being a forum for trade negotiations
- Monitoring national trade policies
- Providing technical assistance and training for developing countries
- Cooperating with other international organizations

Under the WTO, there is a powerful dispute-resolution system, with three-person arbitration panel. Some of the major features of WTO and GATT are :

- World Trade Organization (WTO), was formed in 1995, head quartered at Geneva, Switzerland
- It has 152 member states
- It is an international organization designed to supervise and liberalize international trade
- It succeeds the General Agreement on Tariffs and Trade
- It deals with the rules of trade between nations at a global level
- It is responsible for negotiating and implementing new trade agreements, and is in charge of policing member countries' adherence to all the WTO agreements, signed by the bulk of the world's trading nations and ratified in their parliaments.

- Most of the WTO's current work comes from the 1986-94 negotiations called the Uruguay Round, and earlier negotiations under the GATT. The organization is currently the host to new negotiations, under the Doha Development Agenda (DDA) launched in 2001.

- Governed by a Ministerial Conference, which meets every two years; a General Council, which implements the conference's policy decisions and is responsible for day-to-day administration; and a director-general, who is appointed by the Ministerial Conference.

THE GENERAL AGREEMENT ON TARIFFS AND TRADE (GATT) :

- GATT was a treaty, not an organization.

- Main objective of GATT was the reduction of barriers to international trade through the reduction of tariff barriers, quantitative restrictions and subsidies on trade through a series of agreements.

- It is the outcome of the failure of negotiating governments to create the International Trade Organization (ITO).

- The Bretton Woods Conference had introduced the idea for an organization to regulate trade as part of a larger plan for economic recovery after World War II. As governments negotiated the ITO, 15 negotiating states began parallel negotiations for the GATT as a way to attain early tariff reductions. Once the ITO failed in 1950, only the GATT agreement was left.

- The functions of the GATT were taken over by the World Trade Organization which was established during the final round of negotiations in early 1990s

TRADE-RELATED INVESTMENT MEASURES (TRIMS) :

TRIMs are the rules a country applies to the domestic regulations to promote foreign investment, often as part of an industrial policy.

- It is one of the four principal legal agreements of the WTO trade treaty.

- It enables international firms to operate more easily within foreign markets.

- In the late 1980's, there was a significant increase in foreign direct investment throughout the world. However, some of the countries receiving foreign investment imposed numerous restrictions on that investment designed to protect and foster domestic industries, and to prevent the outflow of foreign exchange reserves.

- Examples of these restrictions include local content requirements (which require that locally-produced goods be purchased or used), manufacturing requirements (which require the domestic manufacturing of certain components), trade balancing requirements, domestic sales requirements, technology transfer requirements, export performance requirements (which require the export of a specified percentage of production volume), local equity restrictions, foreign exchange restrictions, remittance restrictions, licensing requirements, and employment restrictions. These measures can also be used in connection with fiscal incentives. Some of these investment measures distort trade in violation of GATT Article III and XI, and are therefore prohibited.

TRADE RELATED ASPECTS OF INTELLECTUAL PROPERTY RIGHTS (TRIPS) :

TRIPS is an international agreement administered for the first time by the World Trade Organization (WTO) into the international trading system

It sets down minimum standards for many forms of intellectual property (IP) regulation.

Till date, it remains the most comprehensive international agreement on intellectual property

It was negotiated at the end of the Uruguay Round of the General Agreement on Tariffs and Trade (GATT) in 1994.

TRIPS contains requirements that nations' laws must meet for: copyright rights, including the rights of performers, producers of sound recordings and broadcasting organizations; geographical indications, including appellations of origin; industrial designs; integrated circuit layout-designs; patents; monopolies for the developers of new plant varieties; trademarks; trade dress; and undisclosed or confidential information. TRIPS also specify enforcement procedures, remedies, and dispute resolution procedures.

In 2001, developing countries were concerned that developed countries were insisting on an overly-narrow reading of TRIPS, initiated a round of talks that resulted in the Doha Declaration: a WTO statement that clarifies the scope of TRIPS; stating for example that TRIPS can and should be interpreted in light of the goal "to promote access to medicines for all."

SECURITIES AND EXCHANGE BOARD OF INDIA (SEBI) :

The burgeoning growth of the stock markets in India has necessitated the establishment of a separate regulating agency for the securities market. Accordingly, Indian Government has passed the Securities & Exchange Board of India Act, 1992 to provide the establishment of the Securities & Exchange Board of India on the lines of Securities Exchange Commission of USA to protect the interests of investors in securities and to promote the development of and to regulate the securites market.

- SEBI is an autonomous body created by the Government of India in 1988 and given statutory form in 1992 with the SEBI Act 1992.

- Its Head office is in Mumbai and has regional offices in Chennai, Kolkata, and Delhi.

- SEBI is the regulator of Securities markets in India.

- SEBI has to be responsive to the needs of three groups, which constitute the market:
  - the issuers of securities
  - the investors
  - the market intermediaries.

- SEBI has three functions rolled into one body quasi-legislative, quasi-judicial and quasi-executive.

- It drafts regulations in its legislative capacity, it conducts investigation and enforcement action in its executive function and it passes rulings and orders in its judicial capacity.

- Though this makes it very powerful, there is an appeal process to create accountability. There is a Securities Appellate Tribunal which is a three member body.

- A second appeal lies directly to the Supreme Court.

SEBI's functions also include

- promoting investors' education,

- training of intermediaries of secuities markets,

- prohibiting fradulent and unfair trade practices relating to dealings in securities,

- prohibiting insider trading in securities,

- regulating substantial acquisition of shares and take-overs of companies etc.

In pursuance of its powers SEBI has formulated guidelines and regulations relating to:

- merchant bankers,

- bankers to an issue,

- registrars to issue,

- share transfer agents,

- debentures trustees,

- underwriters,

- FIIs,

- insider trading,

- registration of brokers,

- guidelines of portfolio management services,

- capital adequacy guidelines,

- guidelines for mutual funds,

- guidelines for asset management companies,

- guidelines relating to disclosure and investor protection,

- book building,

- substantial acquisition of shares and takeovers,

- depositories and participants etc.

Students may go through the relevant websites for latest information on SEBI.

Study Note - 3

FINANCIAL ANALYSIS AND PLANNING

3.1 Funds Flow Analysis

This Section includes :

- **Meaning and concept of Funds**
- **Meaning and Definition of Fund Flow Statement**
- **Funds Flow Statement - Position in India**
- **Significance, Importance and Uses of Funds Flow Statement**
- **Cash Flow Statement**

INTRODUCTION :

Every business concern prepares two basic financial statements at the end of accounting period, namely the Balance Sheet or position Statement and Profit and Loss Account or Income Statement. Balance Sheet reveals the financial position of the business concern at a certain point of time. It reveals the financial status of the business concern. The assets side of a Balance Sheet shows the deployment of resources of an undertaking while the liabilities side indicates its obligations i.e., the manner in which these resources obtained. The Profit and Loss Account or Income Statement reveals the net results of operations over a period of time i.e., how much profit was earned (or loss sustained) by the business enterprise during the accounting period.

The Balance Sheet provides only a static view of the business. It is a statement of assets and liabilities on a particular date. It does not show the movement of funds. In business concerns, funds flow from different sources and similarly funds are invested in various sources of investment. It is a continuous process. The study and control of this funds flow process is the main objective of financial management to assess the soundness and solvency of a business tell little about its flow of funds, i.e., financing and investing activities over the related period. Like the Balance Sheet, even the Profit and Loss Account does not depict the changes that have taken place in financial condition of a business concern between two dates. Hence there is a need to prepare an additional statement to know the changes in assets, liabilities and owners' equity between dates of two Balance Sheets. Such a statement is called Funds Flow Statement or Statement of Sources and uses of funds or where come and where gone statement.

The funds flow statement, which is also known as the Statement of Changes in financial position, is yet another tool of analysis of financial statements.

MEANING AND CONCEPTS OF FUNDS :

Funds Flow Statement is a widely used tool in the hands of financial executives for analysing the financial performance of a business concern. Funds keep on moving in a business which itself is based on a going concern concept.

The term Funds has a variety of meanings.

(a) In a narrow sense - In a narrow sense *fund* means only cash. Funds Flow Statement prepared on this basis is called as *Cash Flow Statement*. In this type of statement only in flow and outflow of cash is taken into account.

(b) In a broader sense - In a broader sense the term *fund* refers to money value in whatever form it may exist. Here *funds* mean all financial resources in the form of men, materials, money, machinery etc.

(c) Popular sense - In a popular sense the term funds means Working Capital I.e., the excess of current assets over current liabilities. When the funds move inwards or outwards they cause a flow or rotation of funds. Here the word fund means net working capital. In short, if funds mean working capital, then the statement prepared on the basis is called Funds Flow Statement.

The concepts of funds as working capital is the most popular one and in this chapter we shall refer to fund working capital and a funds flow statement as a statement of sources and application of funds.

MEANING AND DEFINITION OF FUNDS FLOW STATEMENT :

Funds Flow Statement is prepared to study the changes in the financial position of a business over a period of time generally one year. Funds Flow Statement reveals both inflow and outflow of funds. The inflow of funds is known as **sources of the funds** and the outflow of funds means **uses or application of the funds.** Funds flow statement is also known as *Statement of sources and Applications of funds* or where got-where gone statement. Funds Flow Statement highlights and changes in the financial structure of an undertaking. It determines the financial consequences of business operations.

Funds Flow Statement gives detailed analysis of changes in distribution of resources between two Balance Sheet dates. This statement is widely used by the financial analysists and credit granting institutions and financial and financial managers in performing their jobs. Thus, Funds, Flow Statement, in general is able to present that information which either is not available or not readily apparent from an analysis of other financial statements.

Definitions

A statement of sources and application of funds is a technical device designed to analyse the changes in the financial condition of a business enterprise between two dates.   *- Foulke*

Funds Flow Statement describes the sources from which additional funds were derived and the use to which these sources were put.   **- Anthony**

A statement of changes in financial position or statement of sources and application of funds in which element of net income and working capital contribution to an understanding of the whole of financial operations during the reporting period replace totals of these items. **- Kotler**

A statement either prospective or retrospective, setting out the sources and applications of the funds of an enterprise. The purpose of the statement is to indicate clearly the requirements of funds and how they are proposed to be raised and the efficient utilisation and application of the same.

FUNDS FLOW STATEMENT - POSITION IN INDIA :

The Funds Flow Statement is now regarded as an important part of financial reporting. The necessity of this statement is now undoubtedly realised by all owners, managements, investors and others. In India, though the funds flow statement or statement of changes in financial position has not so far become a part of the financial reporting, banks and financial institutions are insisting when a company approaches them for loans.

In India, under the existing legal requirements, companies are under no legal obligation to publish a statement of changes in financial position along with their financial statement. However there is a growing practice to publish such statement along with financial statement especially in the case of companies listed on the stock exchanges and other large commercial, industrial and business concerns in the public and private sectors.

SIGNIFICANCE, IMPORTANCE AND USES OF FUNDS FLOW STATEMENT :

Funds flow statement is prepared to know the changes in assets, liabilities and owners equity between dates of two Balance Sheets. It is a statement of sources and uses of funds. Funds Flow Statement is also known as Statement of Sources and Application of funds or movement of Funds Statement etc.

Funds flow statement reveals both inflow and outflow of funds. The inflow of funds is known as Sources of the funds and the outflow of funds means uses or Application of the funds.

In other words Financial Statement gives detailed analysis of changes in the distribution of resources between two dates.

It is very useful tool in the financial managers analytical kit. It provides a summary of management decisions on financing activities of the firm and investment policy. The following are the advantages of Funds Flow Statement.

1. **Analysis of financial operations** - The Funds Flow Statement reveals the net affect of various transactions on the operational and financial position of the business concern. It determines the financial consequences of business operations. This statement discloses the causes for changes in the assets and liabilities between two different points of time. It highlights the effect of these changes on the liquidity position of the company.

2. **Financial policies** - Funds Flow Statement guides the management in formulating the financial policies such as dividend, reserve etc.

3. **Control device** - It serves as a measure of control to the management. If actual figures are compared with budgeted/projected figures, management can take remedial action if there are any deviations.

4. **Evaluation of firm's financing** - Funds Flow Statement helps in evaluating the firm's financing. It shows how the funds were obtained from various sources and used in the past. Based on this, the financial manager can take corrective action.

5. **Acts as a future guide** - Funds Flow Statement acts as a guide for future, to the management. It helps the management to know various problems it is going to face in near future for want of funds.

6. **Appraising the use of working capital** - Funds Flow Statement helps the management in knowing how effectively the working capital put into use.

7. **Reveals financial soundness** - Funds Flow Statement reveals the financial soundness of the business to the creditors, banks, financial institutions.

8. **Changes in working capital** - Funds Flow Statement highlights the changes in working capital. This helps the management in framing its investment policy.

9. **Assessing the degree of risk** - Funds Flow Statement helps the bankers, creditors, financial institutions in assessing the degree of risk involved in granting the credit to the business concern.

10. **Net results** - This statement reveals the net results of operations during the year in terms of cash.

National Association of Accountants (NAA)-National Association of Accountants states the following uses of Funds Flow Statement :

(i)   Estimating the amount of funds needed for growth.

(ii)   Improving the rate of income on assets.

(iii)   Planning the temporary investment of idle funds.

(iv)   Securing additional working capital when needed.

(v)   Securing economies in the centralised management of cash in organisation whose management is centralised.

(vi)   Planning the payment of dividends to shareholders and interest to creditors.

(vii)   Easing the effects of an insufficient cash balance.

Limitations of Funds Flow Statement

The following are the important limitations of Funds Flow Statement

1.   Funds Flow Statement is not a substitute of Income Statement or a Balance Sheet. It furnished only some additional information as regards changes in working capital.

2. This statement lacks originality. It is simply rearrangement of data appearing in account books.

3. It indicates only the past changes. It can not reveal continuous changes.

4. When both the aspects of the transaction are current, they are not considered.

5. When both the aspects of the transaction are non-current, even then they are not included in funds flow statement.

6. Some Management Accountants are of the opinion that this statement is not ideal tool for financial analysis.

7. Funds Flow Statement is historic in nature. Hence this projected funds flow statement cannot be prepared with much accuracy.

Sources of Funds

1. *Issue of share capital* - If there is any increase in share capital it denotes issue of additional shares during the period. Issue of shares is a source of funds as it constitutes inflow of funds. Even calls received on partly paid shares constitute an inflow of funds. If shares are issued at premium, the premium will also become a source of fund.

   Note - If shares are issued and allotted for other than cash, consideration do not generate fund.

2. *Issue of debentures of long term loans* - Issue of debentures, accepting public deposits, and raising long term loans results in the flow of funds.

   Note - If debentures like shares have been allotted to some body other than cash, consideration do not generate fund.

3. *Sale of fixed assets or long term investments* - When any fixed asset like Land, Building, Machinery, Furniture on long term investments etc. are sold, it generate funds and becomes a source of funds.

4. *Non-trading income* - Any non-trading receipts like dividends, rent, interest etc.,

5. *Decrease in working capital* - If working capital is decreased during the accounting period, when compared with previous period, it denotes release of funds from working capital and it constitutes a source of funds.

APPLICATION OR USE OF FUNDS :

1. *Redemption of preference share capital* - If there is any decrease in preference share capital during current year, when compared with previous year, we must assume that the preference shares are redeemed. It results in the outflow of funds and is taken as Application of funds.

2. *Redemption of debentures* - If any debentures are redeemed during the account period, it constitute application of funds.

3. *Repayment of long-term loans* - Repayment of long-term loan also constitute an application of funds.

4. *Purchase of fixed assets or long term investments* - If any fixed assets like land, buildings, furniture, long-term investments etc., are purchased for cash, funds outflow from the business.

   Note - If any fixed asset is purchased for a consideration of issue of shares or debentures, it does not involve any funds and hence not an application of funds.

5. *Non-trading payment* - Payment of dividends and tax etc. reduce the working capital and is an application of funds. Mere declaration of dividend or creating a provision for taxation, do not be treated as an outflow of funds.

6. *Any other non-trading payment* - Any payment or expense not related to the trading operations of the business amounts to outflow of funds and also taken as application of funds.

7. *Funds lost in operations* - If there is any loss during the accounting period, it amounts to loss of funds in operations. Such loss of funds in trading operations treated as outflow of funds.

CASH FLOW STATEMENT :

To underline the importance of Funds Flow Statement the Institute of Chartered Accountants of India (ICAI) *issued in June 1981 Accounting Standard - 3* dealing with the *preparation of Statement of changes in financial position during a particular period.* While preparing this statement the term *funds* was defined as *Cash and Cash equipments or working capital.* The main purpose of preparing the Funds Flow Statement is to provide a meaningful link between the Balance Sheet at the beginning and at the end of period and the Profit and Loss Account for the period.

In spite of its importance Accounting Standard - 3 suffers from the following limitations.

1. Accounting Standard - 3 did not provide *any standard format for the preparation of Funds Flow Statement.*

2. When Funds Flow Statement is prepared on cash *basis,* it did not disclose cash flows from *operating, investing and financial activities separately.* It nearly provided information regarding inflows and outflows of funds.

3. Accounting Standard - 3 allowed considerable flexibility regarding the meaning of the term Funds. As a result some business concerns prepared *this statement on working capital basis, whereas others prepared it on cash basis.* However most of the business firms prepared this statement on working capital basis. Working capital includes items like *inventories and prepaid expenses which are not easily convertible into cash within a short period.* Further these items do not contribute to the ability of the firm to pay the short term obligations as and when they become due.

Due to these limitations there was a need for cash flow statement prepared in standard format. *The Financial Accounting Standard Board, U.S.A. also stressed the need of preparing the cash flow statement in standard form.*

In June 1995 the Securities and Exchange Board of India (SEBI) amended clause 32 of the listing agreement requiring every listed company to submit along with Balance sheet and Profit and Loss Account, a Cash Flow Statement prepared in the prescribed format showing separately cash flow from operating activities, investing activities and financing activities.

Recognizing the importance of cash flow statement, the Institute of Chartered Accountants of India issued Accounting Standard - 3 Revised in March 1997. This revised accounting standard supercedes Accounting Standard-3 changes in financial position issued in 1981.

Revised Accounting Standard - 3 has given the objectives of the Cash Flow Statement are as under.

Information about the cash flows of an enterprise is useful in providing users of financial statements with a basis to assess the ability of the enterprise to generate cash and cash equivalents and the needs of enterprises to utilize those cash flows. The economic decisions that are taken by users require an evaluation of the ability of an enterprise to generate cash and cash equivalents and the timing and certainty of their generation.

This statement deals with the provision of information about the historical changes in cash and cash equivalents of an enterprise by means of a cash flow statement which classified cash flows during the period from operating, investing and financing activities.

Meaning - Cash Flow Statement reveals the causes of changes in cash position of business concern between two dates of Balance Sheets. According to Accounting Standard - 3 (Revised) an enterprise should prepare a cash flow statement and should present it for each period with financial statements prepared. AS-3 (Revised) has also given the meaning of the words cash, cash equivalent and cash flows.

1. *Cash* - This includes cash on hand and demand deposits with banks.

2. *Cash equivalents* - This includes purely *short term and highly liquid investments* which are readily convertible into cash and which are subject to an insignificant risk of changes in value. Therefore an investment normally qualifies as a cash equivalent only when it has a short maturity, of say three months or less.

3. *Cash flows* - This includes inflows and outflows of cash and cash equivalents. If the effect of transaction results in the increase of cash and its equivalents, it is called an inflow (source) and if it results in the decrease of total cash, it is known as outflow (use cash of).

Classification Of Cash Flows

According to AS-3 (Revised) cash flows are classified into three main categories:

1. Cash flows from operating activities.
2. Cash flows from investing activities.
3. Cash flows from financing activities.

1. **Cash flows from operating activities** - Operating activities are the principal revenue-producing activities of the enterprise and other activities that are not investing or financing activities.

The amount of cash flows arising from operating activities is a key indicator of the extent to which the operations of the enterprise have generated sufficient cash flows to maintain the operating capability of the enterprise, pay dividends, repay loans, and make new investments without recourse to external sources of financing.

Cash flows from operating activities are primarily derived from the principal revenue-producing activities of the enterprise. The following are the important operating activities.

   (i) Cash receipts from the sale of goods and the rendering of services.

  (ii) Cash receipts from royalties, fees, commissions and other revenue.

 (iii) Cash payments to suppliers for goods and services.

 (iv) Cash payments to and on behalf employees.

  (v) Cash receipts and cash payments of an insurance enterprise for premiums and claims, annuities and other policy benefits,

 (vi) Cash payments or refunds of income taxes unless they can be specifically identified with financing and investing activities and

(vii) Cash receipts and payments relating to future contracts, forward contracts, option contracts and swap contracts when the contracts are held for dealing or trading purposes.

(viii) Some transactions such as the sale of an item of plant, may give rise to a gain or loss which is included in the determination of net profit or loss. However, the cash flows relating to such transactions are cash flows from investing activities.

An enterprise may hold securities and loans for dealing or trading purposes, in which case they are similar to inventory acquired specifically for sale. Therefore, cash flows arising from the purchase and sale of dealing or trading activities are classified as operating activities. Similarly cash advances and loans made by financial enterprises are usually classified as operating activities since they relate to the main revenue producing activity of that enterprise.

2. **Cash flows from investing activities** - Investing activities are the *acquisition and disposal of long-term assets and other investments* not included in cash equivalents. The separate disclosure of cash flows arising from investing activities is important because the cash flows represent the extent to which expenditures have been made for resources intended to generate future income and cash flows.

Examples of cash flows arising from investing activities are

  (i) Cash payments to acquire fixed assets (including intangibles). These payments include those relating to capitalised research & development costs and self constructed fixed assets.

 (ii) Cash receipts from disposal of fixed assets (including intangibles)

(iii) Cash payments to acquire shares, warrants, or debt instruments of other enterprises and interests in joint ventures.

(iv) Cash receipts from disposal of shares, warrants, or debt instruments of other enterprises and interests in joint venture.

(v) Cash advances and loans made to third parties (other than advances and loans made by a financial enterprise).

(vi) Cash receipts from the repayment of advances and loans made to third parties (other than advances and loans of a financial enterprise).

(vii) Cash payments for future contracts, forward contracts, option contracts, and swap contracts except when the contracts are held for dealing or trading purposes or the payments are classified as financing activities and

(viii) Cash receipts from future contracts, forward contracts, option contracts and swap contracts except when the contracts are held for dealing or trading purpose, or the receipts are classified as financing activities.

When a contract is accounted for as a hedge of an identifiable position, the cash flows of the contract are classified in the same manner as the cash flows of the position being hedged.

3. **Cash flows from financing activities** - Financing activities are activities *that result in changes in the size and composition of the owners capital* (including preference share capital in the case of a company) *and borrowing of the enterprise.*

    The separate disclosure of cash flows arising from financing activities is imporant because it is useful in predicting claims on future cash flows by providers of funds (both capital and borrowing) to the enterprise.

Examples Of Cash Flows Arising From Financing Activities Are

(a) Cash proceeds from issuing shares or other similar instruments.

(b) Cash proceeds from issuing debentures, notes, bonds and other short-or long-term borrowings and

(c) Cash repayments of amounts borrowed such as redemption of debentures, bonds, preference shares.

Treatment of some typical items - AS - 3 (Revised) has also provided for the treatment of cash flows from some peculiar items as discussed below :

1. **Extraordinary Items** - The cash flows associated with extraordinary items should be classified as arising from operating, investing or financing activities as appropriate and separately disclosed in the cash flows statement to enable users to understand their nature and effect on the present and future cash flows of the enterprise.

2. **Interest and Dividends** - Cash flows from interest and dividends received and paid should be disclosed separately. Further, the total amount of interest paid during the

period should be disclosed in the cash flow statement whether it has been recognised as an expense in the statement of profit and loss or capitalised. The treatment of interest and dividends received and paid depends upon the nature of the enterprise. For this purpose, the enterprises are classified as (i) Financial enterprises, and (ii) Other enterprises.

(i) **Financial enterprises** - In the case of financial enterprises, cash flows arising from interest paid and interest and dividend received should be classified as cash flows arising from operating activities.

(ii) **Other enterprises** - In the case of other enterprises, cash flows arising from interest paid should be classified as cash flows from **financing activities** while interest and dividends received should be classified as cash flows from **investing activities.**

Dividends paid should be classified as cash flows from financing activities.

3. **Taxes on income** - Cash flows arising from taxes on income should be separately disclosed and should be classified as cash flows from operating activities unless they can be specifically identified with financing and investing activities.

Taxes on income arise on transactions that give rise to cash flows that are classified as operating investing or financing activities in a cash flows statement. While tax expense may be readily identifiable with investing or financing activities, the related tax cash flows are often impracticable to identify and may arise in a different period from the cash flows of the underlying transactions. Therefore, taxes paid are usually classified as cash flows from operating activities. However, when it is practicable to identify the tax cash flow with an individual transaction that gives rise to cash flows that are classified as investing or financing activities the tax cash flow is classified as an investing or financing activity as appropriate. When tax cash flows are allocated to ever more than one class of activity, the total amount of taxes paid is disclosed.

4. **Acquisitions and disposals of subsidiaries and other business units** - The aggregate cash flows arising from acquisitions and from disposals of subsidiaries or other business units should be presented separately and classified as investing activities. An enterprise should disclose, in aggregate in respect of both acquisition and disposal of subsidiaries or other business units during the period each of the following:

(i) The total purchase or disposal consideration and

(ii) The portion of the purchase or disposal consideration discharged by means of cash and cash equivalents.

The separate presentation of the cash flow effects of acquisitions and disposals of subsidiaries and other business units as single line items helps to distinguish those cash flows from other cash flows, the cash flow effects of disposals are not deducted from those of acquisitions.

5. **Foreign currency cash flows** - Cash flows arising from transactions in a foreign currency should be recorded in an enterprise's reporting currency by applying to the foreign currency amount the exchange rate between the reporting currency and the foreign

currency at the date of the cash flow. A rate that approximates the actual rate may be used if the result is substantially the same as would arise if the rates at the dates of the cash flows were used. The effect of changes in exchange rates on cash and cash equivalents held in a foreign currency should be reported as a separate part of the reconciliation of the changes in cash and cash equivalents during the period.

Unrealised gains and losses arising from changes in foreign exchange rates are not cash flows. However, the effect of exchange rate changes on cash and equivalents held or due in a foreign currency is reported in the cash flow statement in order to reconcile cash and cash equivalents at the beginning and the end of the period. This amount is presented separately from cash flows from operating, investing and financing activities and includes the difference, if any had those cash flows been reported at the end of period exchange rates.

6. **Non-cash transactions** - Many investing and financing activities do not have a direct impact on current cash flows although they do affect the capital and asset structure of an enterprise. Examples of non-cash transactions are :

    (a) The acquisition of assets by assuming directly related activities.

    (b) The acquisition of an enterprise by means of issue of shares; and

    (c) The conversion of debt to equity.

Investing and financing transactions that do not require the use of cash or cash equivalents should be excluded from a cash flow statement. Such transactions should be disclosed elsewhere in the financial statements in a way that provides all the relevant information about these investing and financing activities.

Methods of Calculating Cash flows (Used in) Operating Activities

There are two methods of reporting cash flows from operating activities namely (1) Direct Method and (2) Indirect Method.

1. **The Direct Method** - Under the direct method, cash receipts (inflows) from operating revenues and cash payments (outflows) for operating expenses are calculated to arrive at cash flows from operating activities. The difference between the cash receipts and cash payments is the net cash flow provided by (or used in) operating activities. The following are the examples of cash receipts and cash payments (called cash flows) resulting from operating activities :

    (a) Cash receipts from the sale of goods and the rendering of services.

    (b) Cash receipts from royalties, fees commissions and other revenues

    (c) Cash payment to suppliers for goods and services

    (d) Cash payment to and on behalf of employees.

    (e) Cash receipts and cash payment of an insurance enterprise for premiums and claims annuities and other policy benefits.

(f) Cash payments or refund of income taxes unless they can be specifically indentified with financing and investing activities and

(g) Cash receipts and payments relating to future contracts, forward contracts, option contracts and swap contracts when the contracts are held for dealing or trading purposes.

(h) The formation about major classes of gross cash receipts and gross cash payments may be obtained either :

    (i) From accounting records of the enterprise; or

    (ii) By adjusting sales, cost of sales (interest and similar income and interest expense and similar charges for a financial enterprise) and other items in the statement of profit and loss for;

(i) Changes during the period in inventories and operating receivables and payables,

(j) Other non-cash items, and

(k) Other items for which the cash effects are investing or financing cash flows.

Format of Cash Flows Statement - AS-3 (Revised) has not provided any specific format for preparing a cash flows statement. However, an idea of the suggested format can be inferred from the illustrations appearing in the appendices to the accounting standard. The cash flow statement should report cash flows during the period classified by operating, investing and financing activities; a widely used format of cash flow statement is given below:

<div align="center">

Cash Flow Statement (for the year ended.....)

</div>

Particulars	Rs.	Rs.
Cash Flows from Operating Activities		
Cash receipts from customers	xxx	
Cash paid to suppliers and employees	(xxx)	
Cash generated from operations	xxx	
Income tax paid	(xx)	
Cash flow before extraordinary items	xxx	
Extraordinary items	xxx	
Net cash from (used in) Operating activities		xxx
(Or)		
Net profit before tax and extraordinary items	xxx	
Adjustments for non-cash and non-operating items		
(List of individual items such as depreciation,		
foreign exchange loss, loss on sale of fixed assets,		
interest income, dividend income, interest expense etc.)	xxx	

Particulars	Rs.	Rs.
Operating profit before working capital changes	xxx	
Adjustments for changes in current assets and current liabilities		
(List of individual items)	xxx	
Cash generated from (used in) operations before tax	xxx	
Income tax paid	xxx	
Cash flow before extraordinary items	xxx	
Extraordinary items (such as refund of tax)	xxx	
Net Cash from (used in) Operating activities		xxx
Cash Flows from Investing Activities		
Individual items of cash inflows and		
outflows from financing activities	xxx	
(such as purchase/sale of fixed assets, purchase		
or sale of investments,		
interest received, dividend received etc.	xxx	
Net cash from (used in) investing activities		xxx
Cash Flows from Financing Activities		
Individual items of cash inflows and outflows		
from financing activities	xxx	
(such as) proceeds from issue of shares, long-term		
borrowings, repayments		
of long-term borrowings, interest paid, dividend paid etc.)	xxx	xxx
Net increase/ (decrease) in cash and cash equivalents		xxx
Cash and cash equivalents at the beginning of the period		xxx
Cash and cash equivalents at the end of the period		xxx

Format of Cash Flow Statement approved by Sebi is given below:

Cash Flow Statement

(for the year ended.....)

Particulars	Rs.	Rs.
(A) Cash Flow from operating activities		
Net Profit / Loss before tax and extraordinary items		
Adjustments for :		
Depreciation		
Gain / Loss on sale of fixed assets		
Foreign exchange		
Miscellaneous expenditure written off		
Investment income		
Interest		
Dividend		
Operating profit before working capital changes		
Adjustments for :		
Trade and other receivables		
Inventories		
Trade payables		
Cash generated from operations		
Interest paid		
Direct taxes paid		
Cash flow before items extraordinary items		
Net cash from operating activities		
(B) Cash Flow from investing activities		
Purchase of fixed assets		
Sales of fixed assets		
Purchase of investments		
Sale of investments		
Interest received		
Dividend received		
Net cash from / used in investing activities		

(C)   Cash flow from financing activities

Proceeds from issue of share capital

Proceeds from long-term borrowings/banks

Payment of long-term borrowings

Dividend paid

Net cash from / used in financing activities xxx

Net increase / (decrease) in cash and cash equivalents xxx

Cash and cash equivalents as at... (Opening Balance) xxx

Cash and cash equivalent as at.... (Closing Balance) xxx

2. The Indirect Method - Under the indirect method, *the net cash flow from operating activities is determined by adjusting net profit or loss for the effect of :*

(a)   Non-cash items such as depreciation, provisions, deferred taxes, and unrealised foreign exchange gains and losses' and

(b)   Changes during the period in inventories and operating receivables and payables.

(c)   All other items for which the cash effects are investing or financing cash flows.

The indirect method is also called reconciliation method as it involves reconciliation of net profit or loss as given in the profit and loss account and the net cash flow from operating activities as shown in the cash flow statement. In other words, net profit or losses adjusted for non-cash and non-operating items which may have been debited or credited to profit and loss account as follows.

Calculation of Cash Flow From Operating Activities

Particulars	Rs.	Rs.
Cash Flows from Operating activities		
Cash receipts from customers	xxx	
Cash paid to suppliers and employees	(xxx)	
Cash generated from operations	xxx	
Income tax paid	(xx)	
Cash flow before extraordinary items	xxx	
Extraordinary items	xxx	
Net cash from (used in) Operating activities		xxx
(Or)		

Particulars	Rs.	Rs.
Net profit before tax and extraordinary items		xxx
Add : Non-cash and non-operating items which have already been debited to P.L. Account		
(a) Depreciation	xxx	
(b) Transfer to reserves and provisions	xxx	
(c) Goodwill written off	xxx	
(d) Preliminary expenses written off	xxx	
(e) Other intangible assets written off such as discount or loss on issue of shares / debentures, underwriting commission etc.		xxx
(f) Loss on sale or disposal of fixed assets	xxx	
(g) Loss on sale of investments	xxx	
(h) Foreign exchange loss	xxx	
Less : Non-cash and non-operating items	xxx	xxx
which have already been credited to P.L. Account		
(a) Gain on sale of fixed assets	xxx	
(b) Profit on sale of investments	xxx	
(c) Income from interest or dividends on investments	xxx	
(d) Appreciation	xxx	
(e) Reserves written back	xxx	
(f) Foreign exchange gain	xxx	xxx
		xxx
Operating Profit Before Working Capital Changes		
Adjustments for changes in current operating assets and liabilities:		
Add : Decrease in Accounts of Current Operating Assets		
(except cash and cash equivalents) such as :		
Decrease in trade debts	xxx	
Decrease in bills receivables	xxx	
Decrease in inventories / stock-in-trade	xxx	
Decrease in prepaid expenses etc.	xxx	
Add : Increase in accounts of current operating liabilities		
(except Bank overdraft) such as :		
Increase in creditors	xxx	
Increase in bills payable	xxx	
Increase in outstanding expenses	xxx	xxx
		xxxx

Particulars	Rs.	Rs.
Less : Increase in accounts of current operating assets		
(as stated above)	xxx	
	xxx	
Less : Decrease in accounts of current operating liabilities		
(as stated above)	xxx	
	xxx	xxx
Cash generated from (used in) operations before tax		xxx
Less : Income tax paid		xxx
Cash flows before extraordinary items		xxx
Add / Less : Extraordinary items if any		xxx
Net cash flow from (used in) operating activities		xxx

Important note to Students

1.	An increase in liability	Cash inflow
2.	A decrease in liability	Outflow of cash
3.	An increase in an asset	Outflow of cash
4.	A decrease in an asset	Cash inflow

Need of Preparing Cash flow Statement

Funds Flow Statement highlights the changes that have taken place in the financial structure of the business concern since the last reporting date. In other words Funds Flow Statement takes into account the inflow and outflow of funds in terms of working capital, during the period under consideration. Funds Flow Statement did not reveal the quantum of inflow and outflow of cash. In short it did not explain the changes in cash balance.

The cash plays an important role in the business firm's economic life. What blood is to human body, cash is to business enterprise. Therefore, the major responsibility of financial management of the business firm is to maintain adequate cash in the business is one of the prerequisites for successful operation. A business firm needs cash to make payments for purchase of goods or raw materials, to meet day to day expenses and to pay salaries, wages, interest and dividends etc. The movement of cash is of vital importance to management. If the inflows of cash are not sufficient to meet the outflows of cash, the firm cannot meet its current obligations. Hence the need of proper planning and control of cash flow arises. Cash constitutes the basic foundation of all business transactions without which the other components of current assets have little significance. Hence there is a need for cash analysis. For analysis of cash, a separate statement is to be prepared known as cash flow statement.

In a narrow sense the term Funds means cash and the statement of changes in the financial position prepared on cash basis is called a Cash Flow Statement.

Cash Flow Statement is a statement of cash flow. Cash flow studies the movements of cash in and out of a business concern. Inflow of cash is known as source and outflow of cash is called use of cash. The term Cash here stands for cash and bank balance.

Cash Flow Statement shows the changes in cash position between two Balance Sheet dates. It provides the details in respect of cash generated through operating, investing and financial activities and utilised for operating, investing and financial activities. The transactions which increase the cash position of the business are known as Inflows of cash (ex : Sale of current and fixed assets, Issue of shares and debentures etc.) The transactions which decrease the cash position are known as outflows (ex : Purchase of current and fixed assets, redemption of debentures, and preference shares and other long term debts). Cash Flow Statement concentrates on transactions that have a direct impact on cash. This statement depicts factors responsible for such inflow and out of flow of cash. In brief, cash flow statement summaries the causes of changes in cash position between dates of two balance sheets.

1. Cash Flow Statement reveals the causes of changes in cash balances between two balance sheet dates.

2. This statement helps the management to evaluate its ability to meet its obligations i.e., payment to creditors, the payment of bank loan, payment of interest, taxes, dividend etc.

3. It throws light on causes for poor liquidity in spite of good profits and excessive liquidity in spite of heavy losses.

4. It helps the management in understanding the past behaviour of cash cycle and in controlling the use of cash in future.

5. Cash Flow Statements helps the management in planning repayment of loans, replacement of assets etc.

6. This statement is helpful in short-term financial decisions relating to liquidity.

7. This statement helps the management in preparing the cash budgets properly.

8. This statement helps the financial institution who lends advances to business concerns in estimating their repaying capacities.

9. Since a Cash Flow Statement is based on the cash basis of accounting it is very useful in evaluation of cash position of a firm.

10. Cash Flow Statement discloses the complete story of cash movement. The increase in, or decrease of cash and the reason therefore can be known.

11. Cash Flow Statement provides information of all activities such as operating, investing, and financing activities separately.

12. Since Cash Flow Statement provides information regarding the sources and utilisation of cash during a particular period, it is easy for the management to plan carefully for

the cash requirements in the future, for the purpose of redeeming long-term liabilities or / and replacing some fixed assets.

13. A projected Cash Flow Statement reveals the future cash position of a concern. Through this cash flow statement the firm can know how much cash it can generate and how much cash will be needed to make various payments.

14. Cash Flow Statement prepared according the AS-3 (Revised) is more suitable for making comparison than the funds flow statements as there is no standard formats used for the same.

Limitations of Cash Flow Statement

Cash Flow Statement suffers from the following limitations.

1. A Cash Flow Statement only reveals the inflow and outflow of cash. The cash balance disclosed by the Cash Flow Statement may not represent the real liquid position of the concern.

2. Cash Flow Statement is not suitable for judging the profitability of a firm as non-cash changes are ignored while calculating cash flows from operating activities.

3. Cash Flow Statement is not a substitute for Income Statement or Funds Flow Statement. Each of them has a separate function to perform. Net Cash Flow disclosed by cash flow statement does not necessarily be the net income of the business, because net income is determined by taking into account both cash and non-cash items.

4. Cash Flow Statement is based on cash accounting. It ignores the basic accounting concept of and accrual basis.

5. Cash Flow Statement reveals the movement of cash only. In preparation it ignores most liquid current assets (ex: Sundry debtors, Bills Receivable etc.)

6. It is difficult to precisely define the term cash. There are controversies among accountants over a number of *near cash items* like cheques, stamps, postal orders etc., to be included in cash.

7. Cash Flow Statement does not give a complete picture of financial position of the concern.

Differences between Funds Flow Statement and Cash Flow Statement

The following are the main differences between a Funds Flow Statement and a Cash Flow Statement.

Funds Flow Statement	Cash Flow Statement
1. Funds Flow Statement reveals the change in working capital between two balance sheet dates	Cash Flow Statement reveals the changes in cash position between two balance sheet dates.
2. Funds Flow Statement is based on accounting	Cash Flow Statement is based on cash basis of accounting
3. In the case of Funds Flow Statement a schedule of changes in working capital is prepared.	No such schedule of changes in working capital is prepared for a Cash Flow Statement.
4. Funds Flow Statement is useful in planning, Intermediate and long term financing.	Cash Flow Statement as a tool of financial analysis is more useful for short-term analysis and cash planning.
5. Funds Flow Statement deals with all components of working capital.	Cash Flow Statement deals only with cash and cash equivalents.
6. Funds Flow Statement reveals the sources and application of funds. The difference represents net increase or decrease in working capital.	Cash Flow Statement is prepared by taking into consideration the inflows and outflows in terms of operating, investing and financing activities. The net difference represents the net increase or decrease in cash and cash equivalents.

PROBLEMS AND SOLUTIONS

Illustration 1

The following are the balance sheets of the Andhra Industrial Corporation Ltd. as on 31st December 2008 and 2009.

BALANCE SHEET

Assets :	2008	2009
Fixed Assets: Property	1,48,500	1,44,250
Machinery	1,12,950	1,26,200
Goodwill	——	10,000
Current Assets: Stock	1,10,000	92,000
Trade Debtors	86,160	69,430
Cash at Bank	1,500	11,000
Pre-payments	3,370	1,000
	4,62,480	**4,53,880**
Liabilities :		
Shareholders funds: Paid up Capital	2,20,000	2,70,000
Reserves	30,000	40,000
Profit and Loss Account	39,690	41,220
Current Liabilities: Creditors	39,000	41,660
Bills Payable	33,790	11,000
Bank Overdraft	60,000	— —
Provision for taxation	40,000	50,000
	4,62,480	**4,53,880**

During the year ended 31st December, 2009, a divideNd of Rs. 26,000 was paid and assets of another company were purchased for Rs. 50,000 payable in fully paid-up shares. Such assets purchased were :

Stock Rs. 21,640; Machinery Rs. 18,360; and goodwill Rs. 10,000. In addition Plant at a cost of Rs. 5,650 was purchased during the year; depreciation on property Rs. 4,250; on Machinery Rs. 10,760. Income tax during the year amounting to Rs. 28,770 was charged to provision for taxation. Net profit for the year before tax was Rs. 76,300.

   Prepare a statement of changes in Financial Position of the Co.

Solution :

Funds Flow Statement

Sources		Applications	
Issue of shares for stock	21640	Increase in working capital	52530
Funds from operation	91310	Purchase of machinery	5650
		Tax paid	28770
		Dividend paid	26000
	112950		112950

Working notes no 1:

Provision for tax Account

To cash paid	28770	By P&L a/c (b/f)	38770
To balance c/d	50000	By balance b/d	40000
	78770		78770

Working notes no 2: Verification of P & L A/c Balance

1.	Opening P & L a/c		39690
	(+) net profit as per P & L a/c	76300	
	(-) provision for tax	38770	
		37530	
	(-) dividend	26000	
	(-) transfer to reserve	10000	
	Retained	1530	
	Profit at the end of the year	41220	

Working notes no. 3: Changes in working capital

	Opening	Closing
Current assets :		
Stock	110000	92000
Debtors	86160	69430
Cash	1500	11000
Prepaid	3370	1000
	201030	173430
Current liabilities		
Creditors	39000	41660
Bills payable	33790	11000
Overdraft	60000	_____
	132790	52660
Net working capital	68240	120770
Increase in working capital	52530	

Working notes no. 4: Depreciation provided during the year

On property	4250
On machinery	10760
	15010

Working notes no. 5: Purchase/sale of fixed assets

	Property	Machinery	
WDV opening	148500	112950	
(-) depreciation	4250	10760	
		102190	
(+) purchases	Nil	18360	(by issue of shares)
		5650	(by cash)
WDV at the end	144250	126200	

Working notes no. 6 :

P & L adjustment a/c

To depreciation	15010	By balance b/d	39690
To dividend	26000	By funds from operations(b/f)	91310
To transfer to reserve	10000		
To provision for tax	38770		
To balance c/d	41220		
	131000		131000

Illustration 2

From the fallowing figures, prepare a statement showing the changes in the working capital and funds flow statement during the year 2009.

ASSETS :	Dec. 31, 2008	Dec. 31, 2009
Fixed Assets (net) Rs.	5,10,000	6,20,000
Investments	30,000	80,000
Current Assets	2,40,000	3,75,000
Discount on debentures	10,000	5,000
	7,90,000	10,80,000

Liabilities :

Equity share capital	3,00,000	3,50,000
Preference share capital	2,00,000	1,00,000
Debentures	1,00,000	2,00,000
Reserves	1,10,000	2,70,000
Provision for doubtful debts	10,000	15,000
Current liabilities	70,000	1,45,000
	7,90,000	**10,80,000**

You are informed that during the year:

    a. A machine costing Rs.70,000 book value Rs.40,000 was disposed of for Rs.25,000.

    b. Preference share redemption was carried out at a premium of 5% and

    c. Dividend at 15% was paid on equity shares for the year 2008.

Further :

    1. The provision for depreciation stood at Rs. 1,50,000 on 31.12.08 and at Rs. 1,90,000 on 31.12.09; and

    2. Stock which was valued at Rs. 90,000 as on 31.12.08; was written up to its cost, Rs. 1,00,000 for preparing profit and loss account for the year 2009.

Solution :

Funds Flow Statement

Sources		Applications	
Sale of fixed assets	25000	Increase in working capital	50000
Funds from operation	295000	Purchase of fixed assets	220000
Issue of shares	50000	Purchase of investments	50000
Debentures	100000	Redemption of preference shares	105000
		Dividend paid	45000
	<u>470000</u>		<u>470000</u>

Working note No. 1 : Changes in working capital

	2008	2009
Current assets	240000	375000
(+) Stock under valued	<u>10000</u>	
	<u>250000</u>	<u>375000</u>
Current liabilities	70000	145000
Net working capital	180000	230000
Increase in working capital	50000	

Working note No. 2 : Depreciation

Opening Provision	150000
(-) provided on sale of asset	30000
	120000
(+) provided during the year (b/f)	70000
Closing provision	190000

Working note No. 3 : Purchase & sale of fixed assets

Opening (2008)	510000
(-) sold	40000
	470000
(-) depreciation provided	70000
	400000
(+) purchases (b/f)	220000
Closing 2009	620000

Working note No. 4 :

P&L adjustment a/c

To depreciation	70000	By balance b/d (110000+10000)	120000
To Loss on sale of fixed assets	15000	By funds from operations (b/f)	295000
To loss on redemption of shares	5000		
To discount written off	5000		
To provision for R.B.D	5000		
To dividend	45000		
To balance c/d	270000		
	415000		415000

Illustration 3

The directors of Chintamani Ltd. present you with the Balance sheets as on 30th June, 2008 and 2009 and ask you to prepare statements which will show them what has happened to the money which came into the business during the year 2009.

Liabilities :	30.6.08	30.6.09
Authorised capital 15,000 shares of Rs. 100 each	15,00,000	15,00,000
Paid up capital	10,00,000	14,00,000
Debentures (2009)	4,00,000	—
General Reserve	60,000	40,000
P & L Appropriation A/c	36,000	38,000
Provision for the purpose of final dividends	78,000	72,000

Sundry Trade Creditors	76,000	1,12,000
Bank Overdraft	69,260	1,29,780
Bills Payable	40,000	38,000
Loans on Mortgage	– –	5,60,000
	17,59,260	**23,89,780**
Assets :		
Land & Freehold Buildings	9,00,000	9,76,000
Machinery and Plant	1,44,000	5,94,000
Fixtures and Fittings	6,000	5,500
Cash in hand	1,560	1,280
Sundry Debtors	1,25,600	1,04,400
Bills Receivable	7,600	6,400
Stock	2,44,000	2,38,000
Prepayments	4,500	6,200
Share in other companies	80,000	2,34,000
Goodwill	2,40,000	2,20,000
Preliminary expenses	6,000	4,000
	17,59,260	**23,89,780**

You are given the following additional information :

a. Depreciation has been charged (i) on Freehold Buildings @ 2½% p.a. on cost Rs. 10,00,000. (ii) on Machinery and plant Rs. 32,000 (iii) on Fixtures and Fittings @5% on cost, Rs. 10,000. No depreciation has been written off on newly acquired Building and Plant and Machinery.

b. A piece of land costing Rs. 1,00,000 was sold in 2009 for Rs. 2,50,000. The sale proceeds were credited to Land and Buildings.

c. Shares in other companies were purchased and dividends amounting to Rs. 6,000 declared out of profits made prior to purchase has received and use to write down the investment (shares).

d. Goodwill has been written down against General Reserve.

e. The proposed dividend for the year ended 30th June 2008 was paid and, in additions, an interim dividend, Rs. 52,000 was paid.

Solution :

Funds Flow Statement

Sources		Applications	
Decrease in working capital	121500	Purchase of land and building	351000
Sale proceed of land	250000	Purchase of plant and machinery	482000
Dividend received	6000	Purchase of shares	160000
Issue of shares	400000	Redemption of debentures	400000
Loan	560000	Dividends for 2008 paid	78000
Funds from operations	185500	Interim dividend paid	52000
	1523000		1523000

Working note No. 1 : Changes in working capital

	2008	2009
Current assets		
Cash	1560	1280
Debtors	125600	104400
Bills receivable	7600	6400
Prepaid	4500	6200
Stock	244000	238000
	383260	356280
Current liabilities		
Creditors	76000	112000
Overdraft	69260	129780
Bills payable	40000	38000
	185260	279780
Working capital	198000	76500
Decrease in working capital		121500

Working note No. 2 :

	Depreciation
On buildings	25000
On plant & machinery	32000
On furniture & fittings	500
	57500

Working note No. 3 : Purchase or sale of fixed assets / Investments :

Land and buildings :

2008 (WDV)	900000
(-) depreciation	25000
	875000
(-) land sold	100000
	775000
(+) purchases (b/f)	351000
	1126000
(-) profit on sale	150000
2009 (WDV)	976000

Plant & machinery :

WDV	144000
(-) depreciation	32000
	112000
(+) purchase (b/f)	482000
	594000

Investments :

2008	80000
(-) dividend in capital nature	6000
	74000
(+) purchases (b/f)	160000
2009	234000

Working note No. 4:

P & L adjustment a/c

To depreciation	57500	by balance b/d	36000
To dividend proposed	72000	by funds from operation (b/f)	185500
To preliminary expenses written off	2000		
To interim dividend	52000		
To balance c/d	38000		
	221500		221500

Illustration 4

The following are the summarised balance sheets of A Limited as on 31st December.

	2008	2009		2008	2009
6% Preference shares redeemable at 10% premium	1,00,000	80,000	Fixed assets at cost	2,40,070	2,53,730
Ordinary shares	75,000	1,20,000	Less: Dep.	90,020	98,480
Plant replacement reserve	15,000	10,000		1,50,050	1,55,250
Profit & Loss A/c	1,00,350	1,02,700	Subsidiary co. shares at cost	61,000	76,000
6% Debentures	—	40,000	Stock	98,000	1,04,000
Bank Loan	22,000	—	Debtors	88,000	85,000
Creditors accruals	84,450	75,550	Cash	11,750	32,000
Proposed ordinary dividends	12,000	24,000			
	4,08,800	4,52,250		4,08,800	4,52,250

You are informed that during 2009

a. Rs.25,000 part of un-appropriated balance on profit and loss account was capitalized and applied in paying up Rs.0.25 per share on the issued ordinary shares making them fully paid up.

b. On 31st December 20,000 preference shares were redeemed at the specified premium out of the proceed of a right issue of 20,000 new ordinary shares issued for cash at Rs.1 per share. The premium was written off to profit and loss account.

c. The movement on plant replacement reserve represents a transfer to profit and loss account.

d. The ordinary dividend for the year 2008 was paid in addition to interim dividend on the ordinary shares thus absorbing Rs.4,000. The preference dividend was paid on 31st December in each year.

e. In regard to fixed assets (i) Rs. 3,000 was added to the book value of a property following a revaluation, and credited to profit and loss account (ii) expenditure totaling Rs. 1,700 which at 31-12-2008 had been carried forward in suspense (included in "debtors") was transferred to fixed assets. (iii) depreciation of fixed assets of Rs. 13,260 was charge to profit and loss account, and (iv) plant (cost Rs. 6,000 depreciation provided Rs. 4,800) was sold for Rs. 250 and the loss written off to profit and loss account.

f. The increase in the investment in the subsidiary company represents the cost of additional shares purchased during the year.

You are required to prepare a statement showing the sources and applications of fund during the year.

Solution :

Funds Flow Statement

Sources		Applications	
Sale proceeds of fixed asset	250	Increase in working capital	33850
Issue of ordinary shares	20000	Purchase of	
Issue of Debentures	40000	fixed assets	14960
Funds from operations	69560	investments	15000
		Redemption of preference shares	22000
		Bank loan repaid	22000
		Dividends paid (2008)	12000
		Interim dividend paid	4000
		Preference dividend	6000
	129810		129810

Working note No. 1 :   Changes in working capital

	2008	**2009**
Current assets :		
Stock	98000	104000
Debtors	86300	85000
Cash	11750	32000
	196050	221000
Current liabilities :		
Creditors	84450	75550
Working capital	111600	145450
Increase in working capital	33850	

Working note No. 2 : Depreciation

Fixed assets

Accumulated dep (2008)	90020
(+) provided	13260
	103280
(-) provided on plant sold	4800
Closing 2009	98480

Working note No. 3: Purchase or sale of fixed assets and investments:

Fixed assets (WDV)	150050
(-) Depreciation provided	13260
	136790
(-)WDV of asset sold	1200
	135590
(+) profit on revaluation	3000
	138590
(+) capital expenditure	1700
	140290
(+) additions (b/f)	14960
	155250
Subsidiary Co-Shares 2008	61000
(+) purchased (b/f)	15000
Closing 2009	76000

Working note No. 4 :

P& L adjustment a/c

To depreciation	13260	by balance b/d	100350
To premium on redemption of		by transfer from reserve	5000
Preference shares	2000	by profit on revaluation	3000
To bonus shares	25000	by funds from operation (b/f)	69560
To proposed dividend	24000		
To Interim dividend	4000		
To preference dividend	6000		
To loss on sale of plant	950		
To balance c/d	102700		
	177910		177910

Illustration 5

The following is the Balance Sheet of ABC Ltd.,

(Rs. in lakhs)

Liabilities	As at 30.6.08	As at 30.6.09	Assets	As at 30.6.08	As at 30.6.09
Share Capital (Equity shares of Rs. 100 each)	10.00	20.00	Plant	13.00	18.00
10% redeemable shares of Rs. 100 each	7.50	2.50	Stock	8.00	9.50
Share premium	0.50	0.25	Debtors	15.00	14.50
Cap. Red. Reserve	0.00	5.00	Bank Balance	3.00	2.50
Reserve	8.00	4.50	Miscellaneous	1.00	1.00
P & L A/c	3.00	5.00			
Provision for taxation	5.00	6.00			
Current Liabilities	6.00	2.25			
	40.00	45.50		40.00	45.50

The following further information is furnished :

a. The Company declared a dividend of 20% for the year ended 30th June 2008 to equity shareholders on 30th September, 2008. Dividend on preference share capital for the year ended 30th June, 2008 was paid on 30th June, 2008.

b. The company issued notice to preference shareholders holding preference shares of the face value of Rs.5 lakhs for redemption at a premium of 5% on 1st December, 2008 and the entire proceedings were completed before 31-12-2008 in accordance with the law.

c. The company provided depreciation at 10% on the closing balance of plant. During the year one plant whose book value was Rs.2,00,000 was sold at a loss of Rs.30,000.

d. Miscellaneous expenditure incurred during the year ended 30th June 2009 Rs.25,000 for share issue and other expenses.

e. A sum of Rs.4 lakhs has been provided for taxation during the year.

Prepare statement of sources and application of funds for the year ended 30th June, 2009. Also prepare a statement showing changes in working capital.

Solution :

Funds Flow Statement

Sources		Applications	
Sale of fixed assets	170000	Increase in working capital	425000
Funds from operations	1255000	Purchase of fixed assets	900000
Issue of equity	1000000	Redemption preference shares	525000
		Tax paid	300000
		Equity Dividend 2008	200000
		Preference dividend 2009	50000
		Miscellaneous expenditure	25000
	2425000		2425000

Working note No. 1: Changes in working capital

	2008	2009
Current assets		
Stock	800000	950000
Debtors	1500000	1450000
Bank	300000	250000
	2600000	2650000
Current liabilities	600000	225000
Working capital	2000000	2425000
Increase in working capital	425000	

Working note No. 2: Depreciation

WDV of fixed assets @ 90 %	1800000
For 100 %	2000000
Therefore depreciation provided	200000

Working note No. 3: Purchase or sale of fixed assets

Fixed assets	1300000
(-) depreciation	200000
(-) book value of asset sold	200000
	900000
(+) additions (b/f)	900000
	1800000

Working note No. 4:   **P & L adjustment a/c**

To depreciation	200000	By balance b/d	300000
To transfer to reserve	150000	By funds from operations (b/f)	1255000
(950000- 800000)			
To provision for tax	400000		
To miscellaneous expenditure written off	25000		
To loss on sale of assets	30000		
To equity dividend 2008	200000		
To preference dividend 2009	50000		
To balance c/d	500000		
	1555000		1555000

Illustration 6

The summarised balance sheet of Ex Ltd., as on 31st December, 2007 and 2008 are as follows:

Liabilities	31-12-07	31-12-08	Assets	31-12-07	31-12-08
Share Capital	3,00,000	4,00,000	Fixed Assets:		
Capital Reserve	—	10,000	Cost	8,00,000	9,50,000
General Reserve	1,70,000	2,00,000	Less: Dep.	2,30,000	2,90,000
Profit & Loss Account	60,000	75,000		5,70,000	6,60,000
Debentures	2,00,000	1,40,000	Trade Investments	1,00,000	80,000
Liabilities for goods & services	1,20,000	1,30,000	Current Assets	2,80,000	3,30,000
Provision for Income tax	90,000	85,000	Preliminary Expenses	20,000	10,000
Proposed Dividends	30,000	36,000			
Unpaid Dividend	—	4,000			
	9,70,000	10,80,000		9,70,000	10,80,000

During 2008, the Company:

1. Sold one machine for Rs.25,000 the cost of the machine was Rs.50,000 and the depreciation provided on it amounted to Rs.21,000.

2. Provided Rs.95,000 as depreciation.

3. Redeemed 30% of Debentures @103.

4. Sold some trade investments at a profit credited to capital reserve.

5. Decided to value the stock at cost where as previously the practice was to value stock at cost less 10%. The stock according to books on 31-12-07 was Rs.54,000, the stock on 30.12.08 was Rs.75,000 was correctly valued at cost.

You are required to prepare the statement of sources and application of funds during 2008.

Solution

Funds Flow Statement

Sources		Applications	
Sale of fixed assets	25000	Increase in working capital	34000
Sale of investments	30000	Purchase of fixed assets	214000
Funds from operation	270800	Dividend paid	26000
Issue of shares	100000	Redemption of debentures	61800
		Tax paid	90000
	425800		**425800**

Working note No. 1: Changes in working capital

	2007	2008
Current assets	280000	330000
Under valued Stock	6000	
	286000	330000
Current liabilities:		
Goods and services	120000	130000
Working capital	166000	200000
Increase in working capital	34000	

Working note No. 2 : Depreciation

2007	230000
(+) provided	95000
	325000
(-) depreciation on asset sold	21000
	304000
(-) depreciation on asset discarded	14000
	290000

Working note No. 3 : Purchase or sale of fixed assets and investments

=> Fixed assets 2007	800000
(-) cost of asset sold	50000
(-) cost of asset discarded	14000
	736000
(+) additions (b/f)	214000
Closing 2008	950000
=> Trade investments(2007)	100000
(-) cost of investment sold	20000
2008	80000
Sale proceed of investments	30000

Working note No. 4:

P & L Adjustment a/c

To depreciation	95000	By Balance b/d	66000
To reserve	30000	By Funds from operation (b/f)	270800
To premium on redemption (6,000×30%)	1800		
To tax provision	85000		
To proposed dividend	36000		
To preliminary expense written off	10000		
To loss on sale of machinery	4000		
To balance c/d	75000		
	336800		336800

Illustration 7

From the following Balance Sheet of M/s Anu Ltd. as on 31-12-07 and Fund Flow Statement for the year ended 31-12-08. You are required to prepare the Balance Sheet of M/s Anu Ltd. as on 31-12.08.

BALANCE SHEET AS ON 31-12-07

Liabilities	Rs.	Assets	Rs.
Equity Share Capital	2,00,000	Free hold land at cost	60,000
8% Preference Share Capital	50,000	Plant & Machinery, at cost	2,50,000
Share Premium	10,000	Stock	50,000
General Reserve	25,000	Sundry Debtors	22,000
P & L appropriation A/c	20,000	Cash and Bank	15,000
Provision for Depreciation on			
Plant & Machinery A/c	60,000		
Provision for Taxation	10,000		
Sundry Creditors	22,000		
	3,97,000		**3,97,000**

FUNDS FLOW STATEMENT FOR THE YEAR ENDED 31-12-08

Sources		Applications	
Net profit as per P & L A/c	26,000	Redemption of 8% Pref. Shares	
		at a premium of 10%	55,000
Add-back non fund charges:		Purchase of Machinery	1,30,000
Dep. on plant & Machinery	40,000	Purchase of Furniture	24,000
Loss on sale of Machinery	5,000	Appropriation of Current	
		year's Net Profit for 'Provision	
		for Taxation'	9,000
	71,000	Increase in Working Capital	13,000
Less: Profit on sale of land	10,000		
	61,000		
Issue of Equity Shares at a			
premium of 5%	1,05,000		
Sale of Machinery	25,000		
Sale of Land	40,000		
	2,31,000		**2,31,000**

Notes :

a) The actual amount of Tax paid and charged to provision for Taxation account was Rs.9,000

b) The accumulated Depreciation on Machine sold on the date of sale was Rs.15,000

c) Furniture was purchased on 31-12-08.

d) The total of Current Assets on 31-12-08 was Rs. 1,10,000. Stock, Debtors and Bank were in the ratio of 8:2:1.

Solution

Balance sheet as on 31 – 12 -2008

Liabilities			Assets		
Equity share capital		300000	Land	60000	
			(-) cost of land sold	30000	30000
Share premium	10000	10000	Plant & machinery	250000	
(+) on equity	5000		(+)Purchases	130000	
(-) on preference	5000		(-) cost of machine sold	45000	
			(-) depreciation	85000	250000
General reserve		25000	Stock		80000
P & L appropriation	46000		Debtors		20000
(-) tax provision	9000	37000			
Provision for tax		10000	Bank		10000
Creditors		32000	Furniture		24000
		414000			**414000**

Working note No. 1:   Changes in Working Capital

	2007	2008
Current assets	87000	110000
Current liabilities	22000	32000
Working capital	65000	78000
Increase in working capital	13000	

Illustration 8

Balance Sheet of X Ltd. as at 31-3-08

Rs. in lakhs

Equity Share Capital (Rs.10 Share)	10	Land & Buildings		4
10% Pref. Share Capital	1	Plant and machinery		10
General Reserve	3	Investment in subsidiary shares		3
Investment Allowance Reserve	2	Stock		6
Capital Redemption Reserve	1	Debtors	6	
P & L A/c	2	Less: Provision	0.3	5.7
12% Bonds	4	Marketable Securities		1.5
Creditors	3	Cash and bank		2
Tax provision	5	Prepaid expenses		0.3
Proposed equity Dividend	2	Discount on shares		0.5
	33			**33**

Projected profit and loss a/c for the year ended on 31-3-09

Rs. in lakhs

To Opening Stock		6	By Sales	40
To Purchases		20	By closing stock	8
To Wages		3	By Income from investment	1
To Factory expenses		5	By Profit on sale of plant (WDV 2)	1
To Admn. & Selling exp		2	By profit on sale trade investments (cost 1)	1
To Interest		0.48		
To Depreciation:				
Building		0.2		
Plant		1		
To Provision for doubtful debts		0.1		
To tax provision	6			
Add: past year's short provision	1	7		
To Pref. Dividend		0.1		
To proposed equity dividend		1.5		
To Prem. on redemption of Pref. Shares		0.1		
To General reserve		1		
To Investment allowance reserve		1.5		
To Capital redemption reserve		1		
To discount on shares		0.1		
To Net profit c/d		0.92		
		51		**51**

The following further data are also available.

1. Summary of fixed assets (Rs. lakhs):

	As at 31.3.2008	As at 31.3.2009
Cost (Plant)	14	(Projected) 14.90
Accumulated depreciation	4	4.90
Cost (Building)	5	6.00
Accumulated depreciation	1	1.20

2. Preference share capital was redeemed at the beginning of 2008-09 at a premium of 10%.

3. Debtors velocity is five times and provision for doubtful debts is 5%.

4. Suppliers allow 72 days' credit on an average.

5. Wages and all expenses are paid 15 days in arrears.

6. Prepaid expenses as on 31-3-09 are expected to be Rs.0.50 lakhs.

Required: 1) Projected balanced sheet as at 31-3-09. (2) Funds flow statement. (3) Cash Flow statement (Indirect Method)

Solution :

1)   **PROJECTED BALANCE SHEET AS ON 31- 3 -2009**

		Rs in Lakhs			Rs in Lakhs
Equity share capital		10.000	Land and buildings	6	
			(-) depreciation	1.2	4.800
10%pref share capital	1				
(-) redeemed	1		Plant and machinery	14.9	
			(-) depreciation	4.9	10.000
General reserve	3				
(+) provided	1	4.000	Investment in subsidiary	3	
			(-) sold	1	2.000
Investment allowance	2		Stock		8.000
(+) transfer	1.5	3.500			
Capital redemption reserve	1		Debtors	8	
(+) transfers	1	2.000	(-) RBD	0.4	7.600
P & L a/c	2				
(+) current year profit	0.92	2.920	Marketable securities		1.500
12% bonds		4.000	Cash and bank (b/f)		3.537
Creditors [20(72 / 360)]		4.000	Prepaid expenses		0.500
Tax provision		6.000	Discount on shares	0.5	
			(-) write off	0.1	0.400
Proposed equity dividend [10 x (15 / 100)]		1.500			
o/s wages and expenses		0.417			
		38.337			38.337

2)   **FUNDS FLOW STATEMENT :**

Sources		Applications	
Sale proceeds of plant	3.00	Increase in working capital	4.22
Sale proceeds of investments	2.00	Purchase of plant	3.00
FFO	11.42	Purchase of building	1.00
Income from investments	1.00	Redemption of PSC	1.10
		Tax paid	6.00
		Equity dividend paid	2.00
		Preference dividend paid	0.10
	17.42		17.42

3)   **CASH FLOW STATEMENT (INDIRECT METHOD) :**

<u>Cash from operational activities:</u>		
cash from operations before tax	9.217	
(-) tax paid <u>6.000</u>		3.217
<u>Cash from investment activities:</u>		
Purchase of plant	(3)	
Purchase of building	(1)	
Sale of plant	3	
Sale proceeds of investments	2	
Income from investments	<u>1</u>	2.000
<u>Cash from financial activities:</u>		
Redemption of preference share capital	(1.1)	
Dividend paid : preference	(0.1)	
Equity	(2.0)	
Interest paid	<u>(0.48)</u>	(3.68)
Cash generated during the year		1.537
(+) opening balance		2.000
Closing cash balance		3.537

Working Notes No. 1

- changes in working capital:

	2008	2009
Current assets:		
Stock	6.00	8.00
Debtors	5.70	7.60
Marketable securities	1.50	1.50
Cash and bank balance	2.00	3.53
Prepaid expenses	0.30	0.50
	15.5	21.13
Current liabilities:		
Creditors	3.00	4.00
o/s wages and expenses		0.41
	3.00	4.41
Working capital	12.5	16.72
Increase in working capital	4.22	

Working Notes No. 2

- Depreciation as per P&L a/c on building   0.20
              On plant   1.00
                                1.20

Working Notes No. 3

- Plant:
  Accumulated depreciation at the beginning   4.00
  (+) provided   1.00
                                          5.00
  (-) accumulated depreciation on asset sold   0.10
                                          4.90

- Purchase of building = Rs100000

Working Notes No. 4

- Plant at the beginning   14.00
  (-) cost of plant sold   2.10
                                      11.90
  (+) purchases   3.00
                                      14.90

Working Notes No. 5

Computation of FFO:

NP as per P & L a/c		0.92
(+) depreciation	1.20	
Tax provision	7.00	
Preference dividend	0.10	
Proposed equity dividend	1.50	
Premium on redemption of pref share capital	0.10	
Transfer to general reserve	1.00	
Investment allowance reserve	1.50	
Capital redemption reserve	1.00	
Discount on shares written off	0.10	13.50
		14.42
(-) income from investments	1.00	
Profit on sale of plant	1.00	
Profit on sale of trade investments	1.00	3.00
		11.42

Working Notes No. 6

● Cash from operations :

FFO		11.420
(+) interest	0.480	
Increase in creditors	1.000	
o/s wages	0.417	1.897
		13.317
(-) increase in stock	2.000	
Increase in debtors	1.900	
Increase in prepaid expenses	0.200	4.100
		9.217

3.2 Ratio Analysis

This Section includes :

- **Significance and Classification of Ratios**
- **Advantages of Ratio Analysis**
- **Limitation of Accounting Ratios**
- **DUPONT Control Chart**
- **Difficulties in DU PONT Analysis**

INTRODUCTION :

Accounting ratios are relationships expressed in mathematical terms between figures which are connected with each other in some manner. Obviously, no purpose will be served by comparing two sets of figures which are not at all connected with each other. Over the past few years, financial ratios have been subjected to empirical analysis to find their other uses.

CLASSIFICATION OF RATIOS : Ratios can be classified as

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                    ┌─────────────────────────┐
                    │ Classification in View of│
                    │   Financial Analysis     │
                    └─────────────────────────┘
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Profitability Ratios	Activity Ratios	Solvency Ratios

Profitability Ratios

A) In Relation to Sales
   1. Gross profit Ratio
   2. Operating Ratio
   3. Operating Profit Ratio
   4. Net Profit Ratio
   5. Expense Ratio
B) In Relation to Investment
   1. Return on Investment
   2. Return on Equity Shareholders Fund
   3. Return on Total Resources

Activity Ratios

1. Inventory Turnover Ratio
2. Debtors Turnover Ratio
3. Creditors Turnover Ratio
4. Fixed Assets Turnover Ratio
5. Working Capital Turnover Ratio
6. Capital Turnover Ratio

Solvency Ratios

Long Term Solvency Ratios
1. Debt Equity Ratio
2. Proprietary Ratio
3. Fixed Assets Ratio
4. Capital Gearing Ratio

Short Term Solvency Ratios
1. Current Ratio
2. Liquidity Ratio
3. Interest Coverage Ratio
4. Absolute Liquid Ratio

1. Profitability Ratios

These ratios give an indication of the efficiency with which the operations of business are carried on. The following are the important profitability ratios:

(i) Overall Profitability Ratio

This is also called as Return on Investment (ROI) or Return on Capital Employed (ROCE) ratio. It indicates the percentage of return on the total capital employed in the business. It is calculated as follows:

ROI = Operating Profit/Capital Employed

The term 'Operating Profit' means "profit before interest and tax while the term 'capital employed' refer to the sum-total of long-term funds employed in the business.

Significance of ROI

ROI measures the profit which a firm earns on investing a unit of capital. It is desirable to ascertain this periodically. The profit being the net result of all operations, ROI, expresses all efficiencies or inefficiencies of a business collectively. Thus, it is a dependable measure for judging the overall efficiency or inefficiency of the business.

(ii) Price Earning Ratio (PER)

This ratio indicates the number of times the earning per share is covered by its market price. It is calculated as follows :

$$PER = \frac{\text{Market Price Per Equity Share}}{\text{Earning Per Share}}$$

For example, if the market price of an equity share is Rs. 20 and earning per share is Rs. 5, the price earning ratio will be 4 (i.e., 20÷5). This means for every one rupee of earning people are prepared to pay Rs. 4. In other words, the rate of return expected by the investors is 25%

Significance. PER helps the investors in deciding whether to buy or not to buy the shares of a company at a particular price. For Instance, in the example given, if the EPS falls to Rs. 3, the market price of the share should be Rs. 12 (i.e. 3 × 4). In case the market price of the share is Rs. 15, it will not be advisable to purchase the company's shares at that price.

(iii) Gross Profit Ratio (GPR)

This ratio expresses the relationship between gross profit and net sales. It can be computed as follows:

Significance. The ratio indicates the overall limit within which a business must manage its operating expenses. It also helps in ascertaining whether the average percentage of mark-up on the goods is maintained.

(iv) Net Profit Ratio (NPR)

The ratio indicates net margin earned on a sale of Rs. 100. It is calculated as follows:

$$NPR = \frac{Net\,Profit}{Net\,Sales} \times 100$$

Significance. The ratio helps in determining the efficiency with which the affairs of a business are being managed. Constant increase in the above ratio year after year is a definite indication of improving conditions of the business.

(v) Operating Ratio

This ratio is a complementary of net profit ratio. In case the net profit ratio is 20%, the operating ratio will be 80%. It is calculated as follows:

$$Operating\ Ratio = \frac{Operating\ Cost}{Net\ Sales} \times 100$$

Operating cost includes cost of direct materials, direct labour, direct expenses and all overheads. Financial charges such as interest, provision for taxation, etc. are not to be included in operating cost.

Significance. The ratio is the test of the operational efficiency with which the business has carried on. The operating ratio should be low enough to leave a portion of sales for giving a fair return to the investors.

(vi) Fixed Charges Cover Ratio (FCCR)

The ratio indicates the number of times the fixed financial charges are covered by income before interest and tax. This ratio is calculated as follows :

$$FCCR = \frac{Income\ before\ Interest\ and\ Tax}{Interest}$$

Significance. The ratio is significant from the lender's point of view. It indicates whether the business would earn sufficient profits to pay periodically the interest charges. Higher the ratio, better it is.

(vii) Pay-out Ratio

The ratio indicates what proportion of earning per share has been used for paying dividend. It can be calculated as follows :

$$Pay-out\ Ratio = \frac{Dividend\ per\ equity\ share}{Earning\ per\ equity\ share}$$

Significance. The ratio is an indicator of the amount of earnings that have ploughed back in the business. The lower the pay-out ratio, the higher will be the amount of earnings ploughed back in the business. A lower pay-out ratio means a stronger financial position of the company.

(vii) Dividend Yield Ratio (DYR)

The ratio is calculated by comparing the rate of dividend per share with its market value. It is calculated as follows :

$$DYR = \frac{Divident\ Per\ Share}{Market\ Price\ Per\ Share} \times 100$$

Significance. The ratio helps an intending investor in knowing the effective return he is going to get on his investment. For example, if the market price of a share is Rs. 25, paid-up value is Rs.10 and dividend rate is 20%. The dividend yield ratio is 8 % (i.e. 100 x 2/25). The intending investor can now decide whether it will be advisable for him to go for purchasing the shares of the company or not at the price prevailing in the market.

2. Turnover Ratios

These ratios indicate the efficiency with which capital employed is rotated in the business. The various turnover ratios are as follows:

(i) Over-all Turnover Ratio

The ratio indicates the number of times the capital employed has been rotated in the process of doing a business. The ratio is computed as follows:

$$Overall\ Turnover\ Ratio = \frac{Net\ Sales}{Capital\ Employed}$$

Significance. The overall profitability of a business depends on two factors, viz, (a) the profit margin, and (b)turnover. The profit margin is disclosed by the net profit ratio while the turnover is indicated by the overall turnover ratio. A business with a lower profit margin can achieve a higher ROI if its turnover is high. This is the reason for wholesalers earning a larger return on their investment even when they have a lower profit margin. A business should not, therefore, increase its profit margin to an extent that it results in reduced turn-over resulting in reduction of overall profit.

(ii) Fixed Assets Turnover Ratio

The ratio indicates the extent to which the investment in fixed assets has contributed towards sales. The ratio can be calculated as follows:

$$= \frac{Net\ Sales}{Net\ Fixed\ Assets}$$

Significance. The comparison of fixed assets turnover ratio over a period of time indicates whether the investment in fixed assets has been judicious or not. Of course, investment in fixed assets does not push-up sales immediately but the trend of increasing sales should be visible. If such trend is not visible or increase in sales has not been achieved after the expiry of a reasonable time it can be very well said that increased investments in fixed assets has not been judicious.

(iii) Debtors' Turnover Ratio

The ratio indicates the speed with which money is collected from the debtors. It is computed as follows:

$$= \frac{\text{Credit Sales}}{\text{Average Accounts Receivable}}$$

The term average account receivable includes trade debtors and bills receivable. Average accounts receivable are computed by taking the average receivables in the beginning and at the end of the accounting year. The higher the ratio, better it is.

Debtors turnover ratio is used for computing the debt collection period. The formula for its computation is as follows:

$$= \frac{\text{Months or days in a year}}{\text{Debtors turnover Ratio}}$$

For example, if the credit sales are Rs. 80,000, average accounts receivable Rs. 20,000, the debtors' turn-over ratio and debt collection period will be computed as follows:

$$\textit{Debtors Turnover Ratio} = \frac{80,000}{20,000} = 4$$

$$\textit{Debtors Collection Period} = \frac{12 \text{ months}}{4} = 3 \text{ month}$$

This means on an average three months credit is allowed to the debtors. An increase in the credit period would result in unnecessary blockage of funds and with increased possibility of losing money due to debts becoming bad.

Significance. Debtors Turnover Ratio or Debt Collection Period Ratio measures the quality of debtors since it indicates the rapidity or slowness with which money is collected from the debtors. A shorter collection period implies prompt payment by debtors. A longer collection period implies too liberal and inefficient credit collection performance. The credit policy should neither be too liberal nor too restrictive. The former will result in more blockage of funds and bad debts while the latter will cause lower sales which will reduce profits.

(iv) Creditors Turnover Ratio

This is similar to Debtors Turnover Ratio. It indicates the speed with which payments for credit purchases are made to creditors. It can be computed as follows:

$$= \frac{\text{Credit Purchases}}{\text{Average Accounts Payable}}$$

The term 'accounts payable' include trade creditors and bills payable.

From the creditors turnover ratio, credit period enjoyed can be computed as follows:

$$Credit\ Period = \frac{\text{Months or days in a year}}{\text{Creditors Turnover}}$$

For example, if the credit purchases during a year are Rs. 1,00,000, Average accounts payable Rs. 25,000, the Creditors Turnover Ratio will be '4' (i.e., 1,00,000 / 25,000) while the credit period enjoyed ratio would be 3 months (i.e., 12 months/4).

Significance. The creditors turnover ratio and the credit period enjoyed ratio indicate about the promptness or otherwise in making payment for credit purchases. A higher creditors turnover ratio or a lower credit period enjoyed ratio signifies that the creditors are being paid promptly thus enhancing the credit-worthiness of the company. However, a very favourable ratio to this effect also shows that the business is not taking full advantage of credit facilities which can be allowed by the creditors.

(v) Stock Turnover Ratio

The ratio indicates whether the investment in inventory is efficiently used and whether it is within proper limits. It is calculated as follows:

$$Stock\ Turnover\ Ratio = \frac{\text{Cost of Goods Sold during the year}}{\text{Average Inventory}}$$

Average inventory is calculated by taking the average of inventory at the beginning and at the end of the accounting year.

Significance. The ratio signifies the liquidity of inventory. A high inventory turnover ratio indicates brisk sales and vice-versa. The ratio is therefore a measure to discover possible trouble in the form of over-stocking or over-valuation of inventory.

3. Financial Ratios

They are also termed as 'Solvency Ratios'. These ratios indicate about the financial position of the company. A company is considered to be financially sound if it is in a position to carry on its business smoothly and meet all its obligations both short-term and long-term without

strain. The Financial or Solvency Ratios can therefore be classified into following categories:
(i) Long-term Solvency Ratios, which include fixed assets ratio, debt equity ratio and proprietary ratio;

(ii)Short-term Solvency Ratios, which include current ratio, liquidity ratio, super-quick ratio and defensive interval ratio.

Each of these ratios are now being discussed in detail in the following pages:

Long-term Solvency Ratios

(i) Fixed Assets Ratio

The ratio indicates the extent to which fixed assets have been acquired by use of long-term funds. The ratio is expressed as follows:

$$Fixed\ Assets\ Ratio = \frac{Net\ Fixed\ Assets}{Long\ \text{-}\ term\ Funds}$$

The term 'Net Fixed Assets' means original cost of fixed assets less depreciation to date. The ratio should not be more than '1' . The ideal ratio is .67.

Significance. It is sound principle of finance that fixed assets should be financed out of long-term funds. As a matter of fact a part of working capital termed as core-working capital, should also be financed by long-term funds. The ratio is therefore an indication of the fact whether the company has followed sound financial policy or not. In case the ratio is more than '1', it shows that a part of working capital has also been used to acquire fixed assets, which may prove quite troublesome for the company.

(ii) Debt-Equity Ratio

The ratio is determined to ascertain the proportion between the outsiders' 'funds and shareholders' funds in the capital structure of an enterprise. The term outsiders', funds is generally used to represent total long-term debt. The ratio can be computed as follows:

$$Debt - Equity\ Ratio = \frac{Total\ long\ \text{-}\ term\ Debt}{Shareholder's\ Funds}$$

The ratio may also be calculated for ascertaining proportion of long-term debt in the total long-term funds. In such a case the ratio will be computed as follows:

$$= \frac{Total\ long\ \text{-}\ term\ Debt}{Total\ Long\ \text{-}\ term\ Funds}$$

The ratio is considered to be ideal if the shareholders' funds are equal to total long-term debt. However, these days the ratio is also acceptable if the total long-term debt does not exceed twice of shareholders' funds.

Significance. The ratio is an indication of the soundness of the long-term financial policies pursued by the business enterprise. The excessive dependence on outsiders' funds may cause

insolvency of the business. The ratio provides the margin of safety to the creditors. It tells the owners the extent to which they can gain by maintaining control with a limited investment.

(iii) Proprietary Ratio

It is a variant of Debt-Equity Ratio. It establishes relationship between the proprietors' or shareholders' funds and the total tangible assets. It may be expressed as follows:

$$= \frac{\text{Shareholders Funds}}{\text{Total Tangible Assets}}$$

Significance. The ratio focuses attention on the general financial strength of the business enterprise. The ratio is of particular importance to the creditors who can find out the proportion of shareholders funds in the total assets employed in the business. A high proprietary ratio will indicate a relatively little danger to the creditors or vise-versa in the event of forced reorganization or winding up of the company.

Short-term Solvency Ratios

(i) Current Ratio

The ratio is an indicator of the firm's commitment to meet its short-term liabilities. It is expressed as follows:

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

An ideal current ratio is '2'. However, a ratio of 1.5 is also acceptable if the firm has adequate arrangements with its bankers to meet its short-term requirements of funds. *Significance:* The ratio is an index of the concern's financial stability, since, it shows the extent to which the current assets exceed its current liabilities. A higher current ratio would indicate inadequate employment of funds, while a poor current ratio is a danger signal to the management.

(ii) Liquidity Ratio

The ratio is also termed as Acid Test Ratio or Quick Ratio. The ratio is ascertained by comparing the liquid assets i.e., current assets (excluding stock and prepaid expenses) to current liabilities. The ratio may be expressed as follows:

$$= \frac{\text{Liquid Assets}}{\text{Current Liabilities}} = \frac{\text{Current Assets} - \text{Stock}}{\text{Current Liabilities} - \text{Bank Overdraft}}$$

Some accountants prefer the term liquid liabilities for current liabilities. The term 'liquid liabilities' means liabilities payable within a short period. Bank overdraft and cash credit facilities (if they become permanent modes of financing) are excluded

from current liabilities for this purpose. The ratio may be expressed as follows:

$$= \frac{\text{Liquid Assets}}{\text{Liquid Liabilities}}$$

The ideal ratio is '1'.

Significance: The ratio is an indicator of short-term solvency of the company. A comparison of the current ratio to quick ratio should also indicate the inventory hold-ups. For instance, if two units have the same current ratio but different liquidity ratios, it indicates over-stocking by the concern having low liquidity ratio as compared to the firm which has a higher liquidity ratio.

(iii) Super-quick Ratio

It is a slight variation of quick ratio. It is calculated by comparing the super quick assets with the current liabilities (or liquid liabilities) of a firm. The ratio may be expressed as follows:

$$= \frac{\text{Super Quick Assets}}{\text{Current Liabilities}}$$

The term 'Super-Quick Assets' means current assets excluding stock, prepaid expenses and debtors. Thus, super-quick assets comprise mainly cash, bank balance and marketable securities.

Significance : This ratio is the most rigorous test of a firm's liquidity position. In case the ratio is '1', it means the firm can meet its current liabilities any time.

The ratio is a conservation test and not widely used in practice.

ADVANTAGES OF RATIO ANALYSIS :

Ratio Analysis is (useful) relevant in assessing the performance of a firm in respect of the following purposes:

1. **To measure the liquidity position -** The purpose of ratio analysis is to measure the liquidity position of a firm. Whether the firm is able to meet its current obligations when they become due or not? A firm-can be said to be liquid, if it has sufficient liquid funds to pay the interest charges on short-term debt within a year. The liquidity ratio are useful in credit analysis by banks and other financial institutions.

2. **To know the solvency position -** Ratio analysis is helpful for assessing the long-term financial liability of the firm. The long term solvency is measured through the leverage, and profitability ratios. These ratios reveal the strengths and weaknesses of a firm in respect of the solvency position. The leverage ratios indicates the proportion of various sources of finance in the firms capital structure, particularly the ratio of debt and equity share capital.

3. **Operating efficiency or turnover of the firm -** The ratios are helpful in measuring the operating efficiency or the turnover of the firm. These ratios indicate the efficiency in utilizing the assets of the firm such as fixed assets turnover ratio, total resources turnover ratio etc.

4. **To assess the profitability position of the firm -** The ratio are useful to assess and measure the profitability of the firm in respect of sales and the investments. These ratios are concerned about the over –all profitability of the firm.

5. **Inter - firm and intra – firm comparison -** Ratios not only reflect the financial position of a firm, but also serves as a tool for remedial actions. This is made possible only due to inter-firm comparison. This would demonstrate the relative position of the firm vis-à-vis its competitors. If there is any variance in the ratios either with the industry average or with, those of competitors, the firm has to identify the reasons and would take remedial measures.

6. **Trend Analysis -** The trend analysis of ratios of a firm indicates whether the financial position of a firm is improving or deteriorating over the years. The significance of a trend analysis of ratio lies in the fact that the analyst can know the direction of movement whether the movement is favourable or unfavourable.

Thus, ratio analysis is considered better than a mere comparison of figures in carrying out an over – all appraisal of a company's business.

Management use of Ratio Analysis

Management in a company at all levels, top to middle and at operations level makes use of ratio analysis for evaluating their own achievements and making decisions appropriate to their levels. The following examples would illustrate the management use of ratio analysis:

1) Production Manager

Production Managers require data regarding output of the various divisions of the firm in a form that facilitates comparison both with production of the previous period and also with the results of the same period in the previous year. This data may be for a month, quarter or a week as per the requirement of analysis. Production at different levels may be related to number of employees, number of hours, the factory worker, production per hour per worker, production per unit of capital employed, and so on. Any decline in output or any enhancement in output can be ascribed to the cause which may be investigated for taking appropriate decision in each circumstance. The following are the import ratios:

   a) Ratios Relating to capacity utilization.

   b) Input and Output Ratios.

   c) Resource consumption Ratios

   d) Ratios relating to volume of production.

2) Sales Manager

Outlet of production is essential for an industrial unit. Sales managers can make good use of the ratio analysis for making sales decisions by comparing the past sales performance with the present sales and projecting a sales programme for the future. Sales Manager may locate changes in sales and related sales to income. Changes in sales may be observed by relating sales to total industry sales, sales per division to total sales of the firm, output to sales, and current sales to sales in previous period, and so on. Similarly, analysis can relate sales to selling expenses, sales to debtors, sales to assets etc. The following are the important ratios:

i) Expenses to sales ratio.

ii) Debtors to sales ratio

iii) Sales volume comparison ratios

3) Ratios used in hotel industry

The variety of ratios used by hotel industry which are:

1. Room Occupancy Ratio
2. Bed Occupancy Ratio
3. Double Occupancy Ratio
4. Seat Occupancy Ratios etc.

4) Ratios used in transport industry

The following important ratios are used in transport industry.

1. Passenger Kilometers
2. Seat occupancy Ratios
3. Operating cost per kilometer

5) Bank Industry

The following important ratios are used in Bank Industry.

1. Operating expenses ratios for various periods
2. Loans to deposits ratios
3. Operating income ratios for various periods

6) Financial Manager

Financial Manager is more concerned with supervision of a company's financing on a current basis as distinct from over all management. His concern at this stage is much more with the analysis of current payments to current income, financial ratios, cost flow data etc., for making future predictions of financial requirements and laying needs for credit facilities to be availed of from the money or capital market. The following important ratios used by Financial Manager :

1. Over all return on investment

2. Return on total resources

3. Capital turnover ratio

4. Working capital turnover ratio etc.

7) Executive Manager or General Manager

At this level of management the main concern is to oversee the entire management of the company and view the relative position of marketing or sales, production, finance, inventory position, personnel planning etc. The executive manager or/and general manager has to take strategic decisions and that is possible by studying the relative position of performance in all directions through the ratio analysis of past and present performance and on future projections.

8) Investor use of Ratio Analysis

Investors in a company mean the shareholder. Creditors are to be differentiated with investors. The interests of the two are a contradiction. Shareholders' major interest in the company is not the day-to-day management of its affairs but in the net result of its functioning in terms of profitability and reduction of the degree of risk.

Ratios used by investors may be divided into three main forms viz.

1) Profitability Ratios

2) Risk Ratios; and

3) Market performance of shares owned by shareholders

1) Profitability Ratios - Shareholders are interested in the profits earned by the company as well as the profits accrued on their own investment. Profitability ratios which are of interest to shareholders can be divided into following :

a) Profitability of total investment i.e., gross profits earned on total funds invested in the company irrespective of the capital structure.

b) Profits as percentage of sales i.e., profits earned from normal business activity. This indicates shareholders proportion of profits earned from normal business.

c) Profits after payment of interest as a ratio of shareholders equity. This indicates the actual earnings per share for investors.

d) Dividend per share or dividend as a percentage of profits. Dividend ratio can be computed to develop a trend over a number of years.

All the above sets of ratios can be compared to the performance of the company in the previous period – quarterly, half-yearly or annually – or with other firms in the same industry.

2) Risk Ratios - Investors while making investment in a company undertake i) Risk of capital loss due to decline in share price which may be due to lower profitability of the company or on account of general economic depression; ii) Risk of bankruptcy of the company and iii) Risk

of non-payment of dividend causing suffering to investors. Ratio analysis serves as indicator of the impending risk to shareholders who would appraise company's performance monthly, quarterly or annually. Dividend coverage ratio issued for this purpose. Dividend coverage ratio is given by = Profit after tax ÷ No. of Equity Shares.

3) Share Performance - Shareholders main concern remains the market performance of the shares with the role objective of capital gains realization. Earnings per share and market price per share can be compared for over the years for inter-firm comparison of the performance in an industry.

9) Creditor use of Ratio Analysis

Creditors frequently make use of ratio analysis to assess the company's financial position and standing. These creditors include financial Institutions, banks, debenture holders, as well as investment institutions. The main concern of the creditors is in assessing company's financial position with reference to its capacity to repay the loan and service the interest charges. Where creditors exert conversion rights they remain interested in the capital gains like ordinary shareholders through appreciation in market price for share as well as enhanced dividend rate through earnings per share.

LIMITATIONS OF ACCOUNTING RATIOS:

Accounting ratios are subject to certain limitations. They are given below:

Comparative study required - Ratios are useful in judging the efficiency of the business only when they are compared with the past results of the business or with the results of a similar business. However, such a comparison only provides a glimpse of the past performance and forecasts for future may not be correct since several other factors like market conditions, management policies, etc., may affect the future operations.

Limitations of financial statements - Ratios are based only on the information which has been recorded in the financial statements. As indicated in the preceding chapter financial statements suffer from a number of limitations, the ratios derived there from, are also subject to those limitations. For example, non-financial statements. If the management of the company changes, it may have ultimately adverse effects on the future profitability of the company but this cannot be judged by having a glance at the financial statements of the company.

Similarly, the management has a choice about the accounting policies. Different accounting policies may be adopted by management of different companies regarding valuation of inventories, depreciation, research and development expenditure and treatment of deferred revenue expenditure, etc. The comparison of one firm with another on the basis of ratio analsyis without taking into account the fact of companies having different accounting policies, will be misleading and meaningless. Moreover, the management of the firm itself may change its accounting policies from one period to another. It is, therefore, absolutely necessary that financial statements are themselves subjected to close scrutiny before an analysis is attempted on the basis of accounting ratios. The financial analyst must carefully examine the financial statements and make necessary adjustments in the financial statements on the basis of disclosure made regarding the accounting policies before undertaking financial analysis.

The growing realization among accountants all over the world, that the accounting policies should be standardized, has resulted in the establishment of International Accounting Standards Committee which has issued a number of International Accounting Standards. In our country, the Institute of Chartered Accountants of India has established Accounting Standards Board for formulation of requisite accounting standards. The Accounting Standards Board has already issued fifteen standards including AS – 1: Disclosure of Accounting Policies. The standard AS – 1 has been made mandatory in respect of accounts beginning on or after 1.4.1991. It is hoped that in the years to come, with the progressive standardization of accounting policies, this problem will be solved to a great extent.

Ratios alone are not adequate - Ratios are only indicators, they cannot be taken as final regarding good or bad financial position of the business. Other things have also to be seen. For example, a high current ratio does not necessarily mean that the concern has a good liquid position in case current assets mostly comprise outdated stocks. It has been correctly observed, "Ratios must be used for what they are – financial tools. Too often they are looked upon as ends in themselves rather than as a means to an end. The value of a ratio should not be regarded as good or bad inter se. It may be an indication that a firm is weak or strong in a particular area but it must never be taken as proof." "Ratios may be linked to railroads. They tell the analyst, stop, look and listen."

Window dressing - The term window dressing means manipulation of accounts in a way so as to conceal vital facts and present the financial statements in a way to show a better position than what it actually is. On account of such a situation, presence of a particular ratio may not be a definite indicator of good or bad management. For example, a high stock turnover ratio is generally considered to be an indication of operational efficiency of the business. But this might have been achieved by unwarranted price reductions or failure to maintain proper stock of goods.

Similarly, the current ratio may be improved just before the Balance Sheet date by postponing replenishment of inventory. For example, if a company has got current assets of Rs. 4,000 and current liabilities of Rs, 2,000 the current ratio is 2, which is quite satisfactory. In case the company purchases goods of Rs. 2,000 on credit, the current assets would go up to Rs. 6,000 and current liabilities to Rs. 4,000. Thus reducing the current ratio to 1.5. The company may, therefore, postpone the purchases for the early next year so that its current ratio continues to remain at 2 on the Balance Sheet date. Similarly, in order to improve the current ratio, the company may pay off certain pressing current liabilities before the Balance Sheet date. For example, if in the above case the company pays current liabilities of Rs. 1,000, the current liabilities would stand reduced to Rs. 1,000, current assets would stand reduced to Rs. 3,000 but the current ratio would go up to 3.

Problems of price level changes - Financial analysis based on accounting ratio will give misleading results if the effects of changes in price level are not taken into account. For example, two companies set up in different years, having plant and machinery of different ages, cannot be compared, on the basis of traditional accounting statements. This is because the depreciation charged on plant and machinery in case of old company would be at a much lower figure as compared to the company which has been set up recently. The financial statements of the companies should, therefore, be adjusted keeping in view the price level changes if a meaningful comparison is to be made through accounting ratios. The techniques of current purchasing power and current cost accounting are quite helpful in this respect.

No fixed Standards - No fixed standards can be laid down for ideal ratios. For example, current raio is generally considered to be ideal if current assets are twice the current liabilities. However, in case of those concerns which have adequate arrangements with their bankers for providing funds when they require, it may be perfectly ideal if current assets are equal to slightly more than current liabilities.

It is, therefore, necessary to avoid many rules of thumb. Financial analysis is an individual matter and value for a ratio which is perfectly acceptable for one company or one industry may not be at all acceptable in case of another.

Ratios are a composite of many figures - Ratio are a composite of many different figures. Some cover a time period, others are at an instant of time while still others are only averages. It has been said that "a man who has his head in the oven and his feet in the ice-box is on the average, comfortable" Many of the figures used in the ratio analysis are no more meaningful than the average temperature of the room in which this man sits. A balance sheet figure shows the balance of the account at one moment of one day. It certainly may not be representative of typical balance during the year.

It may, therefore, be concluded that ratio analysis, if done mechanically, is not only misleading but also dangerous. It is indeed a double edged sword which requires a great deal of understanding and sensitivity of the management process rather than mechanical financial skill. It has rightly been observed: "The ratio analysis is an aid to management in taking correct decisions, but as a mechanical substitute for thinking and judgment, it is worse than useless. The ratios if discriminately calculated and wisely interpreted can be a useful tool of financial analysis.

DUPONT CONTROL CHART:

DU PONT Analysis - Return on Investment (ROI) is one of the most important techniques ever conceived to aid the management both in decision making and performance evaluation. The DU PONT company of the United States pioneered this system of financial analysis which has received wide spread recognition and acceptance. This technique was developed by the DU PONT company for analyzing and controlling financial performance. The analysis considers important inter relationships based on information available in financial statements. The system of analysis brings together the net profit margin (NPM) and the total assets turn over ratio (TATR) and shows how these ratios interact to determine profitability of assets. Thus, the Return on Total Assets (ROTA) or Return on Investment (ROI) is defined as the product of the net profit margin and the total assets turnover ratio.

Symbolically, it can be expressed as follows:

Return on Investments (ROI) or Return On Total Assets (ROTA) = $\left[\dfrac{\text{Net profit}}{\text{Sales}} \times \dfrac{\text{Sales}}{\text{Total Assets}} \right]$

= ROI = [Net Profit Margin × Total Assets Turnover Ratio]

The analysis helps in understanding how the net return on Investments is influenced by the net profit margin and the total assets turnover ratio.

The relation ship between the Return on Investment and the net profit margin and total assets turnover is explained in detail in the following chart. This chart is developed by the DU PONT Company. Hence, it is known as DU PONT chart or DU PONT Analysis.
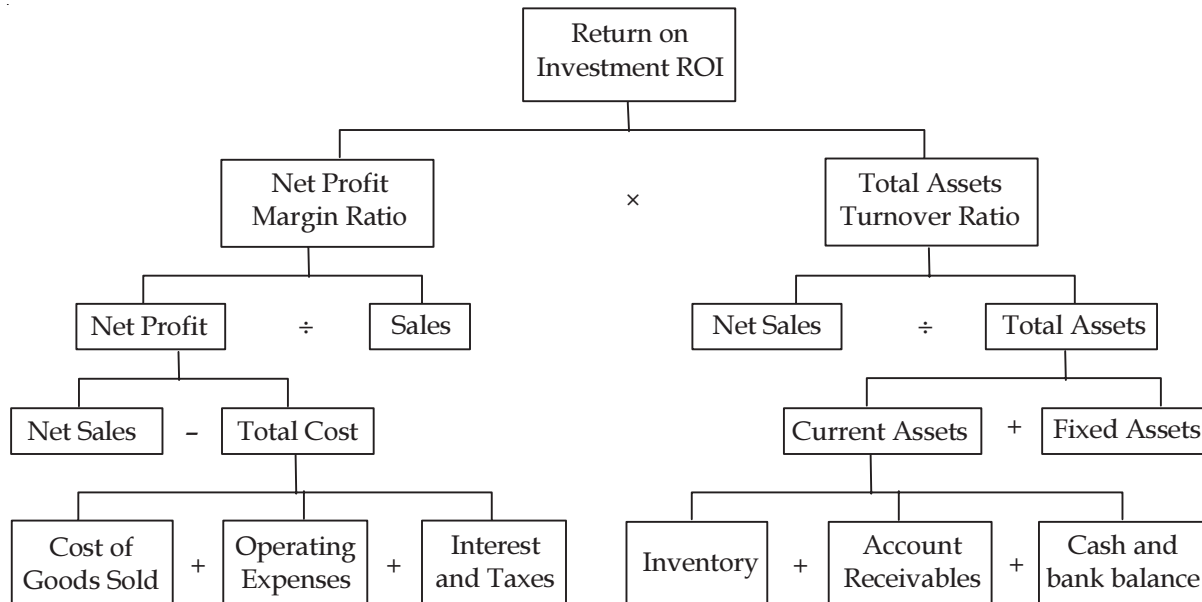
At the top of the DU PONT chart is the Return on Investments. The left hand side of the chart shows the details of net profit margin. Net profit margin is determined as net profit divided by sales. Net income is arrived at by deducting total cost i.e. (cost of goods sold plus operating expenses, Interest and Taxes) from net sales. Thus, the analysis indicates certain areas where cost reductions may be effected to improve the net profit margin and where cost control efforts should be directed.

The right hand side of the chart focuses on the total assets turnover ratio. The ratio is calculated as sales divided by total assets. Total assets are a composition of fixed assets and current assets (i.e., cash, bank, marketable securities, inventories, receivables or Debtors and others). If the total assets turnover is supplemented by a study of other turnover ratios, like Inventory, debtors, cash and fixed assets turnover ratios, a deeper insight can be gained into efficiencies or inefficiencies of asset utilization. The basic DU PONT analysis may also be extended to expose the determinants of the return on equity.

In order to make the analysis more meaningful the Return on Investment of the company must be compared with industry averages and with the company's own return on Investments of the previous years. The DUPONT analysis provides relevant clues to deficiency in asset management or lack of cost control or both, where the company's return on Investment is below the industry average. Further a detailed comparison of return on Investment of the company over the past few years reveals a declining tendency, it focuses attention of the management loosing control over expenses and inefficiently of assets management. At this

point of time, DU PONT analysis calls for prompt corrective action before the situation goes out of control.

DIFFICULTIES IN DU PONT ANALYSIS - Despite of the basic simplicity of the return on – investment concept, it suffers from some difficulties in respect of its computation and use.

1) Valuation of assets **-** The first and important limitation of the analysis is the selection and valuation of the assets comprising the investment base. In the analysis the gross value of the assets are considered and no deduction is made for depreciation. Moreover, the time value of money and price level changes are not considered while computing the return on Investments of the concern.

2) Delegation of responsibility **-** Another serious problem of the concept of Return of Investment is delegation of responsibility. The management has to delegate the authority with responsibility to some responsible level of management for collection of costs and revenues so as to accomplish the targeted level of Return on Investment otherwise, the whole exercise is infertile.

- Du-Pont Chart was developed by the USA based company Du-Point.
- This chart is a chart of financial ratio, which analyses the Net Profit Margin in terms of asset turn out.
- This chart shows that the ROI is ascertained as a product of Net profit margin ratio and investment turnover ratio
- There are three components in the calculation of return on equity using the traditional Du Pont model-the net profit margin, asset turnover, and the equity multiplier. By examining each input individual, the sources of a company's return on equity can be discovered and compared to its competitors.

Return of Equity = (Net Profit Margin) (Asset Turnover) (Equity Multiplier)
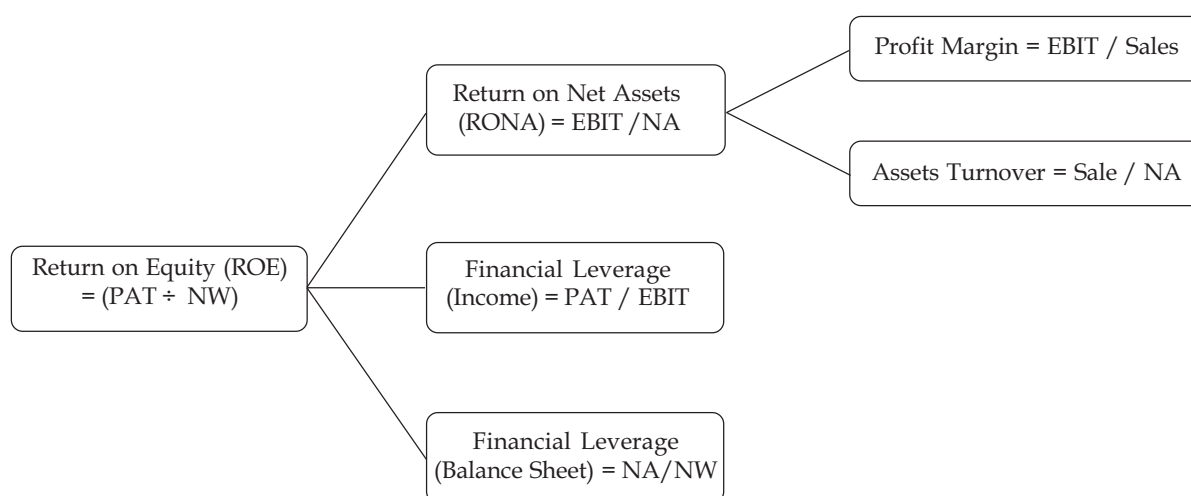
3.3 Identification of Information required to access Financial Performance

This section includes :

- **Information required to access financial performance**
  - **Historical Financial Statements**
  - **Forecasted Financial Statements**

INTRODUCTION :

There are several techniques and statements used to evaluate the financial performance of an enterprise. The basis for financial planning analysis and decision making is the financial information. Information is needed to forecast, compare & evaluate the earning capacity of the firm. The financial information of and organisation is contained in the financial statements. There are basically two types of statements, which are used in the preparation of financial statements. They are:

1. **HISTORICAL FINANCIAL STATEMENTS**
2. **FORECASTING FINANCIAL STATEMENTS**

   1. HISTORICAL FINANCIAL STATEMENTS:

   - Balance Sheet
   - Income Statement
   - Comparative Balance Sheet
   - Common-size statements
   - Statement showing changes in working capital
   - Statement indicating changes in owner's equity
   - Statement showing variations in net income
   - Statement showing variations in gross income
   - Funds Flow Statement
   - Auditors Report
   - Corporate Annual Report
   - Ratios

Balance Sheet

A balance sheet is the basic financial statement. It presents data on a company's financial conditions on a particular date, based on conventions and generally accepted principles of accounting. The amount shown in the statements on the balances, at the time it was prepared in the various accounts listed in the company's accounting records, is considered to be a fundamental accounting statements. The income statement summarises the business operations during the specific period and shows the results of such operations in the form of net in come or net loss. By comparing the income statements of successive periods, it is possible

to determine the progress of a business. A statement is supplemented by a comparative statement of the cost of goods manufactured and sold. It is prepared at regular intervals and shows what a business enterprise owns and what it owes. It provides information which helps in the assessment of the three main aspects of an enterprises position – its profitability , liquidity and solvency. Of these, the later two are concerned with an enterprises ability to meet its liabilities , while profitability is most useful overall measure of its financial conditions, the balance sheet is a statements of assets, liabilities capital on specified date. It is therefore a static statement, indicating resources and the allocation of these resources to various categories of asset. It is so to say financial photography finance. Liabilities show the claims against its assets. The shareholders equity comprises the total owner ship claims in a firm. This claim includes net worth of shareholders equity and preferred stock. The traditional company balance sheet statement of assets valued on the basis of their original cost and the means by which they have been financed by its shareholders, lenders, suppliers and by the retention of income.

This tool suffers from the following limitations:

1. A balance sheet gives only a limited picture of state of affairs of a company, because it includes only those items which can be expressed in monetary terms.
2. The values shown on the balance sheet for some of the assets are never accurate
3. A balance sheet assumes that the real value of money remain constant.
4. On the basis of balance sheet, it is not possible to arrive at any conclusion about the success of an enterprise in the future.
5. It is a detailed statement of the financial structure of a business.

Income Statement

The results of operations of a business for a period of time are presented in the income statement. From the accounting point of view, an income statement is subordinate to the balance sheet because the former simply presents the details of the changes in the retained earnings in balance sheet accounts. However, if vital source of financial information an income statement summarises the results of business operations during specific period and shows in the form of net income or net loss by comparing income statements for successive periods, it is possible to observe the progress of the business the statement is supplemented by a comparative statement of cost of goods manufactured and sold. It summarises a firms operating results for the past period. While balance sheet is like a still photograph an income statement is like a moving picture. The final frame of this movie is the balance sheet. The main emphasis in financial reporting earlier was on the balance sheet as a statement of financial soundness and solvency of a business entity in one sense, despite its current importance of for investors and other interested parties, an income statement simply a more detail report on one particular aspects of balance sheet that is the retained income.

Comparative Balance Sheet

Financial statements are sometimes recast for facility of scrutiny. The effects of the conductor business are reflected in its balance sheet by changes in assets and liabilities and in its net worth. The comparative income statement presents a review of operating activities in business.

A comparative balance sheet shows effect of the operations on the assets and liabilities. The practice of presenting comprative statement in the annual report is now becoming wide spread because it is a connection between balance sheet and income statement. Considerations like price levels and accounting methods are given due weight at the time of comparison.

Common-size Statements

The percentage balance sheet is often known as the common size balance sheet. Such balance sheet are, in a broad sense ratio analysis general items in the profit and loss accounts and in the balance sheet are expressed in analytical percentages when expressed in the form, the balance sheet and profit and loss account are referred to as **a common size statement. Such statements are useful in comparative analysis of the** financial position in operating results of the business.

Statement showing changes in working capital

This statement was originally devised by M.A. Finney and is also known as statement of application of funds. The transactions affecting current assets and current liabilities bring about changes in working capital. The statement account for the difference between the working capital at the beginning and at the end of period. The object is to review the financial activities of a business which have caused changes in the current position. Since most of the financial transactions affect the working capital, a summary of the changes in it, is the valuable survey of significant financial events.

Statement indicating changes in owner's equity

An income statement cannot by itself be relied upon to present all the changes in the owner's equity during an accounting period because it relates only to profit oriented activities. To describe the changes due to capital additions and disbursements, additional statements and disclosure is required. Changes in retained earnings are presented in the 'statement of changes in retained earnings'. The statement of retained earnings link between the net income and in the changes in the retained earnings during a particular period.

Statements showing variations in net income

The statement is similar to that which accounts for the changes in capital. It may be re-arranged in a form which explains variations in net income. It is also necessary to explain the causes of variation such as changes in commodity, volume, cost, price, etc.

Statement showing variations in gross margin

This statement is prepared only when a single uniform commodity is sold or when separate figures are available for sales, cost of goods sold, units of commodity sold etc.

Marginal Income Statement

The marginal statement shows the income which contributes to the fixed expenses. The net income is, therefore, referred to as contribution. In the statement, expenses are classified as variable and fixed.

Fund Flow Statement

This is a slight modification of balance sheet. It is intended to portray the inflow and out flow of actual funds. The following adjustments are made:

- The elimination of accounting entries that do not represents the flow of funds;
- The connection of related items to present more coherent results ;
- The addition of distributed profits ;

Fund flow statements present a company's source and uses of funds during an accounting period. They are often required to be including in the balance sheet and income statement in the annual financial reports. The causes of the changes in the firm's financial position can be readily observed in a well prepared fund flow statement.

Cash Flow Statement

A cash flow statement is the financial analysis of the net income or profit after including book expense items which currently do not use cash; for example, depreciation, depletion and amortization. Revenue items, which do not currently provide funds, are to be deducted. A gross cash flow is net profit after tax plus provision for depreciation. A net cash flow is arrived at after deducting dividends from the gross cash flow. The cash flow is very significant because it represents the actual amount of cash available to the business.

Auditor's Report

Published financial statements are usually accompanied by signed auditor's report, who is morally bounded to exercise his independent judgment on the validity of the financial statements. The report is always read in conjunction with the financial statements.

Corporate Annual Report

Most annual reports include a company's activities, plans, and problems, both in quantitative and qualitative terms. Modern reports are not merely directed at the stock holders; they are prepared for the interested employees and the members of the public as well, and are a part of company's public relations programme. They contain not only financial statements and other statistics and but also matters related to its activities, and often precisely illustrated in colour.

Statutory Statement

There are certain forms of financial statements which are statutorily required by the securities and the exchange commission. This statement, too, should be certified by the auditors.

Retained Earnings Statement

It summarises the changes in Retained earnings from the figure shown in the previous year balance sheet.

Audited Statement

It covers a specific period, generally the financial year, and is prepared by certified public accountants. It is ordinary reliable statement. The auditor may express his opinion in the statement. The analyst should read the opinion carefully to determine the extent of the reliability of the figures appearing in the statement.

Interim Statement

An interim statement is prepared for a period which may be a month, a quarter or six months. It is not subject to audit. It may be helpful to the businessman who is interested in periodically evaluating performance, and wants to find out the extent to which executives adhere to Budgets and forecasts and uncover any problems that may arise from them.

RATIOS:

Ratio indicates the quantitative relationship between two variables. There are several ratios, which are used to analyse the financial performance of an enterprise. They are:

1. Profitability Ratios

2. Turnover Ratios

3. Financial Ratios and

4. Miscellaneous Ratios

2. FORECASTING FINANCIAL STATEMENTS :

There are several forecasted financial statements which are used to analyse the financial performance. These are:

- Forecasted Balance Sheet
- Budgets
- Forecasting Capital Expenditure
- Forecasting Future Incomes and Expenditures
- Forecasting Cost of Production
- Forecasting Level of Activity
- Forecasting Variation Statements

PROBLEMS AND SOLUTIONS

Illustration 1

Following is the Profit and Loss Account and Balance Sheet of Jai Hind Ltd. Redraft them for the purpose of analysis and calculate the following ratios:

1) Gross Profit Ratio
2) Overall Profitability Ratio
3) Current Ratio
4) Debt-Equity Ratio
5) Stock-Turnover Ratio
6) Finished goods Turnover Ratio
7) Liquidity ratio

Profit and Loss A/C

Dr.			Cr.
Opening stock of finished goods	1,00,000	Sales	10,00,000
Opening stock of raw material	50,000	Closing stock of raw material	1,50,000
Purchase of raw material	3,00,000	Closing stock of finished goods	1,00,000
Direct wages	2,00,000	Profit on sale of shares	50,000
Manufacturing Exp	1,00,000		
Administration Exp	50,000		
Selling & distribution Exp	50,000		
Loss on sale of Plant	55,000		
Interest on debentures	10,000		
Net Profit	3,85,000		
	13,00,000		**13,00,000**

Balance Sheet

Liabilities	Rs	Assets	Rs
Equity share capital	1,00,000	Fixed assets	2,50,000
Preference share capital	1,00,000	Stock of raw material	1,50,000
Reserves	1,00,000	Stock of finished goods	1,00,000
Debentures	2,00,000	Bank balance	50,000
Sundry Creditors	1,00,000	Debtors	1,00,000
Bills Payable	50,000		
	6,50,000		**6,50,000**

Solution :

INCOME STATEMENT

Sales		1000000
(-) Cost of goods:		
Raw material consumed	2,00,000	
Wages	2,00,000	
Manufacturing expenses	1,00,000	
Cost of production	5,00,000	
(+) opening stock	1,00,000	
(-) closing stock	(1,00,000)	(5,00,000)
Gross profit		5,00,000
(-) operating expenses:		
Administrative expenses	50,000	
Selling and distribution	50,000	(1,00,000)
Operating profit		4,00,000
(+) non operating income		50,000
(-) loss on sale of plant		(55,000)
EBIT		3,95,000
(-) interest		(10,000)
EBT / Net Profit		3,85,000

POSITION STATEMENT

Bank	50,000
Debtors	1,00,000
Liquid assets	1,50,000
(+) stock	2,50,000
Current assets	4,00,000
(-) current liabilities	(1,50,000)
Working capital	2,50,000
(+) fixed assets	2,50,000
Capital employed in business	5,00,000
(-) external liabilities	(2,00,000)
Share holders funds	3,00,000
(-) preference share capital	(1,00,000)
Equity share capital	2,00,000

It is represented by

Equity share capital 1,00,000

(+) reserves $\underline{1,00,000}$

2,00,000

1) Gross Profit Ratio $= \dfrac{\text{Gross Profit}}{\text{Sales}} \times 100$

$= \dfrac{5,00,000}{10,00,000} \times 100 = 50\%$

2) Overall Profitability Ratio $= \dfrac{\text{Operating Profit}}{\text{Capital employed}} \times 100$

$= \dfrac{4,00,000}{5,00,000} \times 100 = 80\%$

3) Current Ratio $= \dfrac{\text{Current Assets}}{\text{Current Liabilities}} \times 100$

Current Ratio $= \dfrac{4,00,000}{1,50,000} \times 100 = 2.67$ times

4) Debt Equity Ratio $= \dfrac{\text{Long term debt}}{\text{Long term fund}} \times 100$

Debt Equity Ratio $= \dfrac{2,00,000}{5,00,000} = 0.4$

5) Stock turnover Ratio $= \dfrac{\text{Raw material consumed}}{\text{Average stock of raw material}}$

Stock turnover Ratio $= \dfrac{2,00,000}{1,00,000} = 2$

6) Finished goods turnover Ratio $= \dfrac{\text{COGS}}{\text{Average Stock}}$

Finished goods turnover Ratio $= \dfrac{5,00,000}{1,00,000} = 5$

7) $\text{Liquidity Ratio} = \dfrac{\text{Liquid Assets}}{\text{Current Liabilities}}$

$\text{Liquidity Ratio} = \dfrac{1{,}50{,}000}{1{,}50{,}000} = 1$

Illustration 2

A company has a profit margin of 20% and asset turnover of 3 times. What is the company's return on investment? How will this return on investment vary if :

i.   Profit margin is increased by 5%?

ii.   Asset turnover is decreased to 2 times?

iii.   Profit margin is decreased by 5% and asset turnover is increase to 4 times?

Solution :

Net profit ratio   = 20% (given)

Assets turnover ratio = 3 times (given)

Return on Investment (ROI) = Net Profit ratio x Assets turnover ratio

= 20% x 3 times = 60%

i. If net profit ratio is increased by 5 %:

Then Revised Net Profit Ratio = 20 + 5 = 25%

Asset Turnover Ratio (as before) = 3 times

∴ ROI = 25 % x 3 times = 75%

ii. If assets turnover ratio is decreased to 2 times:

NP Ratio (as before) = 20%

Revised Asset Turnover Ratio = 2 times

∴ ROI = 20% x 2 times = 40 %

iii. If net profit ratio falls by 5% and assets turnover ratio raises to 4 times:

Then Revised NP Ratio = 20 – 5 = 15%

Revised Asset Turnover Ratio = 4 times

∴ ROI = 15% x 4 = 60%

Illustration 3

The following is the balance sheet of M/S Yamuna Enterprise for the year ended 31-12-08:

Balance Sheet as on 31ˢᵗ December, 2008

Liabilities	Rs	Assets	Rs
Equity share capital	1,00,000	Cash in hand	2,000
12% Preference share capital	1,00,000	Cash in bank	10,000
16% Debentures	40,000	Bills Receivable	30,000
18% Public debts	20,000	Investors	20,000
Bank overdraft	40,000	Debtors	70,000
Creditors	60,000	Stock	40,000
Outstanding Creditors	7,000	Furniture	30,000
Proposed dividends	10,000	Machinery	1,00,000
Reserves	1,50,000	Land & Building	2,20,000
Provision for taxation	20,000	Goodwill	35,000
Profit & loss account	20,000	Preliminary expenses	10,000
	5,67,000		5,67,000

During the year provision for taxation was Rs. 20,000. Dividend was proposed at Rs. 10,000. Profit carried forward from the last year was Rs. 15,000. You are required to calculate:

    a) Short term solvency ratios, and

    b) Long term solvency ratios.

Solution

Short term solvency ratios :

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

$$= \frac{1,52,000}{1,37,000} = 1.109 \text{ times}$$

The ideal ratio is 2 but in the instant case it is only 1.109. hence it is not satisfactory.

$$\text{Liquid Ratio} = \frac{\text{Liquid Assets}}{\text{Current Liabilities}} = \frac{1,12,000}{1,37,000} = 0.818$$

The ideal ratio is 1; hence it is not quite satisfactory.

$$\text{Interest Coverage Ratio} = \frac{\text{EBIT}}{\text{Interest}}$$

$$= \frac{45,000}{10,000} = 4.5 \text{ times}$$

	EBIT
Profit retained	5000
(+) proposed dividend	10000
PAT	15000
(+) tax	20000
PBT	35000
(+) interest [6400 + 3600]	10000
EBIT	**45000**

Long term solvency ratios :

$$\text{Debt equity Ratio} = \frac{\text{Long term debt}}{\text{Long term fund}}$$

$$= \frac{60,000}{3,85,000} = 0.156$$

Long term debt :

Debentures	40000
Public debt	20000
	60000

Share holder funds :

Equity capital	100000
Preference capital	100000
Reserves	150000
P & L a/c	20000
(-) good will	35000
(-) Preliminary exp	10000
	325000

(2) Long term debt/ share holders funds = 60000 / 325000 = 0.18

Both are quite satisfactory.

It seems the company has adopted a conservative policy for raising Finance. Under such policy the equity share holders may not avail the benefit of trading on equity.

Fixed assets ratio = fixed assets / long term funds = 350000 / 385000 = 0.91

The ratio is satisfactory.

Proprietary ratio = share holder funds / total tangible assets

= [325000 / (567000 – 45000)] = 0.6226

Ratio is ideal. And long term position is quite satisfactory, it is advised to improve short term solvency.

Illustration 4

Given the following information for ABC Company at the end of 2009. Determine balances for the income statement and the balance sheet.

Net sales	Rs. 1,00,000
Debt-assets ratio	0.6
debtor's turnover ratio based on net sales	2
Net profit margin	5%
Gross profit margin	25%
Inventory turnover ratio	1.25
Return on Total resources	2%
Fixed assets turnover ratio (on sales)	0.8

Particulars of Income statement for the year ending on 31st March 2009.

Sales	Rs. 1,00,000	Earnings before tax	Rs. — —
Cost of goods sold	— — —	Taxes @ 50%	— — —
Gross profit	— — —	Earnings after tax	— — —
Other expenses			— — —

Balance Sheet as on 31st March 2009.

Liabilities	Rs.	Assets	Rs.
Equity	— — —	Net fixed assets	— — —
Long-term debt	— — —	Inventory	— — —
Short-term debt	50,000	Debtors	— — —
		Cash	————
Total:	————	Total:	————

Solution :

Sales	100000
(-) gross profit (25%)	25000
	75000

Debtors turnover ratio = 2 times
Debtors = 100000 / 2
        = 50000
Net profit (5%) = 5000
Stock turnover ratio = COGS / closing stock = 1.25
Closing stock   = 75000 / 1.25
             = 60000
Return on total resources = Net Profit / Total Assets = 2%
Total assets   = 5000 / 2% = 250000
Fixed assets ratio   = sales / fixed assets = 0.8
Fixed assets   = 100000 / 0.8
                = 125000
Debt assets ratio   = total debt / total assets = 0.6
Total debt   = 250000 x 0.6
                = 150000
Long term debt   = 150000 – 50000 (short term debt given) = 100000

Income statement:

Sales	100000
(-) cost of sales	75000
Gross profit	25000
(-)expenses	15000
EBT	10000
(-) Tax @ 50%	5000
Net profit	5000

Balance sheet

Liabilities	Rs	Assets	Rs
Equity share capital	100000	Fixed assets	125000
Long term debt	100000	Stock	60000
short term debt	50000	Debtors	50000
		Cash	15000
	250000		**250000**

Du Pont Control Chart

a) ROI = NP Ratio X Capital turnover Ratio

ROI

↓ ↓

NP Ratio   Capital Turnover Ratio

↓ ↓

Net Profit / Sales   Sales / Capital Employed

Net Profit = Sales – Expenses   Capital Employed = F.A + W.C

↓

W.C = Current Assets – Current Liabilities

Cost of Goods Sold	Operating Expenses	Tax	Stock Debtors	Bills Payable Creditors

Cash
Bills Receivable

↓

Op.Stock + Purchases +
Manufacturing Exp – Closing Stock
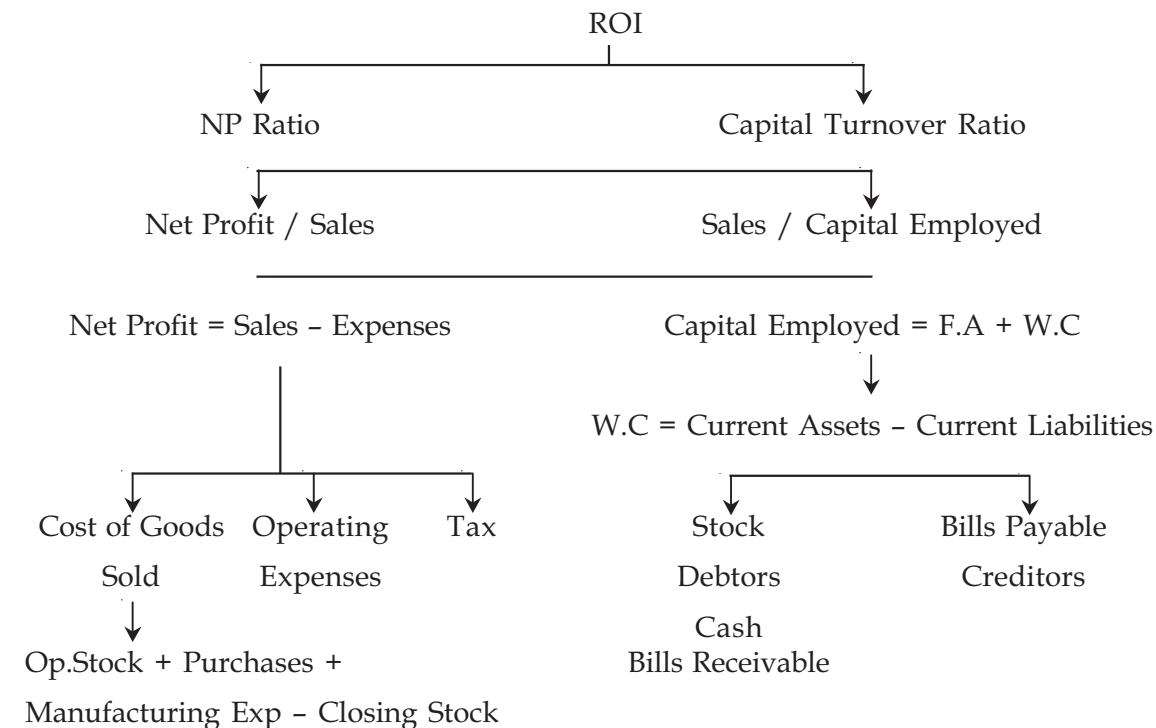
b) ROI = NP Ratio X Assets turnover Ratio
(Return on Total Resources)

ROI

↓ ↓

NP Ratio (5%)   Assets Turnover Ratio (0.4)

↓ ↓

NP / Sales   Sales / Total Assets

Sales	1,00,000	Sales		Total Assets
(-) Expenses		1,00,000		2,50,000
COGS	75,000		Fixed Assets	1,25,000
Operating exp	15,000		Debtors	50,000
Tax	5,000		Stock	60,000
Net Profit	5,000		Cash	15,000
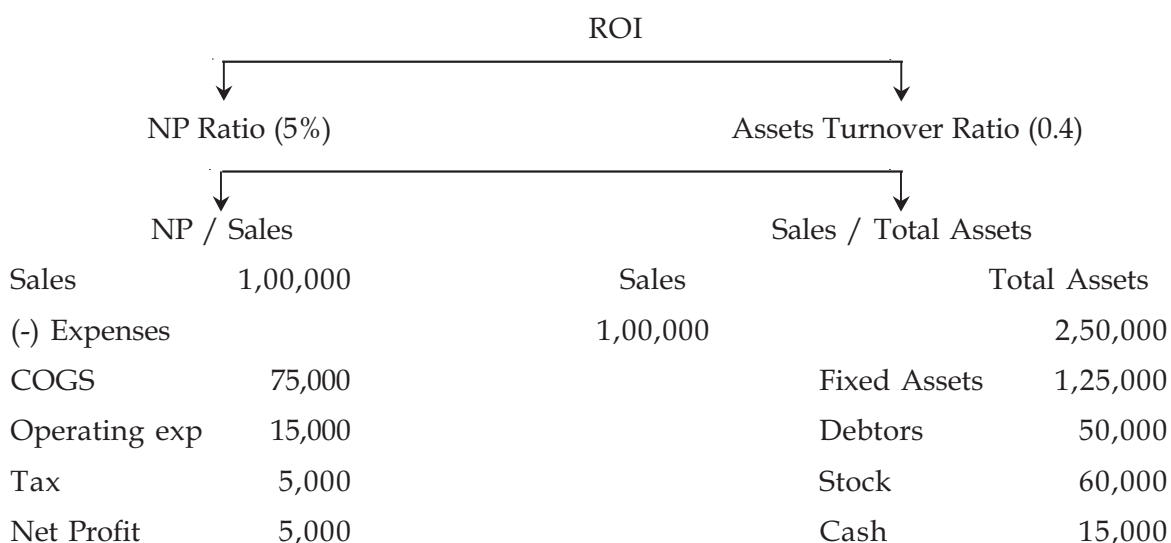
c) ROE = PAT / Equity

(Return on Equity) = NP Ratio x Assets Turnover Ratio x Equity Multiplier

ROE

NP Ratio	Equity Multiplier	Assets Turnover Ratio
NP / Sales	Assets / Equity	Sales / Total Assets
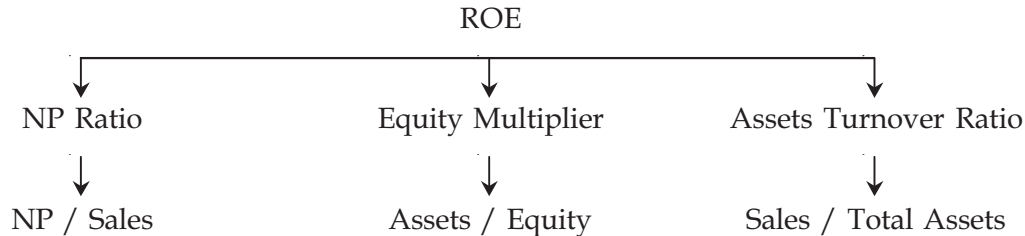
Illustration 5

Ashwin Ltd. commenced manufacture of Scooters on 1.4.08 with a paid-up Capital of Rs.100 lakhs. The company had obtained a licence to manufacture 2,000 vehicles per annum. For the year ended 31.3.2009 the company produced 1,500 vehicles and sold 1,250 vehicles at a price of Rs.24,000 per vehicle. The operating statements of the company revealed the following information and ratios.

Information:

Capital: The Company raised an additional capital of Rs.50 lakhs on 1.2.09.

Dividend: The Company paid an interim dividend at 10%on 31.10.08. A further dividend of 10% was provided out of the profits on 31.3.09. No dividend was payable on the additional capital raised.

Loan: A long-term loan of Rs.100 lakhs at 20% rate of interest was obtained on 1.4.08. This loan is to be paid in five annual equal instalments. The company paid the interest as well as the first instalment of Rs.20 lakhs on 31.3.09.

Cash Balance: The cash on hand and at bank on 31.3.09 was Rs.6 lakhs.

Investment: The Company invested a sum of Rs. 100 lakhs in Govt. Bonds on 1.6.08, carrying an interest of 12%. The interest was received at the end of every month. All moneys were duly received.

Cost of Production: Cost of production consisted of Raw materials, Direct labour, Manufacturing overheads and Depreciation. Direct labour was 35% of the production cost.

Total Assets: The total assets (Net fixed assets Investment and Current assets) of the company as on 31.3.09 equaled the Sales Turnover of the year.

Finished Goods: The finished goods were valued on the basis of the full production cost.

Ratios:

Current Ratio	2
Debtor's turnover	6 times
Creditors turnover	6 times
Interest coverage ratio	4 times
Debt service coverage ratio	1.75 times
Profit after tax	10% of sales turnover
Raw materials turnover (Based on closing stock)	4 times

You are required to :

Prepare the Profit & Loss Account for the year ended 31.3.09 and the Balance Sheet as on that date.

Note: 1) Indicate your figures in lakhs. (2) All working notes must form part of your answer.

Solution

Working notes:

1.	Capital	10000000	
	(+) Additional capital	5000000	
		15000000	
2.	Production	1500 units	
	(-) Sales	1250 units	
	Closing stock of finished goods	250 units	
3.	Sales (1250@24000)	30000000	
4.	Dividend paid (10000000 @ 10 %)	1000000	
	Dividend proposed	1000000	
	Total dividend	2000000	
5.	Loan	10000000	
	Installment	2000000	
	Out standing loan	8000000	
	Interest paid	2000000	
6.	Cash balance	600000	
7.	Interest on government bonds	1000000	
	(10000000 x 12 %x 10 / 12)		
	Investment to be shown in balance sheet	10000000	
8.	Cost of production (1500 units)		
	Raw materials (WN 15)	9600000	
	Labour @ 35 %	8400000	
	Manufacturing overheads (b/f)	4000000	
	Depreciation	2000000	
		24000000	

9. Total assets = Sales => 30000000

   Total liability = 30000000

10. Debtors = (Sales / Debtors turnover ratio) = 5000000

11. Interest coverage ratio = (EBIT / Interest)

    4 = (EBIT / 2000000) => EBIT = 8000000

12.

EBIT	8000000
(-) Interest	2000000
PBT	6000000
(-) provision for tax (b/f)	3000000
PAT	3000000
(-) Dividend	2000000
Profits retained	1000000

13. Debt service coverage ratio

    1.75 = (PAT + Interest + depreciation / Interest + Principal)

    1.75 = (3000000 + 2000000 + depreciation / 2000000 + 2000000)

    Depreciation = 2000000

14. Creditors turnover ratio = (credit purchases / creditors)

    Purchases = 12000000

15. R.material turnover ratio = (R.material consumed / closing stock of R.material)

    4 = (purchases – closing stock) / closing stock

    Closing stock =   2400000

    Material consumed   9600000

Balance sheet

Liabilities		Rs	Assets		Rs
Capital		15000000	Fixed assets	10000000	
			(-) depreciation(b/f)	2000000	8000000
P & L A/c		1000000	Investments		10000000
Current liabilities		6000000	**Current assets**		
Tax	3000000		Debtors	5000000	
Dividend	1000000		Cash	600000	
Creditors (b/f)	2000000	8000000	Finished goods (b/f)	4000000	
			Raw material	2400000	12000000
		30000000			30000000

Income statement

Sales		30000000
Cost of goods sold:		
Cost of production	24000000	
(-) closing stock	4000000	20000000
Gross profit		10000000
(-)Operating expense (b/f)		3000000
Operating Income		7000000
(+)non operating income		1000000
EBIT (WN 11)		8000000

Illustration 6

Akash Limited commenced manufacturing personal computers on 1.4.2008 with an equity capital of Rs. 5,00,000 in shares of Rs. 10 each. The following details were gathered from the accounting records of the company for the year ended 31.3.2009.

Current Ratio	2
Sales to working capital	8 times
Sales to Net fixed assets	4 times
Credit sales	75%
Gross Profit ratio	30%
Net Profit ratio (after tax)	10%
Interest coverage ratio	5 times
Debtors turnover ratio	6 times
Stock turnover ratio (based on closing stock)	7 times
Long-term Debt/Equity ratio	1:2
Provision for income tax	$33\frac{1}{3}$ %
Proposed dividend (assume that it is not taxable)	20%
Investments as on 31.3.2009	Rs. 1,50,000

Selling and distribution expenses (50% was outstanding as on 31.3.2009) Rs. 1,00,000

Depreciation rate	20%

(Depreciation was not part of cost of goods sold)

You are required to prepare :

(i)   The profit and Loss statement for the year ended 31.3.2009;

(ii)   The Balance Sheet of the company as at that date.

Solution

Capital = 500000, proposed dividend = 100000

Let the sales be   x

(-) COGS $0.7x$

  Gross profit $0.3x$

(-) operating expenses:

Sundry expenses   100000

Depreciation $0.0625x$

Operating profit $0.2375x - 100000$

(-) interest (1/5) $0.0475x -$ 20000

PBT $0.19 x - 80000$

PAT (2/3) $2 / 3 (0.19x - 80000)$

=> 10% sales = $0.1x$

=> $0.19 x - 80000 = 3 / 2 (0.1x)$

=> $x = 2000000 = $ sales

Given, sales / working capital = 8

Working capital = 2000000 / 8 = 250000

Current assets / current liabilities = 2

current assets = 2 current liabilities

working capital = current Assets – current liabilities = 250000

current liabilities = 250000

current assets = 2 current liabilities = 500000

Net fixed assets = 2000000 / 4 = 500000

Sales	2000000
(-) cost of goods sold	(1400000)
Gross profit	600000
(-) operating expenses :	(125000)
DepreciationSundry expenses	(100000)
EBIT	375000
(-)Interest	(75000)
PBT	300000
(-) Tax@ (1/3)	(100000)
PAT	200000

(-) Proposed dividend   (100000)

Profit Retained   100000

Credit sales = 75% of Total Sales

          = 75% x 2000000 = 1500000

Debtors turnover ratio => debtors = credit sales / 6

= 1500000 / 6 = 250000

Stock turnover ratio   = COGS / Closing stock = 7

Closing stock   = 1400000 / 7 = 200000

Cash = 50000 (250000 - 200000)

Debt Equity ratio = 1 : 2

Share capital + current year profit = 600000

Debt = 300000

Balance Sheet

Liabilities	Rs	Assets	Rs
Capital	500000	Fixed assets	500000
Profit	100000	Current assets	500000
Debt	300000	Investments	150000
Current liabilities	250000		
	1150000		**1150000**

Illustration 7

Following is the Balance Sheet of D Company on March 31, 2008:

D Company – Balance Sheet as on 31st March, 2008

Liabilities	Rs	Assets		Rs
Equity Shares of Rs. 10 each	10,000	Fixed Assets	1,10,000	
Additional money received on shares	30,000	Accumulated depreciation	30,000	80,000
Retained earnings	13,250	Accounts receivable		3,000
Bonds	30,000	Inventories		11,000
Accounts payable	11,580	Prepaid expenses		230
		Cash		600
	94,830			**94,830**

The company did not buy or sell any fixed assets nor issued any shares during 2009. On March 31, 2009, the Company's Accountant obtained the following ratios and other data based on the 2009 operations:

Current ratio	2.0 times
Acid-test ratio	0.8 times
Turnover of average inventory	5.0 times
Turnover of average receivables	25.0 times
Equity ratio	58.8%
Debt ratio	41.2%
Times interest earned	6.0 times
Percentage of profit after tax on sales	7.0%
Gross margin percentage	52.0%
Book value per share	Rs. 58.80
Market value per share	Rs. 64.00
Earnings per share	Rs. 8.75
Dividend yield	5.0%
Corporate income Tax rate.	30%
Depreciation rate	4% on original cost

Required :

Use the above data to prepare the Company's Balance Sheet on March 31, 2009 and Income Statement for the year ending on March 31, 2009.

Solution :

Working notes :

➢ Book value per share = 58.80

   Equity = capital + reserves = 58.8 x 1000 = 58800

➢ Long term debt = 58,800 x 41.2 / 58.8 = 41,200

➢ Capital employed = 100000 [58800 + 41200]

➢ EPS = PAT / no of shares = 8.75

   PAT = 8.75 x 1000 = 8750 (i.e. 70% of PBT)

   Tax rate @ 30%

   PBT = 8750 x 100/70 = 12,500

   Sales = 8750 / 0.07 = 125000

   Gross profit = 65000 (i.e 52 % of sales)

   COGS = 60,000

➢ Interest coverage ratio = (PBT + Interest) / Interest = 6

        12500 + I = 6I

        Interest = 2500

➢ Turnover of average Inventory = 5

    (COGS / Average stock) = 5

    Average stock = 60000 / 5 = 12000

    (11000 + closing stock) / 2 = 12000

    Closing stock = 13000

➢ Turnover of average receivables = sales / average receivables = 25

    Average a/c receivables = 125000 / 25 = 5000

    (3000 + closing) / 2 = 5000

    Closing receivables = 7000

➢ Dividend Yield Ratio = Dividend per share/ market price

    = 0.05 = DPS / 64

    DPS = 3.20

    Total dividend paid = 3.20 x 1000 = 3,200

➢ Depreciation = 110000 x 4% = 4400

Income statement

Sales	125000
(-) COGS	60000
Gross profit	65000
(-) operating expenses	50000
Operating profit	15000
(-) Interest	2500
PBT	12500
(-) Provision for tax	3750
PAT	8750
(-) proposed dividend	3200
Profit retained	5550

Equity :

Capital		10000
Additional money		30000
Retained earnings	13250	
(+) current year	5550	18800
		58800

Balance sheet

Liabilities		Rs	Assets		Rs
Capital		10000	Fixed assets	110000	
			(-) depreciation	34400	75600
Additional capital		30000	Accounts receivable		7000
Retained profit		18800	Stock		13000
Bonds (debt)		41200	Prepaid expenses		16280
Accounts payable:			Cash		12520
Provision for tax	3750				
Proposed dividend	3200				
Creditors	17450	24400			
		124400			124400

➢ Capital Employed (Debt + Equity) = F.A + W.C

W.C = 1,00,000 – 75,600

= 24,400

➢ CA's – CL's = 24400

Given Current Assets = 2Current Liabilities

2 current liabilities – current liabilities = 24400

Current liabilities = 24400

Current assets = 2 x 24400

= 48800

➢ Liquid ratio = 0.8

Quick assets / current liabilities = 0.8

Quick assets = 24400 × 0.8 = 19520   [Accounts receivables + cash]

Cash = 12520

Illustration 8

Exe Limited is a dealer in automobile components. While preparing the financial statements for the year ended 31.3.2009, it was discovered that a substantial portion of the record was missing. However, the accountant was able to gather the following data:

	Rs	Rs		Rs.	Rs.
Share Capital			Fixed Assts		
Authorised and subscribed:			Land		1,20,000
20,000 equity shares of					
Rs.10 each, fully paid up		2,00,000	Plant and Machinery		
			at cost	?	
Reserves and Surplus			Less Depreciation	?	
General Reserve:			Current Assets		
Balance on 1.4.2000	60,000		Stock	?	
Add: Transfer during the year	?	?	Debtors	?	
Secured Loans 15% loan		?	Cash and Bank	?	?
Current liabilities					
Creditors	?				
Provision for tax	?				
Proposed Dividend	?	2,00,000			

The following additional information is provided to you:

Current ratio   2 Times

Cash and bank 30% of total current assets

Debtors velocity (Sales/Debtors)   12 times

Stock Velocity (Cost of goods sold/stock)   12 times

Creditors velocity (Cost of goods sold/creditors) 12 times

Gross profit/sales   25%

Proposed dividend   20%

Tax rate   33 1/3%

Debt service coverage ratio 1 time

Interest coverage ratio 3 times interest on the balance of loan outstanding on 1.4.2008

Selling and distribution expenses Rs. 1,80,000

Depreciation rate   40%

Cost of goods sold does not include depreciation.

On the basis of the above-mentioned information, you are required to complete the balance sheet as on 31.3.2009.

Solution :

Balance Sheet

Liabilities	Rs.	Rs	Assets	Rs.	Rs
Share capital		200000	Land		120000
General reserve opening	60000		Plant & machinery (cost) 300000		
(+) additions	40000	100000	(-) depreciation	120000	180000
15% loan	400000		Closing Stock		120000
(-)	200000	200000	Debtors		160000
			Cash and bank		120000
Creditors		120000			
Provision for tax		40000			
Proposed dividend		40000			
		700000			700000

❖   Debtors velocity = (Sales / debtors) = 12

Debtors = sales / 12

❖   Stock velocity = COGS / stock = 12

(75% sales) / Stock = 12

Stock = 0.75 sales / 12

Debtors : stock = (sales / 12) : (0.75 sales/ 12) = 1: 0.75 or 4 : 3

Stock + Debtors = 280000

Debtors = 160000 and stock = 120000

❖   Gross profit ratio = 25%

Gross profit = 19,20,000 x 25% = 4,80,0000

COGS = Sales – G.P = 14,40,000

❖   Creditors turnover ratio = COGS / creditors = 12,

Creditors = 1,20,000

❖   Interest coverage ratio = EBIT / Interest

(PBT + Interest) / interest = (120000 + Interest) / Interest = 3

Interest = 60000

❖   Debt service coverage ratio = (80000 + 60000 + 120000) / installment = 1

Installment = 260000

(-) interest =   60000

Principal   200000

Given tax rate @ 33.33% and tax paid = 40000

PBT = (40000 / 33.33) x 100 = 120000

Income Statement

Sales = (debtors × 12) = 160000 x 12		1920000
(-) COGS		1440000
Gross profit		480000
(-) operating expenses (given)	180000	
Dep. (b/f)	120000	300000
EBIT		180000
(-) Interest		60000
PBT		120000
(-) Provision for tax		40000
PAT		80000
(-) dividend		40000
Profit retained		40000

Illustration 9

A company has maintained the following relationships in recent years :

Gross profit to net sales	40%
Net profit to net sales	10%
Selling expenses to net sales	20%
Book debts turnover	8 per annum
Inventory turnover	6 per annum
Quick ratio	2
Current ratio	3
Assets turnover (sales basis)	2 per annum
Total assets to intangible assets	20
Accumulated depreciation to cost of fixed assets	1/3
Book dets to sundry creditors (for goods)	1.5
Shareholders' funds to working capital	1.6
Total debt to shareholders' funds	0.5

Quick assets comprise 25% cash, 15% marketable securities and 60% book debts. During 2008-2009, the company earned Rs. 1,20,000 or Rs.4.68 per equity share; the market value of one equity share was Rs. 78. The capital consisted of equity shares issued at a premium of 10% and 12% preference shares of Rs. 100 each. Interest was earned 17 times in 2008-2009. Many years ago the company had issued 10% debentures due for redemption in 2010. During 2008-2009 there was no change in the level of inventory, book debts, debentures and shareholders' funds. All purchases and sales were on account. Preference dividend paid in 2008-2009, in full, was Rs. 3,000.

You are required to prepare the balance sheet and the profit and loss account relating to 2008-2009. Ignore taxation including corporate dividend tax.

Solution :

PAT	120000
(-) preference dividend	3000
Equity earnings	117000
EPS	4.68
No of shares	25000

Preference share capital = 3000 / 0.12 = 25000

Equity share capital = 25000 x 10 = 250000

Share premium(10 %) = 250000 x 10% = 25000

Sales = (Net profit / 10%) = (120000 / 0.1) = 1200000

(-) Cost of goods sold	1200000 x 60% =	720000
Gross profit (40%) =		480000
(-) operating expenses:		
Selling expenses (20% of sales)		240000
Other expenses (b/f)		112500
EBIT		127500
(-) interest (10% debts) [i.e750000 x 10%]		7500
PAT		120000

Interest coverage ratio =   EBIT / interest = 17

(PBT + Interest) / Interest   = 17

Interest   = PBT/16

Interest   = (120000 / 16)

Therefore interest = 7500

Debtors = (sales / 8) = 1200000 / 8 = 150000

Stock turnover ratio = cost of sales / 6

Closing stock   = 720000 / 6 = 120000

Assets turnover ratio = Sales / Assets = 2

= 1200000 / total assets = 2

Total assets = 600000

Intangible assets   = total assets / 20 = 600000 / 20 = 30000

Debtors / creditors   = 1.5

=> Creditors   = 150000 / 1.5 = 100000

Balance Sheet

Liabilities	Rs	Assets		Rs
Equity share capital	250000	Fixed assets	292500	
(-) depreciation			97500	195000
Preference share capital	25000	Intangible assets		30000
Share premium	25000	Stock		120000
Closing creditors	100000	Debtors		150000
Others liabilities	25000	Cash		62500
		Prepaid (b/f)		5000
		Securities		37500
	600000			600000

Total debt to share holders funds = 0.5

Quick assets :

   Cash (25 %)   62500

   Securities (15%)   37500

   Debtors   150000

   Total Quick Assets   250000

   Quick ratio = (Quick assets / current liabilities) = 2

   Current liabilities = 250000 / 2 = 125000

   Current assets   = 375000 [3 × Current liabilities]

Illustration 10

The summarized balance sheet of a company as at 31st March, 2009 is provided below.

	Rs/lakh		Rs/lakh	Rs/lakh
Equity shares (Rs.10)	18.00	Fixed assets	75.00	
Share premium	20.00	Less accumulated		
General reserves	23.00	depreciation	25.00	50.00
		Current assets:		
Long-term debt	12.00	Inventories	10.00	
Proposed dividend	3.60	Debtors	18.00	
Creditors:		Cash and bank	5.00	
Goods	6.00	Other current assets	1.00	
Expenses	1.40			
	84.00		84.00	

Using the following information prepare the projected profit and loss account, balance sheet and the statement of cash flows for 2009-10.

Sales (all credit) growth	5%
Improvement in G.P. margin	2%
Selling general and administrative expenses	30% (of sales)
Depreciation expense/prior-year fixed asset (gross)	5%
Interest expenses/prior-year long-term debt	9%
Debtors (average) turnover	4 times
Capital expenditure (acquisition of new buildings and equipment) 8.5% of turnover	
Year-end accrued expenses	Rs. 0.75 lakh
Turnover of average inventory	4 times
Year-end other current assets	Rs. 1 lakh
Turnover average creditors	1.20 month
Proposed dividend per share	Rs. 2.5
Income-tax expense/pre-tax profit	35%
Year-end cash and bank balance	Equal to a level measured by the ratio of cash and bank balance to sales revenue prevailing in the prior year
Additions to long-term debt	Equal to the amount needed to meet the desired year-end cash and bank balance

Sales revenue in the prior year amounted to Rs. 80,00,000 The company's gross margin was 50% Show all necessary workings.

Solution :

Projected profit and loss a/c for 2009-10

Sales [80lakhs + 5 % of 80lakhs]		8400000
Cost of goods sold = 49 % [working notes]		4116000
Gross profit		4284000
(-) operating expenses		
Selling and administration expenses [30% of sales]	2520000	
Depreciation [75lakhs x 5%]	375000	2895000
Earnings before interest and tax		1389000
(-) interest [12lakhs x 9%]		108000
Profit before tax		1281000
Provision for taxation @ 35%		448350
Profit after tax		832650
(-) dividend paid [2.5 x 18lakhs]		450000
Profit / Earnings retained		382650

$$\text{Debtors (average) turnover ratio} = 4 = \frac{\text{Sales}}{\text{Average Debtors}}$$

Average debtors = 2100000

Closing debtors = 2400000

Fixed assets purchased = 8400000 x 8.5 % = 714000

Outstanding expenses =   75000

Stock turnover ratio = (cost of goods sold / average stock) = 4

Average stock = 1029000

Closing stock = 1058000

Creditors turnover ratio = (Purchases / Average creditors) = 1.2

Opening stock + Purchases – Closing stock = cost of goods sold

1000000 + Purchases – 1058000   = 4116000

Purchases   = 4174000

Average creditors = 417400

Closing creditors = 234800

Ratio of cash and bank to the sales in the previous year = 625000

Therefore Cash and Bank for this year = 525000

Balance sheet

Liabilities	Rs	Assets	Rs
Equity share capital	1800000	Fixed Assets 75 .00	
		(-) depreciation 28.75	
		(+) additions 7.14	5339000
Share premium	2000000	Inventories	1058000
General reserve	2682650	Debtors	2400000
Proposed dividend	450000	Cash and bank	525000
Creditors	234800	Others current assets	100000
Outstanding	75000		
Long term debt	2179550		
	9422000		9422000

Working notes :

Gross profit ratio   = [50 % + 2 % of 50%]

                  GP ratio   = 50% + 1% = 51%

Illustration 11

Coomer Ltd. has at the beginning of a period 1,00,000 Equity Shares of Rs. 10 each and 12% long-term debt of Rs. 8,00,000. The finance department of the company has generated the following forecast financial statistics for the period:

Return on Total Assets (ROTA)   20%

(PBIT / Total Assets)

Debt Ratio (External Liabilities / Equity)   0.80

Effective Interest Rate (EIR)   8%

(Interest Expense/ Total Liabilities)

Current Assets to Fixed Assets   0.5:1

Tax Rate   40%

The Assets, Liabilities and Equity figures used to compute the above financial statistics are based on forecast period-end balances. The company has no plan to change its equity share capital and long-term debt.

You are required to:

Prepare the forecast balance sheet as at the end of the forecast period with as many details as possible; and Forecast Earnings per Share (EPS).

Show necessary workings.

Solution :

Capital = 1000000

12%Long term debt = 800000

Effective interest rate = (interest / total liability)

$\Rightarrow$ (96000 / total liability) = 0.08

$\Rightarrow$ Total liability = (96000 / 0.08)   =   1200000

12% long term debt   =   800000

Other short term liabilities   =   400000

Debt equity ratio = (external debt / equity) = 0.8

Equity = (1200000 / 0.8)   =   1500000

(-) Capital   =   1000000

Reserves   =   500000

Balance sheet

Liabilities	Rs	Assets	Rs
Capital	1000000	Fixed assets = [27 x (2 / 3)]	1800000
Reserves	500000	Current assets	
		= (1 / 2 of fixed assets)	900000
Long term	800000		
Other Short term	400000		
	2700000		**2700000**

Return on total assets   = 20%

PBIT = 20 %   of Total Assets

PBIT   540000   [2700000 x 20 %]

(-) Interest   96000

PBT   444000

(-) Tax @ 40%   177600   [444000 x 40%]

PAT   266400

No of shares   100000

Earnings per share 2.664 per share

Study Note - 4

LEVERAGE

Analysis of Operating and Financial Leverages

This Section includes :

- **Concept and Nature of Leverages Operating Risk and Financial risk and Combined Leverage.**
- **Operating leverages and CVP analysis and EPS, indifference point.**

INTRODUCTION :

The concept of leverage has its origin in science. It means influence of one force over another. Since financial items are inter-related, change in one, causes change in profit. In the context of financial management, the term 'leverage' means sensitiveness of one financial variable to change in another. The measure of this sensitiveness is expressed as a ratio and is called degree of leverage.

Algebrically, the leverage may be defined as,

$$\text{Leverage} = \frac{\%\ \text{Change in one variable}}{\%\ \text{Change in some other variable}}$$

CONCEPT AND NATURE OF LEVERAGES OPERATING RISK AND FINANCIAL RISK AND COMBINED LEVERAGE :

Measures of Leverage

To understand the concept of leverage, it is imperative to understand the three measures of leverage

- (i) Operating Leverage
- (ii) Financial Leverage
- (iii) Combined Leverage

In explaining the concept of leverage, the following symbols and relationship shall be used :

Number of units produced and sold = Q

Sale Price per unit = S

Total Sale Value or Total Revenue = SQ

Variable Cost per unit = V

Total Variable Cost = VQ

Total Contribution = Total Revenue – Total Variable Cost

$$= SQ - VQ$$

$$= Q\,(S{-}V)$$

$$\text{Contribution per unit} = \frac{\text{Total Contribution}}{\text{Units sold}}$$

$$= \frac{Q(S-V)}{Q} = S - V = C$$

Earning before Interest and Tax = EBIT

$\qquad\qquad$ = Total Contribution – Fixed Cost

$\qquad\qquad$ If, Fixed Cost = F

$\qquad\qquad$ Then, EBIT = Q (S – V) – F

$\qquad\qquad$ = CQ – F. (Here, CQ denotes contribution)

Operating Leverage

It is important to know how the operating leverage is measured, but equally essential is to understand its nature in financial analysis.

Operating leverage reflects the impact of change in sales on the level of operating profits of the firm.

The significance of DOL may be interpreted as follows :

- Other things remaining constant, higher the DOL, higher will be the change in EBIT for same change in number of units sold in, if firm A has higher DOL than firm B, profits of firm A will increase at faster rate than that of firm B for same increase in demand.

This however works both ways and so losses of firm A will increase at faster rate than that of firm B for same fall in demand. This means higher the DOL, more is the risk.

- DOL is high where contribution is high.

- There is an unique DOL for each level of output.

Operating Leverage examines the effect of the change in the quantity produced on the EBIT of the Company and is measured by calculating the degree of operating leverae (DOL) The degree of operating leverage is therefore ratio between proportionate change in EBIT and corresponding proportionate change in Q.

$$\text{Thus DOL} = \frac{\Delta EBIT / EBIT}{\Delta Q / Q}$$

Putting, EBIT = CQ – F in above equation, we get

$$DOL = \frac{CQ}{CQ - F} = \frac{\text{Contribution}}{\text{EBIT}}$$

Financial Leverage

The Financial leverage may be defined as a % increase in EPS associated with a given percentage increase in the level of EBIT. Financial leverage emerges as a result of fixed financial charge against the operating profits of the firm. The fixed financial charge appears in case the funds requirement of the firm are partly financed by the debt financing. By using this relatively cheaper source of finance, in the debt financing, the firm is able to magnify the effect of change in EBIT on the level of EPS.

The significnace of DFL may be interpreted as follows :

- Other things remaining constant, higher the DFL, higher will be the change in EPS for same change in EBIT. In other words, if firm K has higher DFL than firm L, EPS of firm K increases at faster rate than that of firm L for same increase in EBIT. However, EPS of firm K falls at a faster rate than that of firm K for same fall in EBIT. This means, higher the DFL more is the risk.

- Higher the interest burden, higher is the DFL, which means more a firm borrows more is its risk.

- Since DFL depends on interest burden, it indicates risk inherent in a particular capital mix, and hence the name financial leverage.

There is an unique DFL for each amount of EBIT.

While operating leverage measures the change in the EBIT of a company to a particular change in the output, the financial leverage measures the effect of the change in EBIT on the EPS of the company.

Thus the degree of financial leverage (DEL) is ratio between proportionate change in EPS and proportionate change in EBIT.

$$\text{Here, } EPS = \frac{(EBIT - I)\ (I - T) - D}{N}$$

Where   I = Interest

t = Tax rate

D = Preference Dividend

N = No of equity shares.

$$DFL = \frac{\Delta EPS / EPS}{\Delta EBIT / EBIT}$$

Substituting the value of EPS above, we have

$$DEL = \frac{EBIT\ (1 - t)}{(EBIT - I)(I - t) - D}$$

If there is no preference share capital,

$$\text{then } DEL = \frac{EBIT}{EBIT - I}$$

$$= \frac{\text{Earning before interest and tax}}{\text{Earning after interest}}$$

Combined Leverage

The operating leverage explains the business risk of the firm whereas the financial leverage deals with the financial risk of the firm. But a firm has to look into the overall risk or total risk of the firm, which is busines risk plus the financial risk.

One can draw the following general conclusion about DCL.

● Other things remaining constant, higher the DCL, higher will be the change in EPS for same change in Q (Demand).

● Higher the DCL, more is the overall risk, and higher the fixed cost and interest burden lower is the earning after interest, and higher is the DCL.

● There is an unique DCL, for each level of Q.

A combintation of the operating and financial leverages is the total or combination leverage.

The operating leverage causes a magnified effect of the change in sales level on the EBIT level and if the financial leverage combined simultaneously, then the change in EBIT will, in turn, have a magnified effect on the EPS. A firm will have wide fluctuations in the EPS for even a small change in the sales level. Thus effect of change in sales level on the EPS is known as combined leverage.

Thus Degree of Combined leverage may be calculated as follows :

$$DCL = \frac{\% \text{ Change in EPS}}{\% \text{ Change in Sales}} = \frac{\Delta EPS / EPS}{\Delta Q / Q}$$

It measures sensitively of EPS to change in Q. It is not a distinct type of leverage analysis, it is product of the operating leverage and financial leverage.

$$\text{in } DCL = \frac{\Delta EPS / EPS}{\Delta Q / Q}$$

$$= \frac{\Delta EPS / EPS}{\Delta EBIT / EBIT} \times \frac{\Delta EBIT / EBIT}{\Delta Q / Q}$$

$$= DFL \times DOL$$

$$= \frac{EBIT}{EBIT - T} \times \frac{CQ}{EBIT} = \frac{CQ}{EBIT - I}$$

Degree of Combined leverage

$$DOL = \frac{\text{Contribution}}{\text{Earning before Interest and Tax}} = \frac{C}{EBIT}$$

$$DFL = \frac{\text{Earning before Interest and Tax}}{\text{Earning after Interest}} = \frac{EBIT}{EBIT - I}$$

$$DCL = \frac{Contribution}{Earning \ after \ Interest} = \frac{C}{EBIT - I}$$

OPERATING LEVERAGE AND CVP ANALYSIS AND EPS, INDIFFERENCE POINT :

Operating Break Even Point (BEP)

This is value of Q, at which EBIT = 0.

If operating break even point is denoted by Q_1 units, then

$SQ_1 - VQ_1 -$ Fixed Cost = 0

$Q_1 (S - V) -$ Fixed Cost = 0

Q_1 (Contribution) – Fixed Cost = 0

$$Q_1 = \frac{Fixed \ Cost}{Contribution} \Rightarrow Operating \ BEP.$$

Whereas, $DOL = \dfrac{Contribution}{EBIT}$

- Thus EBIT is negative below operating BEP, thus DOL is negative below that point.
- EBIT is positive above operating BEP, DOL is positive above that point.
- EBIT = 0 at operating BEP. DOL is undefined at operating BEP.
- DFL = 0 at operating BEP, as at operating BEP, EBIT = 0.

Earning per Share

If interest = I

Tax per Rs. of taxable income = t

Preference Dividend = D

No of equity shares = E

$$EPS = \frac{(EBIT - I)(I - t) - D}{N}$$

EBIT – EPS Indifference Point

The amount of EBIT, at which EPS under two capital mixes are equal, is called the EBIT – EPS indifference point.

To explain this, we may use the following equation :

$$EPS = \frac{(EBIT - I)(1 - t) - D}{N}$$

Putting two different values of I, D and N in the above eqution, we can find two equation representing EPS in terms of EBIT under two proposed mixes.

Equating these two equations, and solving for EBIT, we can find the indifference point.

The linear relationship developed between EBIT and EPS using above equation for two capital mixes can be plotted on a graph paper in the form of two straight lines. In the following figure, the indifference point is shown at point G.
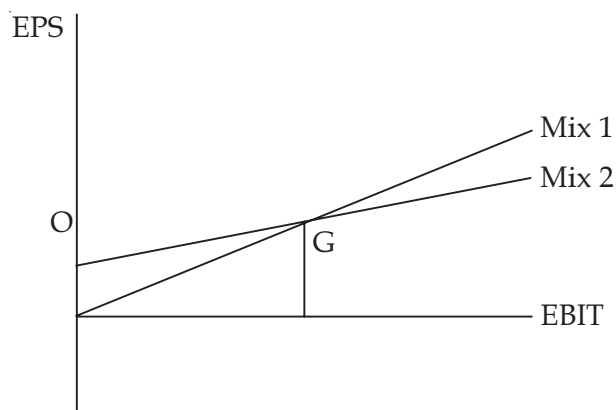
ILLUSTRATIONS

Illustration 1

Calculate the degree of operating leverage (DOL), degree of financial leverage (DFL) and the degree of combined leverage (DCL) for the following firms and interpret the results.

	Firm K	Firm L	Firm M
1. Output (Units)	60,000	15,000	1,00,000
2. Fixed costs (Rs.)	7,000	14,000	1,500
3. Variable cost per unit (Rs.)	0.20	1.50	0.02
4. Interest on borrowed funds (Rs.)	4,000	8,000	—
5. Selling price per unit (Rs.)	0.60	5.00	0.10

Solution :

	Firm K	Firm L	Firm M
Output (Units)	60,000	15,000	1,00,000
Selling Price per unit (Rs.)	0.60	5.00	0.10
Variable Cost per unit	0.20	1.50	0.02
Contribution per unit (Rs.)	0.40	3.50	0.08

Total Contribution	Rs. 24,000	Rs. 52,500	Rs. 8,000
(Unit × Contribution per unit)			
Less : Fixed Costs	7,000	14,000	1,500
EBIT	17,000	38,500	6,500
Less : Interest	4,000	8,000	—
Profit before Tax (P.B.T.)	13,000	30,500	6,500

Degree of Operating Leverage

$$\frac{\text{Contribution}}{\text{EBIT}} =$$

24,000	52,500	8,000
17,000	38,000	6,500
= 1.41	= 1.38	= 1.23

Degree of Financial Leverage

$$\frac{\text{EBIT}}{\text{PBT}} =$$

17,000	38,500	6,500
13,000	30,500	6,500
= 1.31	= 1.26	= 1.00

Degree of Combined Leverage

$$\frac{\text{Contribution}}{\text{PBT}} =$$

24,000	52,500	8,000
13,000	30,500	6,500
= 1.85	= 1.72	= 1.23

Interpretation :

High operating leverage combined with high financial leverage represents risky situation. Low operating leverage combined with low financial leverage will constitute an ideal situation. Therefore, firm M is less risky because it has low fixed cost and low interst and consequently low combined leverage.

Illustration 2.

A firm has sales of Rs. 10,00,000, variable cost of Rs. 7,00,000 and fixed costs of Rs. 2,00,000 and debt of Rs. 5,00,000 at 10% rate of interest. What are the operating, financial and combined leverages? It the firm wants to double its Earnings before interest and tax (EBIT), how much of a rise in sales would be needed on a percentage basis?

Solution :

Statement of Existing Profit

Sales	Rs. 10,00,000
Less : Variable Cost	7,00,000
Contribution	3,00,000
Less : Fixed Cost	2,00,000
EBIT	1,00,000
Less : Interest @ 10% on 5,00,000	50,000
Profit before tax (PBT)	50,000

$$\text{Operating Leverage} = \frac{\text{Contribution}}{\text{EBIT}} = \frac{3,00,000}{1,00,000} = 3$$

$$\text{Financial Leverage} = \frac{\text{EBIT}}{\text{PBT}} = \frac{1,00,000}{50,000} = 2$$

Statement of Sales needed to Double the EBIT

Operating leverage is 3 times *i.e.,* 33-1/3% increase in sales volume cause a 100% increase in operating profit or EBIT. Thus, at the sales of Rs. 13,33,333, operating profit or EBIT will become Rs. 2,00,000 *i.e.,* double the existing one.

Verification

Sales	Rs. 13,33,333
Variable Cost (70%)	9,33,333
Contribution	4,00,000
Fixed Costs	2,00,000
EBIT	2,00,000

Illustration 3.

X Corporation has estimated that for a new product its break-even point is 2,000 units if the items are sold for Rs. 14 per unit; the cost accounting department has currently identified variable cost of Rs. 9 per unit. Calculate the degree of operating leverage for sales volume of 2,500 units and 3,000 units. What do you infer from the degree of operating leverage at the sales volumes of 2,500 units and 3,000 units and their difference if any?

Solution :

Statement of Operating Leverage

Particulars	2500 Units	3000 Units
Sales @ Rs. 14 per unit	35,000	42,000
Variable cost	22,500	27,000
Contribution	12,500	15,000
Fixed cost (2000×Rs. 14–9)	10,000	10,000
EBIT	2,500	5,000
$\text{Operating Leverage} = \dfrac{\text{Contribution}}{\text{EBIT}} =$	$\dfrac{12,500}{2,500}$	$\dfrac{15,000}{5,000}$
=	5	3

At the sales volume of 3000 units, the operating profit is Rs. 5,000 which is double the operating profit of Rs. 2,500 (sales volume of 2,500 units) because of the fact that the operating leverage is 5 times at the sales volume of 2,500 units. Hence increase of 20% in sales volume, the operating profit has increased by 100% *i.e.,* 5 times of 20%. At the level of 3000 units, the operating leverage is 3 times. If there is change in sales from the level of 3,000 units, the % increase in EBIT would be three times that of % increase in sales volume.

Illustration 4.

The following information is available for ABC & Co.

EBIT	Rs. 11,20,000
Profit before Tax	3,20,000
Fixed costs	7,00,000

Calculate % change in EPS if the sales are expected to increase by 5%.

Solution :

In order to find out the % change in EPS as a result of % change in sales, the combined leverage should be calculated as follows :

Operating Leverage	= Contribution/EBIT
	= Rs. 11,20,000+Rs. 7,00,000/11,20,000
	= 1.625
Financial Leverage	= EBIT/Profit before Tax
	= Rs 11,20,000/3,20,000
	= 3.5
Combined Leverage	= Contribution/Profit before tax = OL×FL
	= 1.625×3.5 = 5.69.

The combined leverage of 5.69 implies that for 1% change in sales level, the % change in EPS would be 5.69%. So, if the sales are expected to increase by 5%, then the % increase in EPS would be 5×5.69 = 28.45%.

Illustration 5.

XYZ and Co. has three financial plans before it, Plan I, Plan II and Plan III. Calculate operating and financial leverage for the firm on the basis of the following information and also find out the highest and lowest value of combined leverage :

Production	800 Units	
Selling Price per unit	Rs. 15	
Variable cost per unit	Rs. 10	
Fixed Cost : Situation A	Rs. 1,000	
Situation B	Rs. 2,000	
Situation C	Rs. 3,000	

Capital Structure	Plan I	Plan II	Plan III
Equity Capital	Rs. 5,000	Rs. 7,500	Rs. 2,500
12% Debt	5,000	2,500	7,500

Solution :

Calculation of Operating Leverage :

	Situation A	Situation B	Situation C
Number of unit sold	800	800	800
Sales @ Rs. 15	12,000	12,000	12,000

Variable cost @ Rs. 10	8,000	8,000	8,000
Contribution	4,000	4,000	4,000
Fixed cost	1,000	2,000	3,000
EBIT	3,000	2,000	1,000
Operating Leverage (Contribution/EBIT)	1.33	2.00	4.00

Calculation of Financial Leverage :

	Plan I	Plan II	Plan III
Situation A			
EBIT	Rs. 3,000	Rs. 3,000	Rs. 3,000
Less : Interest @ 12%	600	300	900
Profit before Tax	2,400	2,700	2,100
Financial Leverage (EBIT/Profit before Tax)	1.25	1.11	1.43
Situation B			
EBIT	Rs. 2,000	Rs. 2,000	Rs. 2,000
Less : Interest @ 12%	600	300	900
Profit before Tax	1,400	1,700	1,100
Financial Leverage (EBIT/Profit before Tax)	1.43	1.18	1.82
Situation C			
EBIT	Rs. 1,000	Rs. 1,000	Rs. 1,000
Less : Interest @ 12%	600	300	900
Profit before Tax	400	700	100
Financial Leverage (EBIT/Profit before Tax)	2.5	1.43	10.0

Calculation of Combined Leverage :

The combined leverage may be calculated by multiplying the operating leverage and financial leverage for different combination of Situation A, B & C and the Financial Plans, I, II & III as follows :

	Situation A	Situation B	Situation C
Plan I	1.66	2.86	10
Plan II	1.47	2.36	5.72
Plan III	1.90	3.64	40

The calculation of combined leverage shows the extent of the total risk and is helpful to understand the variability of EPS as a consequence of change in sales levels. In this case, the highest combined leverages is there when financial plan III is implemented in situation C;

and lowest value of combined leverage is attained when financial Plan II is implemented in situation A.

Illustration 6.

The following data relates to two companies A Ltd. and B Ltd.

	A Ltd.	B Ltd.
Capital Employed :		
Equity share capital (in Rs. 10 shares)	5,00,000	2,50,000
9% Debentures	–	2,50,000
Earnings before interest and tax	1,00,000	1,00,000
Return on capital employed	20%	20%

The equity shareholders of A Ltd. find to their dismay that in spite of same return earned by their company on the total capital employed, their earning per share is much less as compared to B Ltd.

You are required to state for the satisfaction of the shareholders of A Ltd., the reasons for such lower earnings per share on their capital. Assume the tax at 50%.

Solution :

In order to find out the reasons for a higher rate of earning for the shareholders of B Ltd., the earning per share for both the companies have to be calculated :

Computation of Earning per Share

	A Ltd.	B Ltd.
Earnings before Interest and Tax	Rs. 1,00,000	Rs. 1,00,000
Less : Debenture interest	–	22,500
Profit before tax	1,00,000	77,500
Less : Taxes at 50%	50,000	38,750
Profit after tax	50,000	38,750
Numbers of shares	50,000	25,000
Earning per share (EPS)	1	1.55
Financial leverage = $\dfrac{\text{EBIT}}{\text{PBT}}$	$\dfrac{1,00,000}{1,00,000}$	$\dfrac{1,00,000}{77,500}$
	= 1	= 1.29

On the basis of above calculations, two causes which leads to lower EPS in case of A Ltd. as compared to EPS of B Ltd. may be noted as follows :

(i) The B Ltd. has a higher financial leverage of 1.29 and it is taking the advantage of cheaper debt. It has borrowed half of its capital funds @ 9% which is much lower than the return on capital employed of 20%. This savings of 11% has resulted in the benefit to the shareholders and thus has a higher EPS. The benefit of employing cheaper debt may be explained as follows :

11% Saving on Rs. 2,50,000	Rs. 27,500	
Less : Tax paid @ 50%	13,750	
Net benefit to the shareholders	Rs. 13,750	

This extra benefit of Rs. 13,750 available to the equity shareholders has resulted in higher EPS by Rs. .55 for the shareholders of B Ltd. (*i.e.,* Rs. 13,750/25,000).

(ii) The total number of equity shares in B Ltd. is 25000 as against the 50000 shares issued by A Ltd. Consequently, the after tax benefit has accrued to the shareholder of 25000 shares only and has resulted in increase in the EPS of B Ltd. as compared to EPS of A Ltd.

Illustration 7.

The selected financial data for A, B and C companies for the year ended March, 2009 are as follows :

	A	**B**	**C**
Variable expenses as a % Sales	66.67	75	50
Interest	Rs. 200	Rs. 300	Rs. 1,000
Degree of Operating leverage	5 : 1	6 : 1	2 : 1
Degree of Financial leverage	3 : 1	4 : 1	2 : 1
Income tax rate	50%	50%	50%

Prepare Income Statements for A, B and C companies.

Solution :

The information regarding the operating leverage and financial leverage may be interpreted as follows–For Company A, the DFL is 3 : 1 (*i.e.,* EBIT : PBT) and it means that out of EBIT of 3, the PBT is 1 and the remaining 2 is the interest component. Or, in other words, the EBIT : Interest is 3 : 2. Similarly, for the operating leverage of 6 : 1 (*i.e.,* Contribution- EBIT) for Company B, it means that out of Contribution of 6, the EBIT is 1 and the balance 5 is fixed costs. In other words, the Fixed costs : EBIT is 5 : 1. This information may be used to draw the statement of sales and profit for all the three firms as follows :

Statement of Operating Profit and Sales

Particulars	A	B	C
Financial leverage = (EBIT/PBT) =	3 : 1	4 : 1	2 : 1
or, EBIT/Interest	3 : 2	4 : 3	2 : 1
Interest	Rs. 200	Rs. 300	Rs. 1,000
EBIT	200×3/2	300×4/3	1,000×2/1
	= 300	= 400	= 2,000
Operating leverage = (Cont./EBIT)	= 5 : 1	6 : 1	2 : 1
i.e., Fixed Exp./EBIT	= 4 : 1	5 : 1	1 : 1
Variable Exp. to Sales	66.67%	75%	50%
Contribution to Sales	33.33%	25%	50%
Fixed costs	300×4/1	400×5/1	2,000×1/1

	= 1,200	= 2,000	= 2,000
Contribution = (Fixed cost + EBIT)	1,500	2,400	4,000
Sales	4,500	9,600	8,000

Income Statement for the year ended 31.03.09

Particulars	A	B	C
Sales	Rs. 4,500	Rs. 9,600	Rs. 8,000
Variable cost	3,000	7,200	4,000
Contribution	1,500	2,400	4,000
Fixed Costs	1,200	2,000	2,000
EBIT	300	400	2,000
Interest	200	300	1,000
PBT	100	100	1,000
Tax at 50%	50	50	500
Profit after Tax (PAT)	50	50	500
Operating leverage (Cont./EBIT) =	5	6	2
Financial leverage (EBIT/PBT) =	3	4	2
Combined leverage	15	24	4

Illustration 8.

The following data is available for XYZ Ltd. :

Sales	Rs. 2,00,000
Less : Variable cost @30%	60,000
Contribution	1,40,000
Less : Fixed Cost	1,00,000
EBIT	40,000
Less : Interest	5,000
Profit before tax	35,000

Find out :

   (i) Using the concept of financial leverage, by what percentage will the taxable income increase if EBIT increase by 6%.

  (ii) Using the concept of operating leverage, by what percentage will EBIT increase if there is 10% increase in sales, and

 (iii) Using the concept of leverage, by what percentage will the taxable income increase if the sales increase by 6%. Also verify results in view of the above figures.

Solution :

   (i) **Degree of financial leverage :**

   DFL = EBIT/Profit before Tax = 40,000/35,000

   = 1.15

If EBIT increase by 6%, the taxable income will increase by 1.15×6 = 6.9% and it may be verified as follows :

EBIT (after 6% increase)	Rs. 42,400
Less : Interest	<u>5,000</u>
Profit before Tax	<u>37,400</u>

Increase in taxable income is Rs. 2,400 *i.e.,* 6.9% of Rs. 35,000

(ii) **Degree of operating leverage :**

DOL = Contribution/EBIT = 1,40,000/40,000   = 3.50

If Sales increase by 10%, the EBIT will increase by 3.50×10 = 35% and it may be verified as follows :

Sales (after 10% increase)	Rs. 2,20,000
Less : Variable Expenses @30%	<u>66,000</u>
Contribution	1,54,000
Less : Fixed cost	<u>1,00,000</u>
EBIT	<u>54,000</u>

Increase in EBIT is Rs. 14,000 *i.e.,* 35% of Rs. 40,000.

(iii) **Degree of combined leverage :**

DCL = Contribution/Profit before Tax = 1,40,000/35,000
= 4

If Sales increases by 6%, the profit before tax will increase by 4×6 = 24% and it may be verified as follows :

Sales (after 6% increase)	Rs. 2,12,000
Less : Variable Expenses @ 30%	<u>63,600</u>
Contribution	1,48,400
Less : Fixed cost	<u>1,00,000</u>
EBIT	48,400
Less : Interest	<u>5,000</u>
Profit before Tax	<u>43,400</u>

Increase in Profit before tax is Rs. 8,400 *i.e.,* 24% of Rs. 35,000.

Illustration 9.

(i) **Find out operating leverage from the following data :**

Sales	Rs. 50,000
Variable Costs	60%
Fixed Costs	Rs. 12,000

(ii) **Find out of financial leverage from the following data :**

Net Worth	Rs. 25,00,000
Debt/Equity	3 : 1

Interest rate	12%
Operating Profit	Rs. 20,00,000

Solution :

(i)

Sales		Rs.50,000
Less : Variable cost at 60%		30,000
Contribution		20,000
Less : Fixed Cost		12,000
Operating Profit		Rs. 8,000

$$\text{Operating Leverage} = \frac{\text{Contribution}}{\text{Operating Profit}} = \frac{20,000}{8,000} = 2.50$$

(ii)

Net worth	=	Rs. 25,00,000
Debt/Equity	=	3 : 1
Hence Debt	=	Rs. 75,00,000
EBIT		20,00,000
Less : Interest at 12% on 75,00,000		9,00,000
PBT		11,00,000

$$\text{Financial Leverage} = \frac{\text{EBIT}}{\text{PBT}} = \frac{20,00,000}{11,00,000} = 1.82$$

Illustration 10.

From the following, prepare Income Statements of A, B and C. Briefly comment on each firm's performance :

	Firm A	**Firm B**	**Firm C**
Financial Leverage	3 : 1	4 : 1	2 : 1
Interest	Rs. 200	Rs. 300	Rs. 1,000
Operating Leverage	4 : 1	5 : 1	3 : 1
Variable cost as a % of sales	66.67%	75%	50%
Income-tax Rate	45%	45%	45%

Solution :

Firm A Financial Leverage $= \dfrac{\text{EBIT}}{\text{EBT}} = \dfrac{3}{1}$ or EBIT = 3 × EBT   .... (1)

Again EBIT–Interest	=	EBT	
or EBIT-200	=	EBT	.... (2)

Taking (1) and (2) we get 3 EBT–200 = EBT

or 2 EBT=200 or EBT	=	Rs. 100
Hence EBIT=3EBT	=	Rs. 300

Again, the operating leverage = Contribution/EBIT = 4/1

EBIT = Rs. 300,

Contribution = 4×EBIT = Rs. 1,200

Now variable cost = 66.67% on sales

Contribution = 100–66.67% *i.e.*, 33-1/3% on sales

Hence sales = 1200/33-1/3% = Rs. 3,600.

Same way EBIT, EBT, Contribution and Sales for firms B and C can be worked out.

Firm B $\quad = \dfrac{\text{EBIT}}{\text{EBT}} = \dfrac{4}{1}$ or EBIT = 4EBT $\qquad$ ... (3)

Again EBIT–Interest = EBT or EBIT–300=EBIT $\qquad$ ... (4)

Taking (3) and (4) we get 4EBT–300 = EBT

or 3EBT=300 or EBT $\quad$ = $\quad$ Rs. 100

Hence EBIT = 4×EBT $\quad$ = $\quad$ Rs. 400

Again Operating leverage = Contribution/EBIT = 5/1

EBIT = Rs. 400, Hence Contribution = 5×EBIT = 2,000

Now variable cost = 75% on Sales

Contribution = 100–75% *i.e.*, 25% on Sales

Hence Sales = 2000/25% = Rs. 8,000.

Firm C $\quad$ Financial Leverage $\quad = \dfrac{\text{EBIT}}{\text{EBT}} = \dfrac{2}{1}$ or EBIT = 2EBT $\qquad$ ... (5)

Again EBIT–Interest = EBT or EBIT – 1000 = EBT $\qquad$ ... (6)

Taking (5) and (6) we get 2EBT–1000 = EBT or EBT = 1,000

Hence EBIT = 2 × EBT = $\quad$ Rs. 2,000

Again Operating leverage = Contribution/EBIT =3/1

EBIT = Rs. 2,000, Hence Contribution = 3×EBIT=6,000

Now Variable cost = 50% on Sales

Contribution = 100 – 50 = 50% on Sales

Hence Sales = 6,000/50% = Rs. 12,000.

Income Statement

	Firm A	Firm B	Firm C
Sales	Rs. 3,600	Rs. 8,000	Rs. 12,000
Less : Variable Cost	2,400	6,000	6,000
Contribution	1,200	2,000	6,000
Less : Fixed cost	900	1,600	4,000
EBIT	300	400	2,000
Less : Interest	200	300	1,000
EBT	100	100	1,000
Less : Tax @ 45%	45	45	450
Profit after Tax (PAT)	55	55	550

Interpretation

The financial position of firm C can be regarded better than that of other firm A and B because of the following reasons :

(i) Financial leverage is the measure of financial risk. Firm C has the least financial risk as it has minimum degree of financial leverge. No doubt it is true that there will be a more magnified impact on earnings per share on A and B firms than that of C due to change in EBIT but their EBIT level due to low sales is very low suggesting that such an advantage is not great.

(ii) Degree of combined leverage is maximum in firm B *i.e.,* 20, against firm A *i.e.,* 12 and firm C *i.e.,* 6. Clearly, the total risk (business and financial) complexion of firm C is the lowest, while that of other firms are very high.

(iii) The ability of firm C to meet interest liability is better than that of firms A and B as follows :

EBIT/Interest ratio for three firms :

A = 300/200 = 1.5

B = 400/300 = 1.33

C = 2,000/1,000 = 2

Study Note - 5

FINANCIAL STRATEGY

5.1 Understanding Financial Strategy

This Section includes :

- **Financial Strategy, Needs**
- **Best Practices in Creating a Strategic Finance Function**
- **Checklist for a Strategic Function**

INTRODUCTION :

Financial strategy is a topic of importance to middle and senior line managers, who face regularly a multiplicity of financial issues in their organisation. A sound financial strategy seeks to answer :

a. How does a Chief Financial Officer (CFO) determine the long-term target capital structure?

b. When to form holding and subsidiary structure or branch offices or subsidiaries overseas?

c. When and how should a company go public ?

d. Is it better to take a company private in a leveraged buyout or to borrow money and repurchase stock?

e. Can a CFO use derivatives in structuring acquisitions and share buybacks?

f. How does a CFO benefit out of doing business in other countries?

g. Above all, how can a CFO make sure that everyone in the company contributes to the common objective of maximising shareholder value?

h. How much should one pay for a company ?

i. What is the best way to fight a hostile bid ?

FINANCIAL STRATEGY, NEEDS :

Strategic financial decisions are based on rigorous cash-flow forecasts, together with accurate estimation and management of risk. It focuses on shareholder value creation, explore ways of increasing that value – both real and perceived – through :

a. astute choice of financing methods

b. financial restructuring, such as recapitalisations, share buybacks and leveraged buyouts

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c. asset restructuring, such as takeovers, mergers and acquisitions, spin-offs and equity carve-outs

d. credible and compelling communication with shareholders

e. developing a strong culture where all decision makers are motivated to create value

f. understanding how to increase the value of the company by appropriate investment

g. developing knowledge about the financial markets – particularly how the markets perceive the CFO's decisions and how CFO can change their perceptions

h. appreciating the financial strategy issues that affect the organisation.

i. undertaking financial analysis of the organisation and interpreting the results in the context of lending and investing decisions.

j. assessing the financial risks that the organization faces, in particular credit, interest and foreign exchange risk and adopting risk-hedging strategies that suit the risk profile of the organisation.

k. understanding how the organization should measure financial performance internally and how the financial performance is assessed by stakeholders in a global context.

l. Benchmarking strategies with competitors in Industry globally without restricting Comparisons to only local players.

BEST PRACTICES IN CREATING A STRATEGIC FUNCTION :

In the wake of recent accounting scandals and in the increasingly competitive business environment, many CFOs and the finance organizations they lead have started to take on new strategic roles within the enterprise. They are aiming at enforcing stricter control processes to ensure legal and regulatory compliance, offering strategic insights into the internal and external business environment, and connecting the business strategy with daily operations through performance tracking.

The trend toward a more strategic role is echoed by the responses of participants in recent research conducted by APQC, an internationally recognized nonprofit organization that provides best-practice research, metrics, and measures. The participants indicated that, three years down the road, they anticipate spending 30% more time on decision support and management. According to the same research, however, in spite of their aspirations, participants have not made much progress toward a greater strategic role. Finance organizations, no matter what their size, report to APQC that they still spend almost two-thirds of their time on transaction processing and controls and only one-third on decision support and management.

The difficulty in evolving the finance role lies in bridging the current gap between the finance function that emphasizes greater efficiency and the finance function that becomes a partner in managing the business. The best companies have found that reaching the goal of a more strategic finance function warrants a two-step approach, as follows:

1. These companies improve the efficiency of the various functions that come under the finance umbrella and, in the process, free up corporate resources for other activities. As one global treasury manager put it, "We must develop a finance function that is as efficient as it can be, replicate it globally, and then use it effectively to help us quickly establish brands and enter new markets." Companies like this one choose a variety of approaches to streamline and automate finance functions while ensuring that they keep customers happy (in the case of shared-services arrangements).

2. With the efficiency of the transaction and control functions assured, these companies can turn to devising a more strategic approach for finance – giving finance not only more of a decision-making responsibility in risk management and compliance but also a proactive role in managing the daily cash position and thus increase resources for quick strategic moves.

One global consumer products company took a two-step approach to a more strategic path for finance. In the first step, the company developed a more efficient cash management, accounts payable, and accounts receivable group of functions in its worldwide operations, based on greater transparency of information. In the second step, the company developed

"straight-through processing" along every level of the finance function, leveraging its global reach to maximize cash management efficiency, foreign exchange exposure, and the global supply chain to help fund growth, participate in new marketing and distribution arrangements, and comply with worldwide regulations.

CHECKLIST FOR A STRATEGIC FINANCE FUNCTION :

The best companies, and their CFOs, recognize the importance of ready access to the right information to drive the right choices between different variables. To help determine whether your finance function is moving toward a strategic approach, take a moment and decide whether your system does the following:

- Accelerates closing processes through automation, workflow, and collaboration

- Improves business analysis and decision support by providing historical and forward-looking views, including benchmarks

- Deploys performance management tools that analyze the company and its resources

- Maximizes cash flow through improved billing, receivables, collections, payments, and treasury management

- Increases effectiveness of compliance efforts through comprehensive auditing, deeper reporting, and management of internal controls (Sarbanes-Oxley)

In addition, a truly integrated and systematic foundation should help any one to achieve the following :

- Develop a closed-loop management process of strategy formulation, communication and measurement

- Monitor the performance of strategic key success factors using external and internal benchmarks

- Use tools that support a financial planning process that integrates global strategic planning and specific operational planning problems in a closed-loop process

In a similar way, you can also determine whether you are on the right track if your financial software provides the following :

- A single source for financial information (a prerequisite for managing business processes beyond financials, more effectively)

- More timely access to accurate data, improving communication between finance and operations

- Increased alignment between front- and backoffice applications, enabling management to better administer and track business strategy and decisions

- Reduced cost of compliance with industry regulations (U.S. Financial Accounting Standards Board and Sarbanes-Oxley)

- Improved security and controls and reduced risk of contractual and regulatory noncompliance

- Improved predictability, particularly with budget

One CFO admitted, "Until we began to appreciate the importance of simplicity in thinking through our finance function and making it more strategic, we did not realize the way that technology can help you deal with complexity, and allow you to achieve the strategic goals finance should achieve."

Are You a Strategic CFO?

As far as they've come, many senior finance executives still have the nagging feeling that they could be doing more.

Lisa Yoon, CFO.com

January 11, 2006

Bean counter. Numbers cop. Chief financial officers have long outgrown those stereotypes; today a more appropriate description might be business partner, strategist, first deputy to the CEO.

Yet as far as they've come, many senior finance executives still have the feeling that they could be doing more. Dan Chenoweth, a Denver-based business consultant and former finance executive, believes there are several reasons why finance chiefs don't always play a big enough role at the strategy table:

- First is the lingering self-perception of being the "reporter"; some CFOs don't view themselves as a partner with the rest of the senior team.

- Another reason is the famous finance-chief personality — reserved, reactive, even passive in the strategic-planning process.

- Finally, says Chenoweth, CFOs still tend to view their ultimate responsibility as fiduciary — saving company funds and reining in spending — rather than taking on the broader role of value creator.

That CFOs have these characteristics and self-perceptions is "an increasingly invalid generalization," maintains Steve Wasko, chief financial officer of Northbrook, Illinois-based Nanosphere Inc. He points to a shift in management philosophy from a model centered around the chief executive, in which senior managers carried out the CEO's vision, to today's increasingly team-oriented approach, in which the CFO and other senior managers help shape the company's direction and run the show.

Melissa Cruz, CFO of Waltham, Massachusetts-based BladeLogic, takes a more abstract view: "The role of the CFO is about imagining the future with the management team," she explains, "and then translating that into financial action."

Chenoweth does agree that there has been a "profound change" in the role of CFOs in recent years, but adds that they could "do more to blow their own horn at the strategy table."

"Do you still see CFOs with green eyeshades?" says Wasko. "Absolutely. But companies that have such CFOs are at a disadvantage."

5.2 Financial and Non-Financial Objectives of Different Organizations

This Section includes :

- **Need for a Range of Performance Measures**
- **Financial Vs. Non-Financial Measures**
- **Shareholders Impact of Non-Financial Objectives**

INTRODUCTION :

"It is not possible to manage what you cannot control and you cannot control what you cannot measure!" - Peter Drucker.

"We consider the advantages and disadvantages of stakeholder-oriented firms that are concerned with employees and suppliers as well as shareholders compared to shareholder-oriented firms. Societies with stakeholder-oriented firms have higher prices, lower output, and can have greater firm value than shareholder-oriented societies. In some circumstances, firms may voluntarily choose to be stakeholder-oriented because this increases their value. Consumers that prefer to buy from stakeholder firms can also enforce a stakeholder society. With globalization entry by stakeholder firms is relatively more attractive than entry by shareholder firms for all societies".

Inexorable change is the order of the day, and conventional theories and business practices are not providing the necessary guidance and support for decision-making. Change in every aspect and in the entire outlook is a constant factor. Business leaders are dissatisfied with the traditional measurement tools as organizations today increasingly perform in real time environment. New tools are being developed to measure the outcome of changes and their effective contribution.

NEED FOR A RANGE OF PERFORMANCE MEASURES :

Measurement system of performance has to progress from being reactive to being proactive and finally to be responsive, as the right metrics drive world class performance. Criteria of success are different from product to process, company perspective to stakeholder perspective, revenue to reputation and financial to non-financial.

The three roles of measurement are:

    a. Effectiveness – Are we doing the right things?

    b. Efficiency – Are we doing them well?

    c. Excellence – Are we doing them consistently, responsively to meet changing requirements

Why do we measure?

    a. To know current status, degree of achievement and how far to go for ultimate goals to be achieved;

b. For strategic alignments to communicate and reinforce messages to employees on company focus, direction and targets.

c. For strategic learning: to know what works and what does not work & to take better decisions:

- to identify pockets of excellence practices and universalize them

- to identify relationships between measures

- measurement is the trigger for excellence in performance & continuous improvement

- Strategic Management control of cost

- Organisational control is the process whereby an organisation ensures that it is pursuing strategies and actions which will enable it to achieve its goals.

- As to the selection of a range of performance measures which are appropriate to a particular company, this selection ought to be made in the light of the company's strategic intentions which will have been formed to suit the competitive environment in which it operates and the kind of business that it is. It is generally in line with the long-term vision, mission and strategies of the company.

- For example, if technical leadership and product innovation are to be the key source of a manufacturing company's competitive advantage, then it should be measuring its performance in this area relative to its competitors. If a service company decides to differentiate itself in the marketplace on the basis of quality of service, then, amongst other things, it should be monitoring and controlling the desired level of quality. The focus thus lies on quality and not just volume at any cost or price.

- Whether the company is in the manufacturing or the service sector, in choosing an appropriate range of performance measures it will be necessary, however, to balance them, to make sure that one dimension or set of dimensions of performance is not stressed to the detriment of others. While most companies will tend to organise their accounting systems using common accounting principles, they might differ widely in the choice, or potential choice, of performance indicators.

- Authors from differing management disciplines tend to categorise the various performance indicators that are available as follows:

competitive advantage	flexibility
financial performance	resource utilisation
quality of service	innovation

- These six generic performance dimensions fall into two conceptually different categories. Measures of the first two reflect the success of the chosen strategy, i.e., ends or results. The other four are factors that determine competitive success, i.e., means or determinants.

- Another way of categorising these sets of indicators is to refer to them either as upstream or as downstream indicators, where, for example, improved quality of service upstream leads to better financial performance downstream.

Table 1. Upstream Determinants and Downstream Results

Performance Dimensions	Types of Measures
Competitiveness	Relative market share and position Sales growth, Measures reg customer base
Financial Performance	Profitability, Liquidity, Capital Structure, Market Ratings, etc.
Quality of Service	Reliability, Responsiveness, Appearance, Cleanliness, Comfort, Friendliness, Communication, Courtesy, Competence, Access, Availability, Security etc.
Flexibility	Volume Flexibility, Specification and Speed of Delivery Flexibility
Resource Utilisation	Productivity, Efficiency, etc.
Innovation	Performance of the innovation process, Performance of individual innovations, etc.

Source: "Performance Measurement in Service Businesses" by Lin Fitzgerald, Robert Johnston, Stan Brignall, Rhian Silvestro and Christopher Voss, page 8.

FINANCIAL VS. NON-FINANCIAL MEASURES :

In many companies across the world, the familiar way is to view everything in terms of the bottom line. In this sort of corporate environment, financial indicators remain the fundamental management tool and could be said to reflect the capital market's obsession with profitability as almost the sole indicator of corporate performance. Opponents of this approach suggest that it encourages management to take a number of actions which focus on the short term at the expense of investing for the long term. It results in such action as cutting back on R & D revenue expenditure in an effort to minimise the impact on the costs side of the current year's P & L, or calling for information on cost benefit on expenses at too frequent intervals so as to be sure that targets are being met, both of which actions might actually jeopardise the company's overall performance rather than improve it.

Presently, there is a realization among managers that because of the pre-eminence of money measurement in the commercial world, the information derived from the many stages preceding the preparation of the annual accounts, such as budgets, standard costs, actual costs and variances, are actually just a one dimensional view of corporate activity. Increasingly, a large number of managers have recognized in recent years that a big part of a company's true value depends upon intangible factors such as organizational knowledge, customer satisfaction, product innovation and employee morale, rather than on physical assets like machinery or real estate. While companies recognize the importance of these intangible factors, understanding and measuring their role in value creation poses a formidable challenge. Human resources departments may know how to tabulate payroll for a certain plant, for

instance, but if asked to measure the motivation of its employees, they would probably be on uncertain ground. And yet, employee motivation and turnover are as crucial to that plant's profitability as the size of its payroll. That is the reason, employees are now called as 'resources' and the personnel department is called as human resources department.

Companies attach high value to financial performance. One reason could be that businesses have been tracking such performance longer than they have been trying to monitor how they are doing in areas such as employee satisfaction. Still, despite the importance of financial performance, executives ranked four other areas as being more important for future value generation: Employee satisfaction, supplier performance, product innovation and customer satisfaction.

The ability to manage alliances is seen as another crucial driver of future value. There are massive gaps between what executives believe are key drivers of future economic value and their organizations' ability to measure performance in these areas. The biggest gap is in the customer category, which indicates that companies are still wrestling with ways to measure customer loyalty and satisfaction. Companies are also giving more weightage to assess how well they are managing alliances and fostering employee satisfaction as executives believe that both these areas are crucial drivers of future value.

Unless organizations come to grips with these issues, its performance measures will fail to support its strategic objectives. Lack of good performance measures, could fail a good strategy. Besides, if companies track their performance in these key areas, this could lead to more dependable disclosure of their future prospects. It has also been found that with higher transparency and disclosure, the company's cost of capital could go down due to reduced risk for investors.

Stakeholders of an Organization

Few people would argue with the idea that commercial businesses' aim to make profits and that decisions in these businesses are focused around how best to achieve this objective. The desire to be profitable need not, however, be all embracing and in practice it can be seen that companies are likely to pursue a wide range of objectives, which are both financial and non-financial in nature.

The first thing to note is that the suggestion that companies seek to make profits is a little imprecise. Does this mean that profit is sought at all costs, that maximising profit is the sole aim, or that managers/owners are happy with a specific "satisfactory" level of profit? The exact answer will vary between businesses, as the priorities of owners and managers differ, but it is possible to establish some basic guidelines.

It is useful to remember that although a company is a separate entity in the legal sense, in reality it is made up of a collection of individuals and interest groups, all of whom have personal objectives to fulfil. Management will constantly be trying to balance the return to these groups e.g., shareholders or employees and discussion on corporate objectives really comes down to a compromise which takes account of what the different groups are seeking. Consequently some objectives may be financial in nature, such as a rise in earnings per share, whilst others will be non-financial e.g., shorter working hours, or an increase in the level of waste recycling in a manufacturing process.

A useful starting point for analysing non-financial objectives, is to specify the variety of stakeholders which may seek to influence company objectives, because they are affected by a company's operations. The list includes:

Equity investors— In other words the owners of the business, who will be looking for a decent financial return on their investment.

Creditors— This group will want to ensure that the business maintains the liquidity at reasonable level required to repay its dues on time.

Customers— Who will be concerned about product/service quality, price adherence to delivery schedule.

Employees— Improved working atmosphere and conditions of work will be important to this group and so they may have a mix of financial and non-financial concerns.

Managers— Whose personal objectives may to some extent conflict with those of the owners. For example, a manager may seek to increase staff levels, as a way of increasing his personal status, but this may be lead to reduced profits.

The community at large— Communities are affected by company activities in a number of ways such as the use of land in a local area, the potential for pollution from effluents, commercial sponsorship of community projects and the impact of business activity on local transport systems. Corporate Social Responsibility (CSR) is very important for each company to fulfill its social obligations.

Government, both Central State, are interested in higher tax revenues from the corportes so that the Government can project a better budget estimates and actuals.

Faced with such a broad range of interest groups, managers are likely to find that they cannot simultaneously maximise profits and the wealth of their shareholders whilst also keeping all the other parties happy. In this situation, the only practical approach is to try and work to satisfy the various objectives rather than maximise any individual one. Adopting such a strategy means, for example, that the company might earn a satisfactory return for its shareholders, whilst at the same time paying reasonable wages to satisfy employees, and avoiding polluting the environment, hence being a "good citizen." As a result, profit is no longer the sole corporate objective, and the pursuit of non-financial objectives has begun to be increasingly important, as part of a portfolio of corporate objectives which spread right out into the community of which they are a part.

Non-Financial Performance Indicators

Professor Robert Kaplan of Harvard Business School in The Evolution of Management Accounting states : "..... if senior managers place too much emphasis on managing by the financial numbers, the organisation's long term viability becomes threatened." That is, to provide corporate decision makers with solely financial indicators is to give them an incomplete set of management tools.

The case is two-fold: that firstly not every aspect of corporate activity can be expressed in terms of money and secondly that if managers aim for excellence in their own aspects of the business, then the company's bottom line will take care of itself.

Some of the important measures are given below:

1. Balanced Score Card (BSC) – offers four perspectives

   A. Financial– How do we look to our owners

   B. Customer– How do customers see us

   C. Internal– What we must excel at

   D. Business development– How can we develop business further

BSC puts strategy and vision at centre and not control. The BSC drives performance throughout the organization

2. Bench Marking

3. Economic Value Addition

4. Market Value Addition

5. Employee Value Addition

The non-financial indicators relate to the following functions:

a. manufacturing and production

b. sales and marketing

c. human resouces

d. research and development

e. the environment

f. systems support

Therefore, whether a company is a manufacturer or a service provider, to be successful, its management should ensure that:

a. products move smoothly and swiftly through the production cycle without any interruption or delay;

b. warranty repairs are kept to a minimum and turned round quickly

c. suppliers' delivery performance is constantly monitored

d. quality standards are continually reviewed and upgraded

e. sales orders are effected without backlog

f. customer satisfaction assessment yardsticks are reviewed regularly

g. labour turnover statistics are analysed so as to identify managerial weaknesses

h. R & D costs are kept at reasonable levels

i. the accounting and finance departments understand the needs of business

A representative list of performance measures is given below:

1. Manufacturing and Production Indicators

a. **Production process**

- indicators deriving from time and motion studies
- production line efficiency
- ability to change the manufacturing schedule in line with the changes in marketing plan
- reliability of component parts of the production line
- production line repair record
- keeping failures of finished goods to a minimum
- ability to produce against the marketing plan
- product life cycle
- introducing concepts such as 'kaizan' for continuous improvement in processes

b. **Production quality**

- measurement of scrap
- tests for components, sub-assemblies and finished products
- fault analysis
- "most likely reasons" for product failures
- actual failure rates against target failure rates
- complaints received against the quality assurance testing programme
- annualised failures as a % of sales value
- failures as a % of units shipped
- various indicators of product / service quality
- various indicators of product / service reliability
- going to the extent of 'six sigma' analysis to ensure quality.

c. **External relationships with suppliers**

- inventory levels and timing of deliveries
- "just in time" inventory control measurements
- stock turnover ratio
- weeks stocks held

- suppliers delivery performance
- analysis of stock-outs
- parts delivery service record
- % of total requests supplied in time
- % supplied with faults
- quality and pricing when compared to supplies to competitors from the same sources

d. **Sales delivery and service**

- shipments vs. first request date
- average no. of days shipments delayed
- action taken report on response time between enquiry and execution

2. **Sales and Marketing**

- measurements based on "staying close to the customer"
- complaints rework
- re-packaging / ease of opening
- quality of packaging materials
- customer satisfaction analysis
- price of products comparisons
- unsuccessful visit reports and analysis to find causes & effect remedies
- monitoring repeated lost sales by individual salesmen
- sales commission analysis
- monitoring of enquiries and orders
- sales per 100 customers
- "strike rate" - turning enquiries into orders
- analysis of sales by product line
- by geographical area
- by individual customer
- by salesmen
- matching sales orders against sales shipments - mismatch analysis
- backlog of orders analysis
- flash reports on sales

- publication of sales teams performance internally
- analysis of basic salaries and sales commissions
- share of the market against competitors
- share of new projects in the industry
- new product / service launch analysis
- time to turn around repairs
- delays in delivering to customers and level of customer goodwill
- value of warranty repairs to sales over a period of time

3. **People**

- head count control
- head count by responsibility
- mix of staff analysis
- mix of business analysis vs. staff personnel needs
- skilled vs. non skilled
- management numbers vs. operations staff
- own labour / outside contractor analysis
- workload activity analysis
- vacancies existing and expected
- labour attrition rate
- labour turnover vs. local economy
- % of overtime worked to total hours worked
- absence from work
- staff morale
- cost of recruitment
- number of applicants per advert
- number of employees per advertising campaign
- staff evaluation techniques
- evaluation of staff development plans
- monitoring of specific departments, eg. Accounting
- speed of reporting to internal managers vs. HQ

- accuracy of reporting as measured by misallocations and mispostings
- monitoring of departments performance long term
- pay and conditions vs. competition
- level of motivation and morale
- employee satisfaction index analysis

4. **Research and Development**

- evaluation vs. basic R&D objectives, strategic objectives and project objectives
- product improvement against potential market acceptance
- R&D against technical achievement criteria, against cost and markets
- R&D priority vs. other projects
- R&D vs. competition
- R&D technical milestones
- analysis of market needs over the proposed product / service life of R&D outcome
- top management audit of R&D projects
- major programme milestones
- failure rates of prototypes
- control by visibility - releases, eg. definition release, design release, trial release, manufacturing release, first shipment release, R&D release
- competitor focus and market segment analysis before finalizing on outcome of R&D

5. **Environment**

- work place environment yardsticks
- cleanliness
- tidiness
- pollution and effluent disposal mechanism and effectiveness
- catering facilities vs. competition
- other facilities vs. competition
- compliance with legal requirements
- contribution to society
- education, medical and other facilities provided to the society

SHAREHOLDER IMPACT OF NON-FINANCIAL OBJECTIVES :

The impact of the pursuit of non-financial objectives upon shareholder wealth is not clear cut. There are many writers who would argue that companies which pursue a wide range of objectives find that they create for themselves a very positive public image and this serves to increase shareholder wealth. Others would argue that community type projects simply add to costs and thus erode profit, thereby reducing shareholder wealth. In reality, the truth probably lies somewhere between these two extremes. Carefully selected projects, particularly those which are community related, may well serve as a form of indirect advertising and raise the corporate profile and associated shareholder wealth. Other projects may simply represent a gesture of goodwill, on which no return is either sought or earned.

For example, suppose that a company decides to pursue an image of high product quality as a secondary objective. The aim is clearly non-financial in nature, but it will involve spending money on quality control and management projects which could add to costs and reduce profits. There is substantial research evidence from people like Juran, which suggests that "quality is free". In other words, the gains from higher sales levels and reduced costs of warranty claims exceed the costs of the investment in quality improvements. Where this is the case, then the shareholders actually gain from the fact that the company has chosen to pursue a non-financial objective.

In other cases, the shareholder impact will be much more difficult to identify. Some companies have a very good reputation in terms of the facilities which they provide for employees. Such provision clearly costs money and absorbs funds which could be used elsewhere within a business and so it might be easy to take the view that pursuit of the objective of employee welfare is detrimental to shareholders. In fact, it may work that such policies serve to reduce staff turnover rates and increase productivity. It is quite possible for the aggregate benefits from such a policy to exceed the costs, so that shareholders see profits rise over the longer term. As with many things, whether a strategy has a positive or negative effect depends upon the time frame within which it is being judged.

Financial costs incurred for non-financial aspects such as quality, R&D, employee welfare etc may reduce the bottom-line in profit statements but would in the long run improve shareholder wealth.

The pursuit of non- financial objectives is associated with all types of organisations. To seek non-financial objectives is not to ignore the financial, but merely to acknowledge that no single aim is of overriding importance. At the same time, non- financial objectives do not necessarily conflict with the financial and can in fact serve to prosper the interests of shareholders. A strong public image and good publicity must be important too, including, for example, for the Missionaries of Charity or the Ramakrishna Mission. The difficulty lies in reaching the right balance, which keeps shareholders happy but also allows other interest groups to believe that a company also has their interest at heart as well. The good manager must learn to be good at juggling.

Business Insight

Business insight is the capability of organizing and analyzing financial, operational, and external information, enabling decision-makers to understand and act, before their competitors, to create sustainable shareholder value.

Gone are the days when it was a major exercise for Unilever to identify and assess the performance of the 1,600 brands that comprised its global portfolio. As part of a new corporate growth strategy, the global portfolio has been reduced to 400 key brands, and a new data warehouse has been implemented. Global, regional, and national brand managers now have access to consistent data on sales performance and changes in customer awareness and attitude toward each brand.

This information enables brand management to readily identify when and where to target promotional investments. Procurement directors have access to a rich data set of global vendor spend information upon which to predicate vendor negotiations. Unilever significantly increased the transparency of critical information in the areas of procurement, brand management, customer management, and finance.

The results ? A ∈ 2.1 billion reduction in direct procurement costs, a global view of the health of 400 key brands, and a single view of its most strategic (and most profitable) customers. The company also gained a single-stream reporting process by consolidating three different processes for producing financial, management, and category reports. Now all reports tally, eliminating substantive reconciliation at all levels of the business.

At a time when Unilever needed to boost its share price and profitability, the transformation of its performance reporting capabilities (with Accenture's help) enabled the enterprise to achieve dramatic improvements. During a time of flat industry performance, Unilever realized both top-line growth and increased shareholder value.

(10/1/2003) CFO Project Volume 2 By Paul A.Boulanger, Accenture

5.3 Impact on Investment, Finance and Dividend Decisions

This Section includes :

- **Critical and Growing Need of Investment, Finance and Dividend Decisions**
- **The Continued Evolution and responding to the Challanges**
- **Looking Forward**

INTRODUCTION :

One of the more compelling reasons for companies to actively pursue the development of business performance management capabilities is that technology is now at the stage where it can deliver on the vision promised for years. Integration technologies such as Kalido and Informatica have advanced to the point where they can more easily establish a common performance management language without remediating frontline transaction systems and compromising flexibility at the local business level. Business analytics applications now contain out-of-the-box functionality with the richness to develop metrics management, deliver online self-service reporting, and support an intuitive discovery process through drill-down and information exploration that is useful to frontline managers and executives alike.

CRITICAL AND GROWING NEED OF INVESTMENT, FINANCE AND DIVIDEND DECISIONS :

The need to use performance management information effectively has been articulated for years. However, we are at a pivotal point in the evolution of performance management. It is more critical than ever for enterprises to address these capabilities. Decisions made now, capabilities constructed now, will shape a company's competitive position for years to come.

Why now? Four primary drivers are galvanizing organizations to address their use of information to drive business results. First, most companies have made little progress. Their executives are deeply dissatisfied with their organizations' ability to leverage information for competitive advantage. Second, companies are experiencing unprecedented demands for accountability in the current regulatory and economic environment. They require increased insight into the real drivers of business results. Third, technology is now at the stage where it can deliver on the vision promised for years. And last but not least, their competitors are moving.

Recall the "pep" talk given to the salesmen in the movie Glengarry Glen Ross: "We're adding a little something to this month's sales contest. As you all know, first prize is a Cadillac El Dorado. Anybody want to see second prize? Second prize is a set of steak knives. Third prize is you're fired." The stakes are rising. Being unable to generate the competitive advantages that effective access to information can deliver is an increasingly dangerous position.

Organizations and their executives are deeply dissatisfied with the state of their performance management information capabilities. Corporations are increasingly awash in information, yet continue to struggle in creating real "insight" to drive performance. There are several reasons for this continued struggle. Many companies have implemented enterprise resource planning (ERP) systems in ways that have not facilitated the generation of useful information. Accenture recently conducted a survey of 163 companies that had implemented ERP systems. The mean number of instances (separate and distinct implementations of the same software across regions or business units) was eight, with 32 percent having implemented from six to more than 20 distinct instances. This distributed ERP implementation strategy has resulted in disparate, disconnected sources of operational information.

Further, with the decentralized governance of IT manifest in many companies, individual user groups have driven their own development of data warehouses and data marts, contributing to increased fragmentation of information with little progress toward a "single version of the truth." At some large companies, the data architecture is so fragmented that no one will take accountability. The response is armies of analysts using batteries of spreadsheets, manually generating performance information. The cost of this analyst function within finance alone can exceed 0.5 percent of revenue.

Also propelling the need for business insight is the regulatory and economic environment. Corporations are experiencing unprecedented demand for accountability. The Sarbanes-Oxley Act in the United States is demanding that executives understand exactly what their companies' financial results are saying and communicate these results clearly to the market. The signoff required of U.S. CEOs and CFOs is more than credits and debits. Rather, it is about understanding that reported business results are fairly represented based on personal knowledge. This translates into reporting transparency — being able to explain cause-and-effect relationships behind business results. Further, as markets continue to struggle and the investment environment languishes, companies that can increase the depth of their disclosure will create higher confidence and valuation in the market. According to a variety of analysts, as baby boomers retire and begin consuming their wealth, they will be replaced by a smaller generation, ending a savings and investment bulge. Analysts portend that we will see this in the next 10 years, putting downward pressure on stocks. Falling prices will force companies to provide even more useful information to attract investors.

Lastly, your competitors are moving. Leveraging information to derive business insight is becoming a significant competitive advantage. While there are far more instances of companies that have not made substantive progress than of progressive companies that have developed the capability to leverage information to their advantage, there are examples that should give executives pause:

- A global downstream oil producer was operating in 125 countries with several hundred separate operating companies having their own IT systems and reporting tools. It was unable to report consistent and timely information across operating units. By developing a performance management capability, key management information such as customer profitability could be segmented to support better business decision-making at a country level while enabling data to be aggregated for regional and global

reporting. As a result of improved customer profiling and reporting, the business unit increased its profitability and delivered overall savings of $140 million annually to the parent company.

● Based on this success, the company applied the concept to its retail division, where it was experiencing intense competition for fuel sales and eroding profit margins. Non-fuel sales needed to be increased to generate higher margins and growth. However, disparate IT systems made the company unable to access product performance or category management information. By implementing a common reporting solution, category managers got a standard view of sales from thousands of retail sites. The results revealed that 20 percent of non-fuel items generated 94 percent of sales. Armed with these data, the company achieved a 10-percentage-point increase in non-fuel sales and gross margins.

● In the aftermath of a major acquisition, another global oil producer needed to integrate its existing lubricants business with the newly acquired company. At the same time, it wanted to shift management focus from cost-plus to a value-based approach similar to that used in consumer packaged good companies. By deploying a performance management capability, the company created a common information resource while maintaining regional autonomy for local reporting requirements. A centralized reporting solution was implemented rapidly across the global organization to meet the information requirements of the finance, supply chain, and marketing functions. Web-based tools were used for the business units to submit data and for general administration. Standard and ad hoc reports enabled consistent and comparative analysis of key measures so that the merged business could be managed effectively, both globally and locally. A successful integration of the two businesses after the acquisition realized significant synergy savings.

THE CONTINUED EVOLUTION AND RESPONDING TO THE CHALLANGES :

Companies are coalescing around a vision for management information that has a variety of common elements. Generally agreed-upon characteristics of an effective decision-support capability start with housing information using a common taxonomy at a level of common use. A major chemical company worked to define common units of measure, product codes, customer codes, and other key data elements globally. This enabled the company to define economic value created by products in geographic regions by key customers and by a variety of other dimensions.

The Continued Evolution

Commonality must be supported by processes used to compile information so that it is trusted as accurate. Tight integration with source systems, strong central governance, and internal controls are all part of ensuring that when end users access information, they believe it to be true. Too often, review meetings start with a discussion around the veracity of the performance at hand. Moving up the hierarchy of needs requires organizations to construct information-aggregation processes that ensure integrity. High-integrity information enables an organization to divest of competing sources of the same topical information. Eliminating redundant data

marts and reporting processes ensures that management is working off of a single version of the truth, a critical but elusive capability for many companies.

Lastly, information is aggregated to benefit decision-makers. Given that decision-making happens at all levels of an organization, an effective performance management information environment provides broad access to a wide community of users through self-service and intuitive portals that facilitate the discovery process without extraneous aggregation effort.

Many companies have yet to achieve these basics. However, leading practice continues to evolve. Increasingly, technologies are available that enable companies to leverage information delivery techniques, such as alerts and data visualization, which increase the speed of recognition and assimilation. Companies also are developing performance management capabilities that support a cascading metrics approach; they're hardwiring strategy to operations with information architecture constructed around a common view of how the business is to be managed. Corporate strategy is manifested in how frontline operations are measured. Information is increasingly forward-looking, with everything positioned in terms of where we will be rather than where we have been.

Content is evolving as well. The line is blurring between financial and operational information, embedding in information delivery tools the ability to rapidly derive cause-and-effect relationships between business drivers and business results. No longer is the P&L important; the drivers behind the P&L are what is measured and managed. As information services evolve, the potential to include external information increases, providing both information and context. Managers should feel differently about a 500-basis-point drop in operating margin if they know that five of their top competitors experienced a greater decrease during the same period. The power of infusing a company's internal information with external information that measures shifts in cross-company supply chains, industry direction, and competitors' positions has the potential to be the single biggest evolution in management information since the development of the database (see Figure 1 on the next page).

The ability to leverage information to create insight into business performance will create competitive advantages in cost structure, go-to-market strategy, and supply chain management that separate successful businesses from those getting the steak knives, or worse. Business insight is the capability of efficiently organizing and analyzing financial, operational, and external information, enabling decision-makers to understand and act, before their competitors, to create sustainable shareholder value.

Executives use enhanced information capabilities to add value in all key management processes. Strategic decision-making occurs with more accurate and relevant information. Organizations are better aligned through the communication and monitoring of key value drivers. Product portfolios and profitability are optimized. Customer offerings, product cross-selling approaches, and pricing strategies are tailored according to superior segmentations and analyses of sales information and customer behavior. Marketing effectiveness is improved based on the impact of a customers' lifetime value. Credit policies are better managed on the
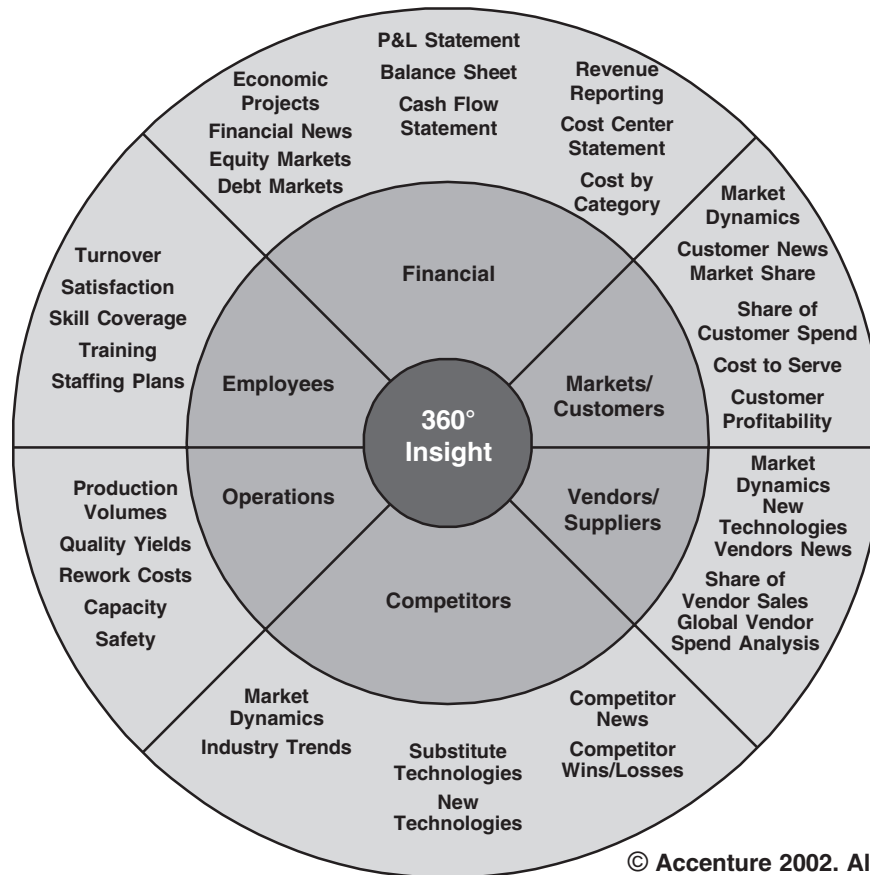
Figure 1: Critical Performance Information Components

basis of customers' total global relationship with the business. Supply chains become more visible, allowing global and regional sourcing strategies to be pursued. Working capital and taxes are minimized and global foreign exchange positions optimized.

Responding to the Challenge

How do companies begin to develop the capability to better leverage information and create competitive advantage? With a focus on business value. The first, and perhaps most important, best practice for achieving business insight is to base the design of business insight capabilities on a rigorous analysis of what drives value in your organization. What information needs to be at the fingertips of decision-makers to keep them better informed, help them make better decisions faster, and to support tactical performance reviews?

In many organizations, technical architecture and data availability determine what information decision-makers have access to. However, the best results are achieved when the decision-makers' information needs drive the information strategy, rather than the information that is readily available to IT. The information needs of critical management processes come first, followed by what content to include (see Figure 2). The process of analyzing your competitors, for example, could include not only the traditional competitive

wins and losses but also market dynamics and industry trends — valuable external information that provides context for future action. The information needs of each management process and the resulting content required drive the most appropriate access and delivery channels and, finally, data management and technical architecture. Value comes first, with technology being an enabler, not a destination.

Management Process Information Needs			
Strategy Development	Product Portfolio Management	Customer Relationship Management	Credit Management
Supply Chain Optimization	Treasury Management	Performance Management	Compliance/Risk Management

Information Content					
Financial	Markets/ Customers	Vendors/ Suppliers	Competitors	Operations	Employees

Information access and Delivery					
Reporting Applications	Analytic Applications	Contextual Information	Visual Presentation	Access/ Distribution	Security/User Categorization

Data Management			
Data Model	Policies and Procedures	Reference Data	Data Retention

Technical Architecture			
Interfaces	Data Population	Storage	Applications

Figure 2: Value-Driven Information Architecture Development

For companies that have yet to develop business insight capabilities, there are a number of responses.

First, respond with urgency. Management needs to take decisive action, making tough decisions, driving development and adoption of a common framework for performance management, isolating those elements that are truly business-unit or region specific, and standardizing cross-company. Demand adherence to a corporate standard and create governance structures to manage data standards, IT development, and other critical success factors.

Second, respond with entirety. Address the entire management cycle. Integrate strategic planning, business planning, and target setting with performance management. Companies must become more disciplined in holding the organization accountable for stated operating objectives and the capability developments associated with investment. This implies that performance management is grounded in targets, plans, and initiatives built into business plans. Companies that develop performance information capabilities divorced from planning processes miss the opportunity to strengthen accountability and focus. Many mid-level managers complain of having to prepare voluminous reports in response to seemingly random corporate queries. If, rather, there is agreement on what will be measured at each level of the organization, and those measures cascade from and relate to the corporate strategy, and

they are the basis for both planning/forecasting and performance reporting, management discussion and query tends to have greater focus and impact, and responses require less organizational effort.

Third, respond with vision. Develop a three- to five-year target information architecture for your business to support decision-makers' information requirements, then be prepared to adapt the plan as the business evolves. Be able to dissect and articulate the plan for various components. Armed with a performance management framework and prioritized view of information, have an end state in mind for how the enterprise will manage data. What will be held consistent corporate-wide rather than allowed to vary by business or geography? How will data ownership be assigned in the organization and what processes are required to maintain quality, controls, and integrity? Have a view as to how legacy applications will integrate with a central data store. What integration technologies will be required? Develop an understanding of what performance management applications will be employed and how they will interact with the data repository. Will you need an activity-based costing engine to derive product and customer profitability, or will more simplistic allocation schemes be employed? How will your planning applications integrate with your performance reporting applications? Have a plan for how information will be distributed throughout the organization. How will standard reporting be automated and pushed out to the organization? How will online analytical processing (OLAP) technologies be employed to streamline and support high-powered analytics? Only by having a vision that informs investment in specific capabilities, coupled with a coherent program that governs project direction toward a common goal, will you create an integrated information architecture that dramatically improves the organization's access to and use of information (see Figure 3).
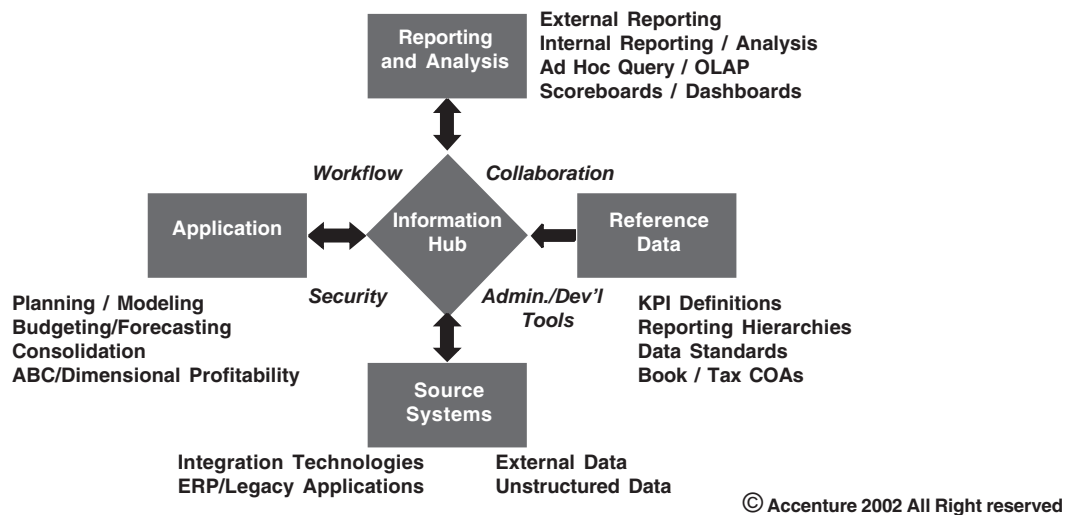
Figure 3: Components of Information Architecture

Lastly, respond with action. Start taking the steps now to move your company in the right direction. A number of short-term actions can be taken to begin developing the competence in managing an enterprise performance information capability.

Begin by moving the organization toward common management metrics and planning processes. Establish corporate key operating metrics. Drive management discussions around

these metrics, and demand that individual components of the business use metrics aligned with the stated corporate metrics. While this concept has been an established leading practice for over a decade, many companies have yet to take this crucial step.

For performance reporting and analytics, determine the most urgent management process information needs and start there. For some organizations, procurement processes yield significant, measurable value from improved information. In the Unilever example, customer and product profitability were determined to be of high value as well. Create a positive case study within a specific management process to serve as an internal reference for the power of improved decision support.

With your data architecture, begin the process of creating a common taxonomy. Start with the most valuable elements, such as customers. Launch projects to standardize data companywide and institute organization control and data ownership. Drive consolidation and rationalization of data stores, controlling the rampant development of data warehouses and data marts. Constrain IT budget expenditures that do not align with the target end state. This may mean forcing individual user groups to postpone the gratification of constructing their one-off reporting tools.

Drive toward an integration standard. Select, pilot, and demonstrate the power of an integration technology. In operational applications, allow for variation across division and geography where required, but control nonessential variation in application development and data structures.

These short-term measures can begin to shift the organization's thinking about the management of information and create the discipline associated with leading practice performance information.

LOOKING FORWARD AT LAST :

For far too long, performance management and reporting has been a backward-looking exercise or a guessing game. Finance executives have analyzed the impact of prior decisions and results to determine how future plans should be developed to improve results or decrease risks. They have monitored trends for key business drivers and attempted to identify the causes of variance in operating performance.

Business insight allows you to look ahead. In the near term, you can easily identify trends, key drivers, and other factors that influence chosen business strategies. You can make capital allocation decisions to develop an investment portfolio aligned with your strategies. Longer term, a robust business insight capability delivers even more, placing CFOs front and center as the chief executive's primary strategy resource. Based on corporate positions and projections of the major factors driving strategy, you can create long-term business strategies. Business insight enables you to choose appropriate industries in which to compete, and it enables you to identify the major factors that will influence your company's ability to grow, compete, and remain profitable. Equally important, you can develop credible early warning systems that identify challenges when company positions are incorrect.

As the chief financial steward of a nimble organization, you will more effectively deliver the critical information that decision-makers and frontline operators need to make faster, more effective decisions. Based on better insight into internal and external business circumstances, your company will understand, act, and prevail, conquering competitors and creating significant (and sustainable) shareholder value.

5.4 Alternative Financing Strategy in the Context of Regulatory Requirements

This Section includes :

- Regulatory requirements whether affect the choice of the Capital Structure
- Reasons for the regulatory requirements in the choice of the Capital Structure

INTRODUCTION :

Regulatory requirements are required to be complied with to ensure that a firm is adequately capitalized to meet multiple objectives. The best example would be the case of banks which accept deposits from the public and deploys the generated funds across various assets like corporate and retail loans. Since public confidence is the foundation for banks survival, regulatory authorities prescribe adequate capital for the banks to be maintained, known as the Capital Adequacy Ratio (CAR).

REGULATORY REQUIREMENTS WHETHER AFFECTS THE CHOICE OF THE CAPITAL STRUCTURE :

Credit risk is the risk of default from the borrowers. Operational risk is the risk of some of the procedures going wrong and market risk is the risk of market volatility affecting the values of banks' investments in various financial assets.

Banks and Financial Institutions

Banks allocate resources across various assets through their lending operations. In the process, banks are exposed to various types of risks which are broadly classified into three types, Credit Risk, Operational Risk and Market Risk. Banks are also expected to comply with the RBI guidelines on the creation of necessary risk management architecture and also the guidelines on Basel II. Capital Adequacy computation has to be done under Basel II requirements effective March 31, 2008.

According to Basel committee norms, banks have to maintain adequate tier I capital as a cushion to take care of all these risks and protect the depositors. Risk is inherent in the nature of the banking business. The Reserve Bank of India prescribes a risk weight for the various assets of a bank like the corporate loans, retail loans and the investments in financial assets like bonds, shares, derivatives etc. Using these weights, the risk weighted assets are computed. Banks have to maintain 10% capital adequacy ratio, which means that the banks tier I capital in the form of equity shares, will go up as the value of risk weighted assets go up. This way the banks depositors are protected. This is an example of how regulatory requirements affect the capital structure of a bank. Insurance companies are also subjected to this kind of capital adequacy ratios. Banks and Non-banking finance companies can raise debt up to 10 times of net worth of the company.

Debt to Equity Ratio prescribed by Banks

Many times banks prescribe the minimum debt to equity ratio for projects to ensure that the promoters bring adequate money as equity contribution. Therefore, when a corporate firm goes for borrowing for a project, it has to bring sufficient equity or deploy the internal accruals to satisfy the requirements of the banks. The following example illustrates this point :

TRISTAR FOODS plc

Input data	Amount (Rs.)
Cost of value machine	150,000
Salvage value of new machine	10,000
Production (lts. Per day)	300
Working days per year	300
Working life of machine (years)	6
Income per lt. (net)	0.80
Salvage value of old machine	5,000
Warehouse cost	15,000
Allocated cost of marketing/year	20,000
Increase in working capital	5,000
Depreciation rate	25%
Corporate tax rate	30%
Capital gains tax rate	30%
Opportunity cost of capital (Debt)	12.5%
Post tax cost of debt	8.8%

ESTIMATION OF CASHFLOWS		Y	E	A	R	S	
	0	1	2	3	4	5	6
Cost of new machine	(150,000)						
Salvage value (old machine)	5,000						
Change in working capital	(5,000)						5,000
Salvage value (new machine)							10,000
Revenue		72,000	72,000	72,000	72,000	72,000	72,000
Depreciation		(37,500)	(37,000)	(37,000)	(37,000)		
Ebit		34,500	34,500	34,500	34,500	72,000	72,000
Ebit *(1-T)		24,150	24,150	24,150	24,150	50,400	50,400
Opearting cash flow		61,650	61,650	61,650	61,650	50,400	50,400
Capital gains tax	(1500)						(3,000)
Warehouse cost		(15,000)	(15,000)	(15,000)	(15,000)	(15,000)	(15,000)
Cashflows	(151,500)	46,650	46,650	46,650	46,650	35,400	47,400

Npv	1,17,900
Irr	19.83%

- The above example, as discussed earlier, shows the cash flows for a project with NPV and IRR.
- What should be the amount of debt and equity for this project which requires 150000 as investment?
- A bank may decide to fix the debt that they are willing to lend to this project based on the debt service coverage ratio. Debt service coverage ratio is computed as follows:
- (Net operating profit before long term interest and depreciation and after tax)/ (Instalment + long term interest)
- Debt service coverage ratio protects the annual amount due to the lender namely the interest and instalment amount. There has to be adequate coverage for this say about 2.0 times.
- Let us say that the bank prescribes an average debt service coverage ratio of 2.5 times for this project and wants to know how much of debt it can finance and how much of equity the promoter has to bring in

=Nopat+Depreciation	61650	61650	61650	61650	50400	50400	
Instalment + Interest on term loan	23159	23159	23159	23159	23159	23159	
DSCR (times)	2.66	2.66	2.66	2.66	2.18	2.18	2.50

- The table above shows the debt service coverage ratio and the average debt service ratio for all the years which is 2.5. This means how much of debt is shown in the following table :

Total investment		150000
Debt	1.67	1.00
Debt	93881.33	
Equity	56118.67	
Instalment amount		
Debt	93881.33	
Interest	0.13	
Term	6.00	
Instalment amount		23158.63

- This table shows that a debt equity ratio of 1.67 will be optimum to support 2.5 debt service coverage ratio. This means that the bank will lend 93881.33 and the promoter has to bring 56118.67. Of course, generally the amounts would be rounded off to nearest reasonable lacs for ease of accounting.

REASONS FOR THE REGULATORY REQUIREMENTS IN THE CHOICE OF THE CAPITAL STRUCTURE :

The recent gloom of global economic slowdowns and the failure of corporate governance has created threat to the Indian economy and the investors' trust on corporate sector is at stake. However timely action by the Government by extending several stimulus packages and incentives to create demand and regain confidence of the public & appropriate action by the Government in the Ministry of Corporate Affairs have saved the image of the systems and regained the faith of the stake holders.

Despite a political vision, well articulated schemes and adequate funding, many major programmes are not on schedule. And the benefits are not reaching the intended beneficiaries. This trend ought to be reversed through better organization, better transparency, better feedback and better visibility of timely actions through purposeful auditing of social cost and benefit to achieve growth.

In India, the importance of competition policy and related regulatory regimes has increased greatly since 1991 when a massive wave of liberalization eliminated many controls on investment, capital market, foreign trade and prices. While regulation has significant relevance in the current economic scenario, cost data fed regulatory issues are also many and worth considering. While examining the relevance and usefulness of cost data of companies for tariff fixation/approvals in public utilities like electricity, for ensuring objective subsidy policy, to ensure operational regulation within competitive practices are some of the areas that would require adequate cost audit mechanism as these factors are not addressed in financial reporting mechanism.

In the social sectors like; healthcare and education which are soft infrastructural issues for economic growth, the need for regulation is strongly felt. Strict regulation of the healthcare services is the need of the hour. The fee structures at private healthcare centers need to be formalized and monitored to prevent exploitation of the patients. The National Knowledge Commission has also highlighted that the barriers and quality, cost & content of the higher education needs to be addressed.

Inventory Valuation

Inventory plays a vital role in assessing the true profits of the company. Inventory is one of the important constituents of the Current Assets of the Company. Inventory Valuation is reflected in the Balance Sheet based on the certificate issued by the management. Although the choice of technique for closing inventory valuation does not change the economic reality of events that have occurred, but their effect on taxes and retained earnings go a long way in influencing net income and its distribution as return to shareholders. Stock volatility and ratio of stock to earnings indicate the continued vulnerability of the inventory valuation issue towards manipulation.

In this context it may be mentioned here that as per SEBI circular on clause 49, one of the role of the Audit Committee is to review the annual financial statements and major accounting entries involving estimates based on the exercise of judgment by management before submission to the Board. In almost all the companies, Inventory values are certified by the management.

Corporate Governance

In the context of the recent financial fraud in the corporate sector it is felt necessary that the existing provisions of financial reporting have not fully met the needs of the stakeholders and there is an urgent need to amend the provisions of Clause 49 to regain the diminishing public confidence in Financial Reporting. It is also observed that almost all the failures are the result of the combined effect of failure in business, failure in governance and failure in reporting. As an entity moves closer to business failure the incentive to distort reporting increases and therefore the chances of reporting failure increases.

Transfer Pricing

It may be mentioned here that as per SEBI circular on Clause 49, one of the role of the Audit Committee is to review the disclosure of related party transactions before submitting the statements for board approval. The Explanation to this also talks about related party transactions as defined in the Accounting Standard 18 of ICAI.

Under the present Accounting Standard-18, the Companies have to disclose the related party transactions in the financial results but it does not reveal whether the principle of Arms Length has been followed or not for pricing of their products.

A sound or appropriate capital structure should have the following features:

- Profitability: the capital structure of the company should be most advantageous. Within the constraints, maximum use of leverage at a minimum cost should be made.

- Solvency: the use of excessive debt threatens the solvency of the country. To the point debt does not add significant risk it should be used, otherwise, its use should be avoided.

- Flexibility: the capital structure should not be inflexible to meet the changing conditions. It should be possible for a company to adapt its capital structure with a minimum cost and delay if warranted by a changed situation. It should also be possible for the company to provide funds whenever needed to finance its profitable activities.

- Capacity. The capital structure should be determined within the debt capacity of the company, and this capacity should not be exceeded. The debt capacity of a company depends on its ability to generate future cash flows. It should have enough cash to pay creditors fixed charges and principal sum

- Control: the capital structure should involve minimum risk of loss of control of the company. The owners of a closely-held companies are particularly concerned about dilution of control.

5.5 Modeling and Forecasting Cash Flows and Financial Statements

This Section includes :

- **Modeling Cash Flows**
- **Interpretation of Financial Statements**

INTRODUCTION :

Financial strategy requires knowledge of alternatives available. The alternatives have to be each with different new aspect adding value to the proposition. A robust financial model that can facilitate exploration of the consequences of the various alternative choices will be most useful for a finance manager to quickly understand the implications of increasing debt to equity ratio, or a change in tax structure and how it affects the earnings per share or any other chosen objective.

MODELING CASH FLOWS :

Modeling can be best explain with the help of the illustration.

The illustration given below shows how a given set of assumptions can be used to model for forecasting cash flows, financial statements and valuation of the firm

Sales growth	10%					
Current assets/Sales	15%					
Current liabilities/Sales	8%					
Net fixed assets/Sales	77%					
Costs of goods sold/Sales	50%					
Depreciation rate	10%					
Interest rate on debt	10.00%					
Interest earned on cash and marketable securities	8.00%					
Tax rate	40%					
Dividend payout ratio	40%					
Year	**0**	**1**	**2**	**3**	**4**	**5**
Income statement						
Sales	1,000	1,100	1,210	1,331	1,464	1,611
Costs of goods sold	(500)	(550)	(605)	(666)	(732)	(805)
Interest payments on debt	(32)	(32)	(32)	(32)	(32)	(32)
Interest earned on cash and marketable securities	6	9	14	20	26	33
Depreciation	(100)	(117)	(137)	(161)	(189)	(220)
Profit before tax	374	410	450	492	538	587
Taxes	(150)	(164)	(180)	(197)	(215)	(235)
Profit after tax	225	246	270	295	323	352
Dividends	(90)	(98)	(108)	(118)	(129)	(141)
Retained earnings	135	148	162	177	194	211

INTERPRETATION OF FINANCIAL STATEMENTS :

This part shows the projected income statement based the basic assumptions. These assumptions can include capital structure changes like debt, equity, leasing etc.

Balance sheet						
Cash and marketable securities	80	144	213	289	371	459
Current assets	150	165	182	200	220	242
Fixed assets						
At cost	1,070	1,264	1,486	1,740	2,031	2,364
Depreciation	(300)	(417)	(554)	(715)	(904)	(1,124)
Net fixed assets	770	847	932	1,025	1,127	1,240
Total assets	1,000	1,156	1,326	1,513	1,718	1,941
Current liabilities	80	88	97	106	117	129
Debt	320	320	320	320	320	320
Stock	450	450	450	450	450	450
Accumulated retained earnings	150	298	460	637	830	1,042
Total liabilities and equity	1,000	1,156	1,326	1,513	1,718	1,941

This part shows the projected balance sheet based on the earlier assumptions

Year	0	1	2	3	4	5	
Free cash flow calculation							
Profit after tax		246	270	295	323	352	
Add back depreciation		117	137	161	189	220	
Subtract increase in current assets		(15)	(17)	(18)	(20)	(22)	
Add back increase in current liabilities		8	9	10	11	12	
Subtract increase in fixed assets at cost		(194)	(222)	(254)	(291)	(333)	
Add back after-tax interest on debt		19	19	19	19	19	
Subtract after-tax interest on cash and mkt. securities		(5)	(9)	(12)	(16)	(20)	
Free cash flow		176	188	201	214	228	

Valuing the firm

Weighted average cost of capital	20%					
Year	**0**	**1**	**2**	**3**	**4**	**5**
FCF		176	188	201	214	228
Terminal value						2,511
Total		176	188	201	214	2,740
NPV	1,598	<— =NPV(B56,C61:G61)				
Add in initial (year 0) cash and mkt. securities	80					
Enterprise value	1,678					
Subtract out value of firm's debt today	-320					
Equity value	1,358					

- The third part of the model shows how from the projected income statement and balancesheet, one can arrive at the free cash flows to value the equity of the firm

- This model can be subjected to sensitivity analysis, scenario anlaysis and simulation for quantifying risk and generating control parameters.

5.6 Sensitivity Analysis for Changes in Expected Values in the Models And Forecasts

This Section includes :

- Sensitivity Analysis, Cost of Capital and NPV
- Emerging Trends in Financial Reporting
- Financial Reporting Supply Chain

INTRODUCTION :

Sensitivity analysis refers to studying of the impact of changes on one or more variables on the results, which can either be NPV or IRR or EPS etc. This will help in understanding the critical variables on which the results depend. It is also one way of understanding the risks related to a project or policy. The following illustration shows how sensitivity analysis can be performed on a model of projected cash flows for capital budgeting.

Sensitivity analysis helps in decision making. When a project proves to be very sensitive to certain aspects such as raw material price, power cost, selling price etc the management has to provide adequate weightage to these aspects before the investment decision is frozen.

SENSITIVITY ANALYSIS, COST OF CAPITAL AND NPV :

The lending institutions also heavily depend on this analysis before they decide on lending quantum or lending itself. If a project is very sensitive to some parameters and if the lender perceives them as critical, the decision of lending is based very much on that.

Illustration of sensitivity analysis- Cost of capital and NPV

	Sensitivity analysis Cost capital and NPV	
	563.86	
0.15	563.86	
0.20	450.76	
0.25	358.40	
0.30	282.12	
0.35	218.46	
0.40	164.84	
0.45	119.28	

- The above table shows the impact of cost of capital on the NPV of the project. It shows that even if the cost of capital becomes 45%, the project is viable and shows a positive NPV

Illustration of Capital expenditure, NPV and IRR

	Sensitivity analysis Capex, NPV and IRR	
	563.86	63%
280	562.51	62.97%
300	549.02	59.66%
350	515.32	52.66%
400	481.61	47.00%
450	447.90	42.33%
500	414.20	38.39%
800	211.96	23.35%
1000	77.13	17.54%
1200	-57.70	13.36%

- This table shows the impact of capital expenditure changes on the results of the project namely the NPV and IRR
- It can be seen that the NPV turns negative only when the investment touches 1200

Capital expenditure and cost of capital on NPV

Sensitivity analysis-Capex, Cost of capital and NPV					
563.9	0.2	0.2	0.3	0.3	0.4
280.0	562.5	449.3	356.9	280.6	216.9
300.0	549.0	435.0	341.9	265.0	200.8
350.0	515.3	399.1	304.3	226.0	160.7
400.0	481.6	363.3	266.7	187.0	120.5
450.0	447.9	327.4	229.1	148.0	80.4
500.0	414.2	291.5	191.5	109.0	40.3
800.0	212.0	76.3	-34.0	-124.9	-200.6
1000.0	77.1	-67.1	-184.4	-280.9	-361.1
1200.0	-57.7	-210.6	-334.7	-436.8	-521.6

- This table shows the impact of cost of capital and capital expenditure on the NPV of the project. It can be seen that at 1200 capital expenditure and a cost of capital of 20%, the project becomes unviable. This will help in controlling the variables, namely cost of capital and capital expenditure with in certain boundaries so that the project doesn't become unviable.

The ratios after sensitivity and before sensitivity such as IRR and ROCE would indicate the level of sensitivity :

Data							
Cost of capital	15%						
Tax rate	35%						
Capital Expenditure	278	million					
Salvage value	30%	(percent of capital expenditure)					
Year	0	1	2	3	4	5	6
Price per unit		250.00	250.00	230.00	225.00	225.00	210.00
Volume(in million)		1.20	2.10	3.00	3.00	2.20	1.40
COGS(per unit)		80.00	80.00	70.00	70.00	70.00	85.00
SG & A(in million)	15.00	15.75	16.75	18.00	19.25	20.50	22.00
Depreciation(%)		20.00%	32.00%	19.20%	11.52%	11.52%	5.76%
Wcap/Forward revenue(%)	9.00%	9.00%	8.00%	7.00%	7.00%	7.00%	
Derivations							
Annual Depreciation		55.60	88.96	53.38	32.03	32.03	16.01
Accumulated Depreciation		55.60	144.56	197.94	229.96	261.99	278.00
Book value	278.00	222.40	133.44	80.06	48.04	16.01	0.00
Working capital	27.00	47.25	55.2	47.25	34.65	20.58	0.00
Salvage value							83.40
Cash flow template							
Revenue		300.00	525.00	690.00	675.00	495.00	294.00
COGS		-96.00	-168.00	-210.00	-210.00	-154.00	-119.00
SG & A(in million)	-15.00	-15.75	-16.75	-18.00	-19.25	-20.50	-22.00
Depreciation		-55.60	-88.96	-53.38	-32.03	-32.03	-16.01
Profit on sale of assets							83.40
Taxable income	-15.00	132.65	251.29	408.62	413.72	288.47	220.39
Tax	5.25	-46.43	-87.95	-143.02	-144.80	-100.97	-77.14
NOPAT	-9.75	86.22	163.34	265.61	268.92	187.51	143.25
Depreciation		55.60	88.96	53.38	32.03	32.03	16.01
Salvage value							-83.40
Operating Cash flow	-9.75	141.82	252.30	318.98	300.95	219.53	75.86
Change in working capital	-27.00	-20.25	-7.95	7.95	12.6	14.07	20.58
Capital Expenditure	-278.00						
Cash from asset sale							83.40
Free cash flow	-314.75	121.57	244.35	326.93	313.55	233.60	179.84
NPV	563.86						
IRR	63%						

- The above financial model shows all the assumptions, derivation of cash flows and the results namely the NPV and IRR, in the context of a capital budgeting project

- This can be a good practice exercise for students in excel

EMERGING TRENDS IN FINANCIAL REPORTING :

The Actual State vs. the Desirable State

Management Information System (MIS) has gained tremendous importance over a period of time in the world of corporate finance. In the past, thick monthly reports to management were the norm. There are still some companies who believe in quantity over quality. In many companies, managers and executives are drowning in data. The finance team foists reams of information on them every month, churning out huge reports stuffed with rows and columns of numbers. It is like a data dump.

Finance executives basically report everything, giving other executives 40 or more PowerPoint slides, full of tables, thousands of numbers, and expecting them to pick out key messages and key information. It is generally too much to take on board.

The internal reporting process needs to be overhauled, stripping out "irrelevant" details to focus on "what really drives the business." The need of the hour for the corporate analysis team is to produce a slim booklet and the data contained inside more focused, more graphical and more colorful, with major deviations against budgeted targets marked in green (favourable) and red (adverse). The non-financial data and reports should include metrics on operational efficiency and customer satisfaction, along with progress updates on groupwise initiatives such as the implementation of Customer Relationship Management (CRM) software and supply chain rationalization, among other things.

If this kind of more streamlined, targeted way of reporting is practised, management committee and board meetings will be more productive. The top management can focus not only on understanding and highlighting the relevant issues, but can also discuss the action plan.

Ultimately, organizations should adopt a more "interactive" model of management reporting. They should move financial data out of the general ledger into a data warehouse, putting the onus on managers and executives themselves to sift the data and create their own customized reports and "what if" analyses. That way, all that will be left to be circulated on a monthly basis will be a standard top layer of information — "the bare essentials."

This vision is shared by plenty of finance executives around the world. Many, in fact, have already spent time and money addressing it, investing in business intelligence or performance management software from the likes of Cognos, Hyperion and SAS. "By giving managers the option of access to much more data on their own systems, you don't have to have such a voluminous package on a monthly basis," says Daniel Bednar, deputy CFO of Bureau Veritas, a €1.4 billion inspection and testing agency based in Paris, which rolled out a SAS Information Delivery Portal in 2001.

"The role of finance should not be simply to consolidate and report the numbers, but to help people understand what is going on in the business and make the right decisions".

Information Overload

Of course, improving decision-making is the raison d'etre of management reporting. As a core competence of the finance division, it is up at the top along with matching costs against revenue and ensuring that taxes are paid.

However, it is surprising how often the process goes awry. Once companies have gone though improvements such as standardizing data, for example, by agreeing simple definitions of operating profit throughout the group, many stop there and end up producing monthly reports that are mere "memorandums of data".

Even with the recent proliferation of software tools that allow managers to do much of the number crunching themselves, management reports remain stubbornly thick and unwieldy. According to a survey of 400 large companies worldwide undertaken recently, finance teams report an average of 132 metrics to senior management each month. That is far too many. "Most management reporting has become a function of the data that is available, rather than the information that is actually needed".

What's more, such reporting tends to put too much emphasis on historical financial performance: in the sample cited above, 83 metrics were financial and 49 operational. The preponderance of financial measures is to be expected as it is what finance understands best and what it's most comfortable with. But that doesn't necessarily help managers who could use better insights into trends and exceptions within their businesses. In addition, the cost of preparing, analyzing and checking this information is often a major burden on finance.

The reporting also has to be standardized for a time period and the reporter/ reportee link also to be properly established. Too much of tinkering and doing it too frequently would defeat the whole purpose.

Even with this push to pare down data and to give managers the ability to produce their own reports, monthly reporting won't become extinct. There will always be a need for actionable, summary-level information.

The summary of a report titled "Financial Reporting Supply Chain", brought out recently by the International Federation of accountants is quite illuminating and is appended at the end of the chapter.

The Numbers Game

An Example of Unilever

This the reason, for example, why the finance team at Unilever are making efforts to cut down the volume of data produced, while putting more weight on forward-looking internal and external metrics such as regional sales forecasts, market share, competitor pricing and broader economic indicators. They have pioneered this new approach to support their growth agenda while giving the executives interactive analysis capabilities, providing a common approach to financial analysis and also communication.

Unilever used a tool from a U.K. vendor, Metapraxis, Empower.NET, now, each month the managing director and CFO of each country receive a simple, ten slide executive summary that doubles as an interactive dashboard, through which information can be filtered and personalized. What was once a thick, static batch of reports is now stated to be lean and dynamic. It has become a one-stop shop for information, a way for senior managers to find all relevant strategic and tactical information in a standardized format.

There have been other benefits too, not least in speed — consolidated regional data is now reported up to group level in four days, down from eight — and the information gathering burden on the regional finance staff is lighter.

An Example of Magyar Telekom

When it comes to the distillation of key performance data, however, few finance executives can match the record of Klaus Hartmann, CFO of Magyar Telekom, the HUF604 billion ($2.92 billion) Hungarian telecom firm formerly known as Matáv.

Like its parent, Deutsche Telekom, the company uses SAP's Business Information Warehouse, the data warehousing core of mySAP Business Intelligence, that enables managers to process large amounts of operational and historical data according to their own needs. But that wasn't installed until January of this year. When Hartmann arrived at the firm in November 2000, finance was going to town with a string of hefty, standardized reports. Complaints from the executive committee soon echoed in his ears. " 'We're being killed by too many reports,' they told me. 'It's hard to read them all and find which ones are essential.' "

So Hartmann set himself an ambitious target: to condense key monthly financial and non-financial data into a single sheet of double-sided A4 paper. For a while the experiment succeeded, but after a few complaints of strained eyes Hartmann relented, switching to a three-page summary using a larger type size. The document includes income statements for all four lines of business — fixed line, mobile services, data services and internet services — showing variance against forecasts; a group cash flow statement; a full capex breakdown; and key operational data such as tariffs and minutes of usage. In PowerPoint format, the presentation runs to around a dozen slides, but the three-page hard copy is still in use today, despite a groupwide move away from paper-based reporting. As Hartmann observes, "some people like to have something in their hands, a document they can leaf through."

FINANCIAL REPORTING SUPPLY CHAIN :

In recent years, there have been significant efforts to change and improve financial. What is the result of these change? Has the financial reporting process become better or worse ? Have the financial reports become more or less relevant, reliable and understandable ? What should be done next? The International Federation of Accountants (IFAC) commissioned an independent global survery of the participants in the financial reporting supply chain to get feedback on these questions. In June and July 2007, the survey group conducted a global survery that yield 341 responses from around the world and from all parts of the financial reporting supply chain, including users, preparers, auditors, standard setters and regulators. The survey group also conducted 25 telephone interviews from August to October 2007. This report is based on the findings of global survey and interviews, as well as on additional research.

Paricipants in the survey and interviews were asked about their opinions on four areas of the financial reporting supply chain : Corporate governance, the financial reporting process, the audit of financial reports and the usefulness of financial reports. Below is a brief overview of the findings that are discussed in more detail in the report.

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Survey Results on Corporate Governance

Corporate governance has improved and the balance between coats and benefits has become better.

Positives

- Increased awareness that good governance counts
- New codes and standards
- Improved board structure
- Improved risk management and internal control
- Increased disclosure and transparency

Areas of Concern

- Governance in name but not in spirit
- Development of a checklist mentality
- Over regulation
- Personal risk and liability for directors and management

Further Improvements

- Continue to focus on behavioral and cultural aspects of governance
- Review existing rules
- Further improve quality of directors
- Better relate remuneration to performance
- Expand view from compliance governance to business governance

Survey Results on the Financial Reporting Process

The financial reporting process has improved and the balance between costs and benefits is about the same.

Positives

- Convergence to a single set of global financial reporting standards
- Improvement to regulation and oversight
- Board of directors/management taking ownership of financial reporting.
- Improved internal control over financial reporting systems
- Improved technology for preparing financial reports.

Areas of Concern

- Transition to International Financial Reporting Standards (IFRS)
- Complying/reconciling accounts to different financial reporting standards
- Complexity of financial reporting standards
- Liability restricting process.

Further Improvements

- Continue convergence to one set of financial reporting standards
- Simplify and clarify financial reporting standards – more principles and fewer rules.
- Ensure that boards of directors pay attention to the quality of financial reports
- Provide additional education and training for prepares.

Survey Results on the Audit of Financial Reports

The audit of financial reports has improved and the balance between costs and benefits is about the same.

Positives

- Improved auditing standards and processes
- Increased awarencess, commitment and competence of auditors and audit committees
- More risk-focused audits
- Greater auditor independence
- Improved quality review and auditor oversight

Areas of Concern

- Reduced scope for professional judgment
- Overregulation
- Liability fear leading to boilerplate audits and lack of innovation
- Limited auditor's communication with external stakeholders
- Limited choice of audit firms
- Increased audit cost relative to perceived benefits

Further Improvements

- Cotinue to focus on independence, objectivity and intetgrity
- Converge to one set of global, principles-based auditing standard over time
- Ensure consistent use of audit standards and safeguarding of quality within audit firms
- Improve auditor's communication, both internally and externally
- Consider limited/proportionate liability for auditors
- Remove barriers that limit choice of auditor

Survey Results on Usefulness of Financial Reports

The relevance and reliabitity of financial reports have improved, but the understandability of financial reports has not improved. Respondents preferred annual reports to real time or monthly information, found analyst presentations useful, and would like to have more business-driven information. The survey also showed mixed results about the usefulness of XBRL. In addition, paper financial reports remain useful.

Positives

- Better financial information due to improved standards, regulation and oversight
- More disclosure and comparability in financial reports
- Improved reliability
- Increased emphasis on narrative reporting
- Easier access to financial information

Areas of Concern

- Reduced usefulness due to complexity
- Focus by companies on compliance instead of essence of the business
- Regulatory disclosure overload
- Use of fair value
- Difficult and often changing financial reporting standards
- Lack of forward looking information

Further Improvements

- Improve communication within the financial reporting supply chain
- Include more business-driven information in financial reports
- Better align internal and external reporting
- Improve users access to electronic data, for example, XBRL.
- Encourage short-form reporting focusing on the material issues

Next Steps

The results of this surveys are clear. Participants feel that the three key areas of the financial reporting supply chain-corporate governance, the process of preparing financial reports and

the audit of financial report-have clearly improved in the last five years. Unfortunately, however, they do not feel that the products of this supply chain the financial reports, have become more useful to them. To resolve this situation, there needs to be continuing effort made by all participants to discuss and debate the purpose and objectives of financial reporting so that the information that is reported best suits the information needs of the wide range of users.

Better Performance Reporting and Analysis

Increasingly, finance and business unit managers are seeking to respond to threats and opportunities more quickly and to reallocate resources more authoritatively and dynamically.

A forward-looking and analytical view — the ability to conduct what-if analyses, for example — goes to the heart of much of what finance and business unit managers need to manage their companies amid increasing competition, regulatory oversight, and higher investor and board expectations. Executives need to be able to report timely, accurate data on historical performance, to be sure.

Increasingly, however, finance and business unit managers seek to respond to threats and opportunities more quickly and to reallocate resources more authoritatively and dynamically.

In this study, we sought to explore finance executives' views on their ability to report and analyze financial information. What do their companies do well? Which stakeholders are well- or ill-served with information and analysis tools? And what barriers do companies face when trying to improve their financial reporting and analysis capabilities?

In addition, we wanted to understand how executives' views on these and other matters vary according to their companies' strategy for finance systems technology — that is, do companies that have invested aggressively have different views on their ability to gather, report, and analyze information?

To gauge finance executives' opinions on these topics, CFO Research executed an electronic survey to readers of *CFO* magazine in November 2005. Our research program gathered a total of 164 responses from senior finance executives — more than half of whom work for companies with $1 billion or more in annual revenue. Our solicitation to participate in the survey was focused on senior finance executives and, as a result, respondents' titles are typically chief financial officer (30 percent), vice president or director of finance (33 percent), and controller (16 percent). Respondents come from a broad cross-section of industries, with the manufacturing, financial services, consumer products, and wholesale/retail trade industries particularly well represented.

Queried on their satisfaction with the ability of their finance teams to execute a list of reporting and analysis activities, senior finance executives say they are broadly satisfied with their teams' performance. 86 percent of respondents are somewhat or very satisfied with their transaction-processing capabilities, and nearly 80 percent of respondents express this view of their external reporting and regulatory compliance capabilities. It seems clear from this data that companies' investments over the last several years in basic financial management technology and process improvements have paid off.

But management reporting and the elements most closely tied to a company's ability to plan and execute company strategy are rated less favorably by survey respondents. As shown in Figure 1, respondents express greatest dissatisfaction with their abilities to plan, budget, and forecast, to conduct ad hoc analyses, and to support business decisions such as M&A restructuring, product pricing, and so on.

These results are wholly in line with recent trends in finance and in business more generally, as companies have responded to the pressure of heightened regulatory scrutiny and higher investor expectations by investing heavily in transaction processing, basic consolidation and reporting, and compliance technology and systems.

Figure 1 Forward-looking, analytical view is rated most poorly by senior finance executive.

How satisfied are you with your finance team's ability to execute these core finance activities?

Dissatisfaction with execution
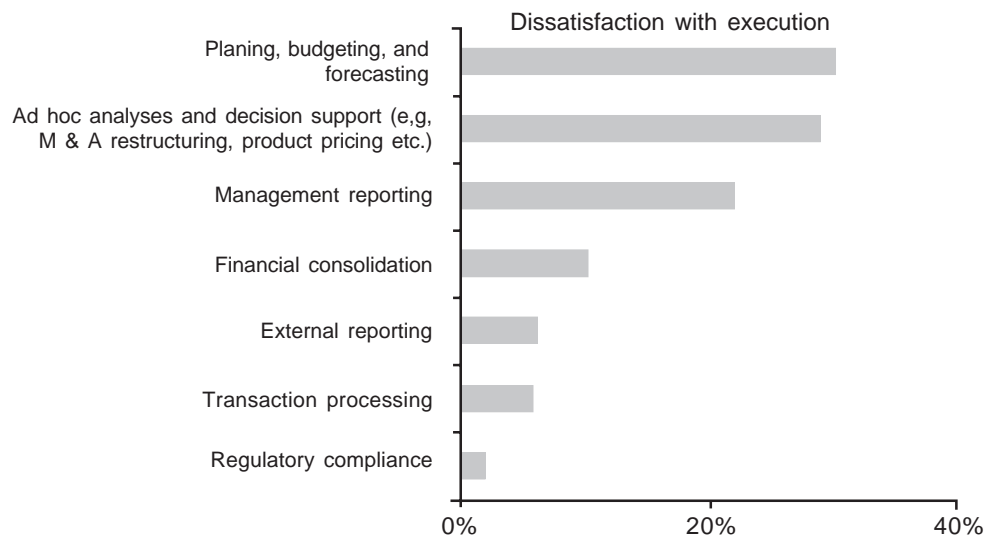
(Percentage of respondents choosing "some what dissatisfied" or "very dissatisfied" on it satisfaction scale)

Companies may well be taking on sophisticated information and analysis initiatives in stages, investing first in systems and processes for historically oriented reporting activities and postponing investments to support forward-looking activities such as planning, budgeting, and forecasting, ad hoc decision support, and internal reporting to decision makers.

Survey data on stakeholders' satisfaction with their access to timely and accurate performance data shows, on one hand, a largely satisfied community of investors, executives, and managers within finance and business units. More than 70 percent of top executives and external users of company performance information are somewhat or very satisfied with their ability to get timely and accurate performance data, say survey respondents (see Figure 2).

Figure 2. Those closest to doing analytical work and making operating decision are least satisfied with their access to Information.

How satisfied are the following stakeholders with your company's ability to provide timely, accurate, reliable information on business performance ?
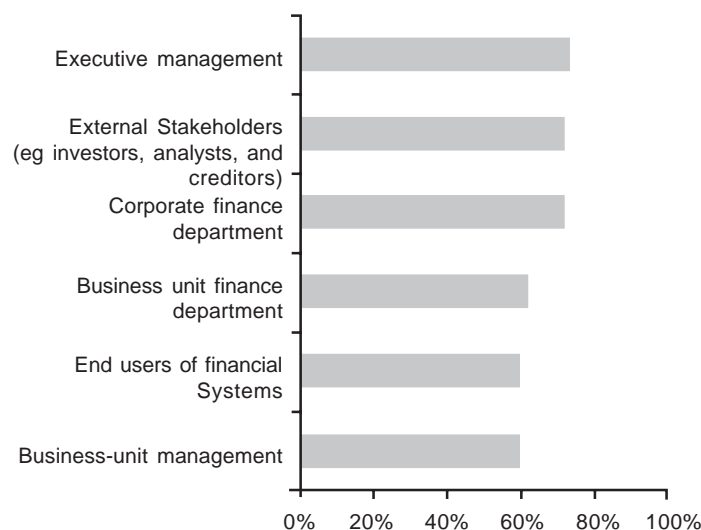
(Percentage of respondents choosing "somewhat satisfied or very Satisfied on 1-5 satisfaction scale)

Less satisfied, says the survey data, are those who rely on such information — and seek to build on it with additional analysis — to make day-to-day operating and investment decisions. Financial systems end users and the finance and general management teams of business units are consistently less satisfied with their access to high-quality information. Thus, those who are most likely to be called on to work with information to create plans, make decisions, and do other analytical work — rather than reviewing the work of others — are least satisfied with the information at their disposal.

In an effort to understand which pieces of management reporting and analysis are most in need of improvement, we asked finance executives to rate how well their processes and systems equip them to meet a broad array of reporting and analysis objectives. A majority of survey respondents say their processes and systems to allow what-if scenario analysis and to give end users flexible desktop access to additional information needs improvement (see Figure 3). Tools for static reporting on business performance and even on line-item details in budgets and results were rated more favourably.

Figure 3. Dynamic use and analysis of performance Information requires improvement more often than static reporting capabililies

How well do your processes and technology support the following management reporting objectives?
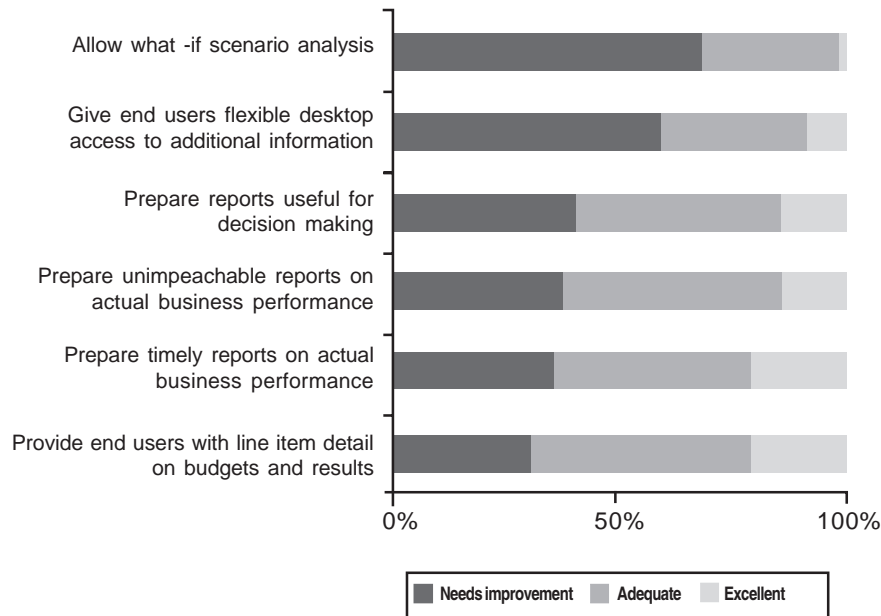
(Percentage of respondents)

In a separate question on broader finance system issues — including security and access privileges and performance tracking against plans — analytical, ad hoc analysis capabilities emerged again as a source of dissatisfaction. While a majority of respondents say their systems maintain suitable security and 44 percent give high ratings to their control over end-user access, a solid majority give poor performance ratings to both their what-if analysis capabilities and to their access to non-financial performance information (see Figure 4).

Figured 4. Tools and information required for day- to-day decision making are rated poorly

How well do your processed Systems, support the following activities ?
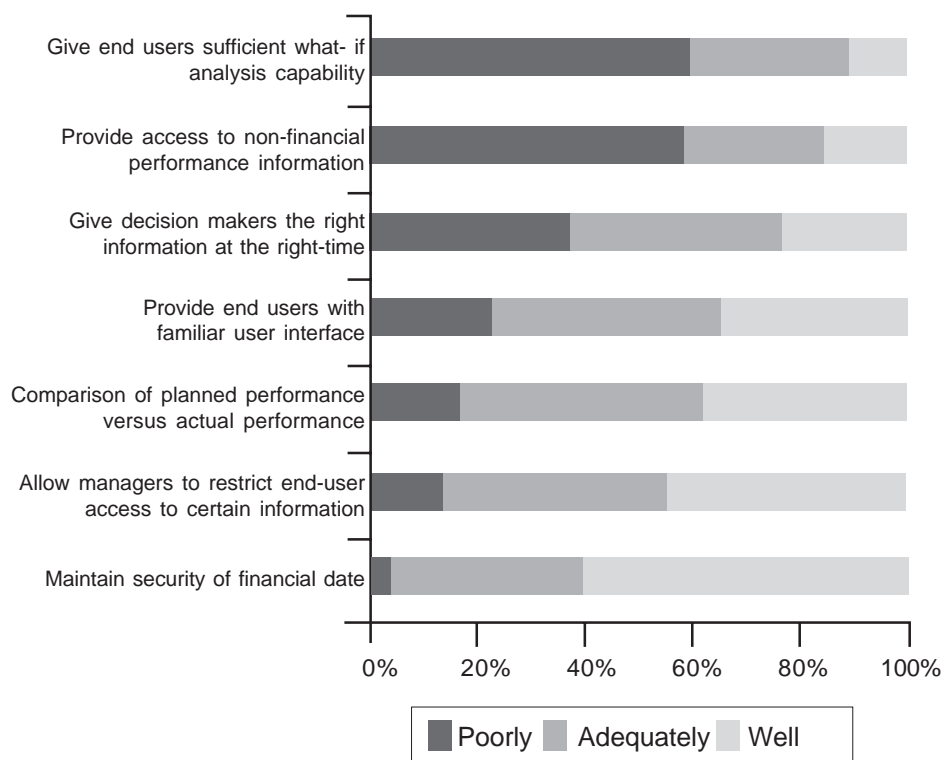
(Percentage of respondents)

A majority of respondents call for improving the timeliness of information, and more than one-third say broader sources of information (that is, more types of information) is a top area for improvement that would deliver business benefit (see Figure 5). But respondents' call for easier analysis again comes through loud and clear in the data, as 71 percent say improving the ease of analysis of their performance data would yield the greatest business benefit.

Figure 5. Better analysis tools yield business benefit.

In your opinion, improving which two of the following attributes of your Company's financial information would yield the greatest business benefit?
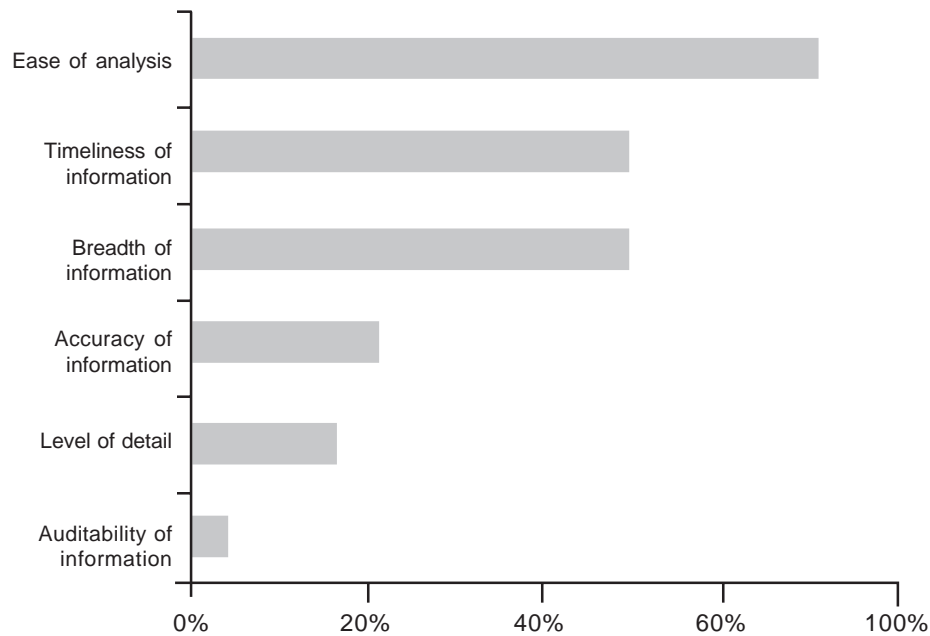
(Percentage of respondents; respondents were allow to choose two items)

Transparency is Everyone's Responsibility

From the University of Virginia: Both finance and non-finance executives learn that ''the better the financial reporting, the better the valuation.''

Marie Leone, CFO.com
July 30, 2004

Nearly three years after Enron filed for bankruptcy, corporate accounting scandals continue to make headlines.

In the past few months, for example, the Securities and Exchange Commission charged Siebel Systems with violating Regulation Fair Disclosure (Reg FD) for the second time in four years; the SEC charged Lucent Technologies with "fraudulently and improperly" recognizing $1.15 billion of revenues in 2000; and a Pentagon official told Congress that "significant deficiencies" have been found in Halliburton's handling of billions of dollars of government work in Iraq.

What happens next to executives at those companies is anyone's guess. But professors at The Darden School of the University of Virginia have found a way to put such cases to good use in a course aimed at helping executives cope with the broader regulatory fallout. "Our program will be driven by situations pulled from the headlines, so we can focus on corrective and preventive measures," asserts Mark Haskins, a professor of business administration at Darden.

The course's intent, however, "is not to dwell on the headlines," says Haskins, "but to use them to galvanize the conversation and understand the root causes."

"Financial Stewardship in a World of Financial Scrutiny" is designed to bring managers up to speed on various "accounting shenanigans" by supplying them with a "heavy dose of financial expertise," according to the professor. To that end, the three-day session covers six finance topics: the external reporting environment; financial-statement analysis; shareholders' information needs; the Securities and Exchange Commission's Reg FD; company-valuation criteria; and creating shareholder value.

That's a lot to cram into a short course, Haskins acknowledges. He explains, however, that the program isn't meant to be an exhaustive exploration of the topics but rather a discussion of "key insights derived from big issues."

To be sure, Haskins and his co-instructor, Kenneth Eades, also a Darden business administration professor, plan to plunge into some heavy legal territory, notably the Securities Acts of 1933 and 1934, Reg FD, and the Sarbanes-Oxley Act of 2002. They intend to pay special attention to the financial-statement-certifications that Sarbanes-Oxley mandates for CEOs and CFOs and on the cascading impact of those signoffs on operating managers. What's more, the professors aim to discuss financial-reporting transparency, including revenue-recognition policies, management's disclosure and analysis, the debate on expensing stock options, and pension-fund liabilities.

But the intent of the course isn't to provide a mastery of the rules. Instead, Haskins wants attendees to leave the classroom with a better sense of how to spot accounting games, such as those involving irregular revenue-recognition. The professor also hopes to help attendees develop skills to handle the internal pressure to "make the numbers at all costs."

Like other reform proponents, Haskins believes that the new corporate reality demands greater financial transparency. He points out, however, that many executives forget that transparency is not relegated to green-eyeshade types in the finance department. The responsibility for accurate financial reporting ripples through the entire organization — is why the course targets more than financial executives.

Indeed, most of the course's participants likely will be referred to it by CFOs with holistic views of financial reporting, according to the professor. The range of attendees, Haskins thinks, will include finance chiefs, sales and marketing executives, and general managers of divisions or business units. On the other hand, the program isn't likely to resonate with not-for-profit executives or owners of small family businesses because of its focus on public-company topics.

New this year to Darden's executive-education curriculum, the course will be held from November 16 to November 19. The course will be based on case studies to show how executives can make practical use of the tactics and strategies, according to Haskins, but theories of financial-statement preparation and corporate valuation won't be ignored.

Participants, who will be taught how to derive valuations for their own companies, are encouraged to bring their employers' financial statements to class. The valuation instruction will include the use of net-present-value, internal-rate-of-return, and cash-flow analyses. In the end, however, Haskins hopes that students should come away with a firm understanding that "the better the financial reporting, the better the valuation."

Study Note - 6

INVESTMENT DECISIONS

6.1 Cost Benefits Risk Analysis For Projects

This Section includes :

- **Techniques of Risk Analysis**
- **Conventional Techniques**
- **Statistical Techniques**

INTRODUCTION :

In the capital budgeting decisions, if there is an element of risk involved, it must be considered while evaluating investment proposals. There are several techniques available to analyse the risk perception of capital budgeting proposals. These techniques differ in their approach and methodology to analyse risk in the evaluation process.

TECHNIQUES OF RISK ANALYSIS :

Conventional Techniques

1. Risk Adjusted Discount Rate
2. Certainty Equivalents Approach
3. Sensitivity Analysis

Statistical Techniques

1. Probability Distribution Approach
2. Simulation Analysis
3. Decision Tree Approach

CONVENTIONAL TECHNIQUES :

There are several conventional techniques which attempt to incorporate the risk in capital budgeting proposals. Some of these techniques have been discussed hereunder.

1. Risk Adjusted Discount Rate (RADR)

Every firm is basically risk averse and tries to avoid risk. However, it may be ready to take risk provided it is rewarded for undertaking risk by higher returns. So, more risky the investment is, the greater would be the expected return. The expected return is expressed in terms of discount rate which is also termed as the minimum required rate of return generated by a proposal if it is to be accepted. Therefore, there is a positive correlation between risk of a proposal and the discount rate.

A firm at any point of time has a risk level emanating from the existing investment. The firm also has a discount rate to reflect that level of risk. In case, there is no risk of the existing investment, then the discount rate may be known as the risk free discount rate. If the risk level of the new proposal is higher than the risk level of the existing investment, then the discount rate to be applied to find out the present values of the cash flows of the proposals having varying degrees of risk should be evaluated at different discount rates. The difference between the discount rate applied to a riskless proposal and to a risky proposal is known as risk premium.

RADR attempts to incorporate risk by modifying the discount rate. A risk premium is added to the riskless discount rate, to reflect the risk inherent in the project. The reasoning behind adding the risk premium is quite simple. i.e., the greater the risk, the higher should be the desired return from a proposal. The RADR approach to handle risk in a capital budgeting decision process is a more direct method. The RADR is based on the premise that riskiness of a proposal may be taken care of, by adjusting the discount rate. The cash flows from a more risky proposal should be discounted at a relatively higher discount rate as compared to other proposals whose cash flows are less risky. The RADR may be expressed in terms of Equation

RADR = Risk Free Return + Premium for facing the Risk

The risk free discount rate is described as the rate of return on the government securities. Since all the business proposals have higher degree of risk as computed to zero degree of risk of government securities, the RADR is always greater than the risk free rate. Moreover, as the risk of a proposal increases, the risk adjustment premium also increases. The relationship between the risk free rate, the risk premium, the RADR and the risk return line has been explained in the figure below :
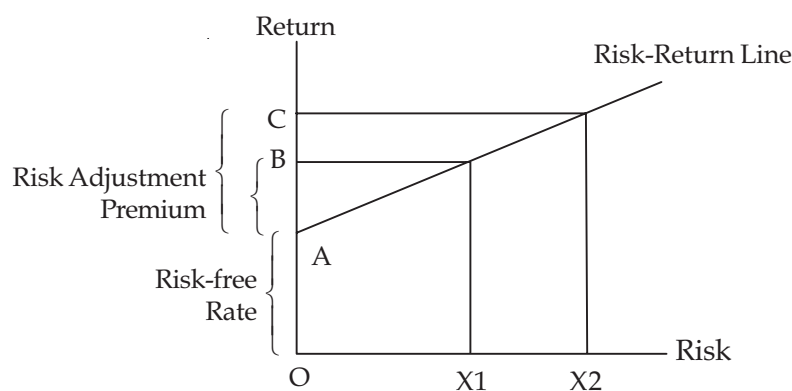
Risk-free rate, Risk Premium and Risk-return relationship

The figures reflects that if the risk of proposal is zero, then the minimum required rate of return, i.e., the discount rate will be just equal to the risk free rate, i.e., OA. However, as the risk increases, say, up to X1, then the required rate of return also increases from OA to OB. The component AB is known as the risk adjustment premium. Similarly, if the level of risk of a proposal is X2, then the risk premium may be AC and the discount rate for such proposal

will be equal to OC. The risk premium being added to the risk free rate reflects the greater risk attached to a proposal. As the risk increases, the risk premium also increases and the RADR also increases. The RADR is used to find out the risk adjusted NPV of the proposal as per Equation

$$\text{RANPV} = \sum_{i=1}^{n} \frac{CFi}{[1+Ra]} - C0$$

RANPV = Risk adjusted NPV

CF_1 = Cash inflows occurring at different points of time

C_0 = Initial cash outflow

R_a = Risk adjusted discount rate.

Difference between the NPV method, discussed in the previous chapter, and the RADR is that the rate of discount used in RADR, i.e., Ra is higher than the original discount rate, i.e., R. The RADR reflects the return that must be earned by a proposal to compensate the firm for undertaking the risk. The higher the risk of a proposal, the higher the RADR would be and therefore the lower the NPV of a given set of cash flows. The decision rule of RADR is that a firm should select the proposal if the RANPV is positive or even zero and reject the proposal if it is negative. In case of mutually exclusive proposals, the rule may be : select the alternative which has the highest positive RANPV. In case, the firm is applying the IRR technique for evaluation of capital budgeting proposals, then IRR of the project can be compared with the RADR, i.e., the minimum required rate of return to accept or reject the proposal.

Evaluation of RADR Approach— The RADR approach considers the time value of money and explicitly incorporates the risk involved in the project by making the discount rate as a function of the proposal's risk. The RADR helps finding out the expected future wealth generated by a risk project over and above the RADR, However, the RADR suffers from the basic shortcoming relating to the determination of the risk adjustment premium or the RADR itself. Moreover, the RADR does not adjust the future cash flows which are risky and uncertain.

2. Certainty Equivalents (CE)

The CE approach to incorporate the risk is to adjust the cash flows of a proposal to reflect the riskiness. The CE approach attempts at adjusting the future cash flows instead of adjusting the discount rates. The expected future cash flows which are taken as risky and uncertain are converted into certainty cash flows. Initiatively, more risky cash flows will be adjusted down lower than the less risky cash flows. The extent of adjustment will vary and it can be either subjective or based on a risk return model. These adjusted cash flows are then discounted at risk free discount rate to find out the NPV of the proposal. The procedure for the CE approach can be explained as follows:

1. Estimate the future cash flows from the proposal. These cash flows do have some degree of risk involved.

2. Calculate the CE factors for different years. These CE factors reflect the proportion of the future cash flow a finance manager would be ready to accept now in exchange for the future cash flow. For example, cash inflow of Rs. 10,000 is receivable after 2 years. However, if the inflow is available right now, the firm may be ready to accept even 70% of Rs. 10,000, i.e., Rs.7,000 only. This 70% or 0.7 is the CE factor. The CE factor will be different from year to year. The higher the riskiness of cash flow, the lower would be the CE factor.

3. The expected cash flows for different years as calculated in step 1 above are multiplied by the respective CE factors and the resultant figures are described as certainty equivalent cash flows.

4. Once all the cash flows are reduced to CE cash flows, then these CE cash flows are discounted at risk free rate to find out the NPV of the proposal.

The CE approach may be described in terms of Equation

$$RANPV = \sum_{i=1}^{n} \frac{ai\, CFi}{[1+kf]} - C0$$

Where RANPV = Risk adjusted NPV of the proposal

a_i = CE factors for different years

CF_i = Expected cash flows for different years

K_f = Risk free discount rate

Co = Initial Cash Outflow

In the above equation, the value of a_1 i.e., the CE factors will vary between 0 and 1, and will vary inversely to risk. The greater the risk involve (may be due to time factor or otherwise), the lower will be the value of a.

The decision rule associated with the CE approach is that accept a proposal with positive CE NPV. In case of mutually exclusive proposals, the rule is that the proposal having the highest positive CE NPV is accepted. If a firm is using IRR technique to evaluate the capital budgeting proposals, then the IRR of the CE cash flows can be calculated and computed with the minimum required rate of return to make an appropriate decision.

Evaluation of CE Approach— The CE approach explicitly recognises the risk and incorporates it by deflating the cash flows to CE cash flows. This approach seems to be conceptually superior to the RADR and does not assume that risk increases over time at a constant rate. But the CE approach involves the determination of CE factors which is a tedious job.

Comparison of RADR and CE Approach— Both the RADR and the CE approach attempt to incorporate the project risk, of course, in a different way. The RADR incorporates the risk by increasing the discount rate, i.e., deals with the denominator of the NPV formula. The CE approach incorporates the risk by deflating the expected cash flows to CE cash flows and it deals with the numerator of the NPV formula. In case of RADR, there is an implied assumption

that the risk of the proposal increases at a constant rate over the life of the project. On the other hand, the CE approach incorporates the different degrees of risk involved for different years.

The RADR tends to club together the risk free rate, the risk involved and the risk premium, while the CE approach maintains a distinction between the risk free rate and the risk. The discount rate in CE approach is taken as the risk free discount rate and is constant while the risk is incorporated by adjusting the cash flows.

Both the RADR and the CE approach attempt to incorporate the risk, yet they differ in their approach. The relative position of these two techniques have been presented in the following figure which shows that RADR converts the risky cash flows into present values in one stroke, while the CE approach makes separate adjustments for time and the risk.
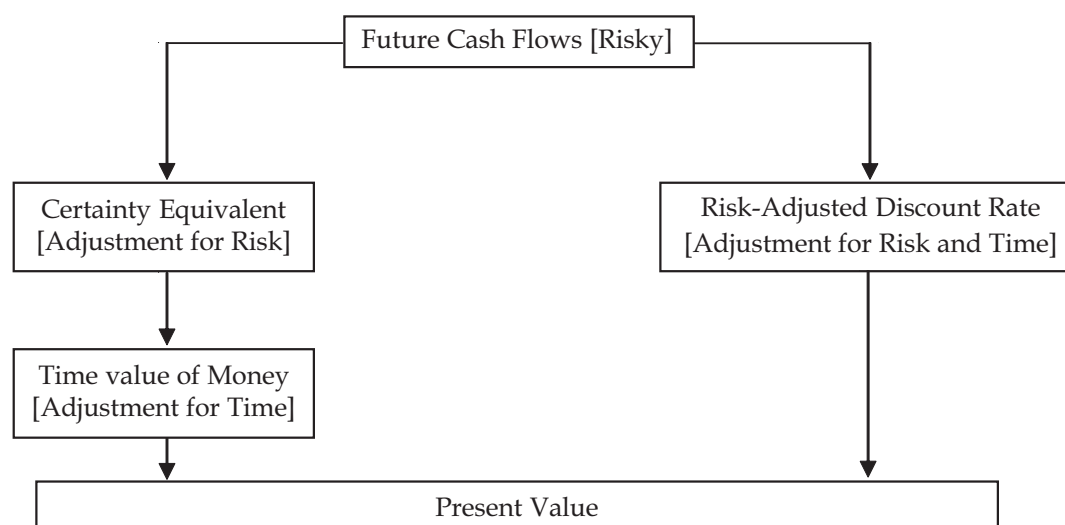
3. Sensititivity Analysis (SA)

The NPV of a project is based upon the series of cash flows and the discount factor. Both these determinants depend upon so many variables such as sales revenue, input cost, competition, etc. Given the level of all these variables, there will be a series of cash flows and there will be NPV of the proposal. If any of these variables changes, the value of the NPV will also change. It means that the value of NPV is sensitive to all these variables. However, the value of NPV will not change in the same proportion for a given change in any one of these variables. For some variables, the NPV may be less sensitive while for others, the NPV may be more sensitive. The Sensitivity Analysis (SA) deals with the consideration of sensitivity of the NPV in relation to different variables contributing to the NPV. The following steps are required to find out the sensitivity of NPV to different variables:

(a) Based on the expectations about the future, the cash flows are estimated in respect of the proposal. NPV of the proposal is calculated on the basis of these cash flows.

(b) Variables which have a bearing on the cash flows of a proposal are identified. For example, some of these variables may be selling price, cost of inputs, market share, market growth rate, etc.,

(c) To find out the effect of change in any of these variables on the value of NPV. This exercise should be performed for all the factors individually. For example, in case of a project involving the product sale, the effect of change in different variables such as number of units sold, selling price, discount rate, etc., can be taken up on the NPV or IRR of the Project. This information can be used in conjunction with the basic capital budgeting analysis to decide whether or not to take up the project.

The sensitivity of a capital budgeting proposal, in general, may be analysed with reference to

a. level of revenues,

b. the expected growth rate in revenues,

c. the operating margin, and

d. the working capital requirements as a percentage of revenue, etc., With each such variable, the NPV and IRR of a proposal may be ascertained by keeping the other variables unchanged.

Evaluation of Sensitivity Analysis—SA helps in identifying the different variables having effect on the NPV of a proposal. It helps in establishing the sensitivity or vulnerability of the proposal to a given variable and showing areas where additional analysis may be undertaken before a proposal is finally selected. The final decision on whether or not to take up the proposal will be based on the regular capital budgeting analysis and the information generated by the sensitivity analysis. It is entirely possible that a decision maker, when faced with the results from the SA. might decide to override a proposal originally approved by capital budgeting analysis. He may point out that a small change in any one variable makes the proposal unacceptable. However, SA has some limitations as follows.

1. It may be observed that the SA is neither a risk measuring nor a risk-reducing technique. It does not provide any clear cut decision rule.

2. Moreover, the study of effect of variations in one variable by keeping other variables constant may not be very effective as the variable may be interdependent. The variables are often related and move together, e.g., the selling price and the expected sales volume are interrelated.

3. The analysis presents the results for range of values, without providing any sense of the likelihood of these values occurring.

STATISTICAL TEHNIQUES :

The different techniques discussed above fail to measure and quantify the risk in precise terms. There are certain statistical techniques available to measure and incorporate risk in a capital budgeting decision process. These techniques can be used to evaluate the risk-return

characteristics of a capital budgeting proposal. The most important concept used in these statistical techniques is that of probability. Therefore, before analysing the statistical techniques of incorporating risk, the concept of probability must also be understood.

The Concept of Probability — The probability may be defined as the likelihood of happening or non-happening of an event. It may be described as measure of chance of happening or non-happening of an event.

1. Probability Distribution

The probability distribution may be defined as a set of possible cash flows that may occur at a point of time and their probabilities of occurrence. In probability distribution, given above for year 1, there are 4 possible cash inflows. The probabilities given for these cash inflows can be interpreted as follows :

There is a 20% chance that the cash inflows will be Rs1,00,000; there is 40% chance that the cash inflows will be Rs1,50,000 and so on. The probabilities can be assigned on the basis of past experience or historical data. If the decision maker foresees a risk in the proposal then he has to prepare a separate probability distribution to summarize the possible cash flow for each year through the economic life of the proposal. The next step is to find out the expected value of probability distribution for each year.

Expected Value of a Probability Distribution

The initial step required in evaluating a risky proposal is to find out the expected value of probability distribution for each year. For this, each cash flow of the probability distribution is multiplied by the respective probability of the cash flow and then adding the resulting products. This final figure is then considered as the expected value of the cash flow for that year for which the probability distribution has been considered. This procedure is to be adopted for the probability distributions for all the years and then the expected value of cash inflows are discounted at an appropriate discount rate to find out the NPV of the proposal. This has been presented in following equation.

$$RANPV =$$

Where NPV = Net present value of the proposal,

$EVCF_i$ = Expected value of cash inflows for different years, and

k = Discount Rate.

Co = Intital Cash Outflow

2. Simulation

The dictionary meaning (WEBSTER) of SIMULATION is "*to assume the mere appearance of without the reality*". Thus the appearance is true but not real, which implies that *simulation* is imitation of reality. *Simulation* is the representation of a system by a model which will react to change in a similar way to that which is being simulated. This evolves a decision maker to predict the outcome of particular decision through testing it via the model. Normally *simulation techniques* are used to solve problems involving uncertainty. There are several techniques of *simulation* that are in use. However, '*Monte-carlo*'method is very popular as it is very simple and easy to use. The technique uses random numbers and is used to solve problems which involves conditions of uncertainty.

In simulation, a computer would normally be listed to build and run the model. This particularly important in this area, since meaningful information can be extracted from the *simulation* only after a number of runs with different random numbers. If we are interested in the steady state of die model, the simulation must be allowed to proceed for a long period of simulated time so that average volumes of the relevant statistics may be calculated. If the period is too short, the initial start up fluctuations can affect the mean values.

3. Decision Tree Approach

The evaluation of a project frequently requires a sequential decision-making process where the accept-reject decision is make in several stages. Instead of taking a decision once for all, it is broken up into several parts and stages. At each stage there may be more than one option available and the firm may have to decide every time that which option is to be taken for. This can be explained with the help of simple situation.

A firm is considering to launch a new product and to install a plant with capacity of 10,000 units a month. It is hopeful of selling the entire production. However, if due to one or the other factor, the demand is not generated to lift even the break-even level of production, then the firm will face a heavy loss. In this case, it will be better for the firm to first install a pilot project and go for test marketing. If the product is accepted by the market, full-fledged plant may be installed in the next stage. This is a two-stage decision. The first occurs before the test market. At that point, cash flows related to both the test and to the production must be considered. After the test, another decision must be made. At this point, the cash flows related to the market test are sunk costs and are irrelevant to the decision to be made. At this second point, the decision to be made cannot affect the cash flows already made in connection with the market test.

An analytical technique used in sequential decisions is decision tree. The decision tree approach gets its name because of the resemblance with a tree having number of branches. A decision tree is a branching diagram representing a decision problem as a series of decisions to be taken under conditions of uncertainty. A decision presently being considered depends upon the past decision and their outcomes. The decision trees are the diagrams that permit the various decisions alternatives, their outcomes and probabilities of their occurrences to be

mapped in a clear fashion. In a typical decision tree, the project is broken down into clearly defined stages and the possible outcomes at each stage are listed along with the probabilities and cash flows effect of each outcome.

Steps in Decision Tree Approach

While constructing a decision tree for a given problem, the following steps may be required:

1. Break the Project into clearly defined stages. For example, a computer software company may take up the project of new package in different stages, i.e., research and development, market testing, limited production and then full production.

2. List all the possible outcomes at each stage. Specify the probability of each outcome at each stage based on information available. This task will become progressively more difficult as more and more stages are introduced.

3. Specify the effect of each outcome on the expected cash flows form the project.

4. Evaluate the optimal action to be taken at each stage in the decision tree, based on the outcome at the previous stage and its effect on cash flow.

6.2 Designing Capital Structure

This Section includes :

- **Capital Structure and Financial Structure**
- **Features of an Appropriate Capital Structure**
- **Determinants of capital structure**

INTRODUCTION :

A firm needs funds for long term requirements and working capital. These funds are raised through different sources both short term and long term. The long term funds required by a firm are mobilized through owners funds (equity share, preference shares and retained earnings) and long term debt(debentures and bonds). A mix of various long term sources of funds employed by a firm is called capital structure.

According to Gerestenberg, "Capital structure of a company refers to the composition or make-up of its capitalization and it includes all long term capital resources, viz, loans, bonds, shares and reserves". Thus capital structure is made up of debt and equity securities and refers to permanent financing of a firm.

Financial manager has to plan the appropriate mix of different securities in total capitalization in such a way as to minimize the cost of capital and maximize the earnings per share to the equity shareholders. There may be four fundamental patterns of capital structure as follows:

      i.   Equity capital only(including Reserves and Surplus)

     ii.   Equity and preference capital

   iii.   Equity, preference and long term debt i.e. debentures, bonds and loans from financial institutions etc.

   iv.   Equity and long term debt.

CAPITAL STRUCTURE AND FINANCIAL STRUCTURE :

Some authors use capital structure and financial structure interchangeably. But, both are different concepts. Financial structure refers to the way in which the total assets of a firm are financed. In other words, financial structure refers to the entire liabilities side of the balance sheet. But, capital structure represents only long term sources of funds and excludes all short term debt and current liabilities. Thus, financial structure is a broader one and capital structure is only part of it.

FEATURES OF AN APPROPRIATE CAPITAL STRUCTURE :

A capital structure will be considered to be appropriate if it possesses following features:

1. Profitability — The capital structure of the company should be most profitable. The most profitable capital structure is one that tends to minimize cost of financing and maximize earnings per equity share.

2. **Solvency —** The pattern of capital structure should be so devised as to ensure that the firm does not run the risk of becoming insolvent. Excess use of debt threatens the solvency of the company. The debt content should not, therefore, be such that it increases risk beyond manageable limits.

3. **Flexibility —** The capital structure should be such that it can be easily maneuvered to meet the requirements of changing conditions. Moreover, it should also be possible for the company to provide funds whenever needed to finance its profitable activities.

4. **Conservatism —** The capital structure should be conservative in the sense that the debt content in the total capital structure does not exceed the limit which the company can bear. In other words, it should be such as is commensurate with the company's ability to generate future cash flows.

5. **Control —** The capital structure should be so devised that it involves minimum risk of loss control of the company.

The above principles regarding an appropriate capital structure or as a matter of fact militant to each other. For example, raising of funds through debt is cheaper and, is therefore, in accordance with principle of profitability, but it is risky and, therefore, goes against the principle of solvency and conservatism. The prudent financial manager should try to have the best out of the circumstances within which the company is operating. The relative importance of each of the above feature will also vary from company to company. For example, one company may give more importance to flexibility as compared to conservatism while the other may consider solvency to be more important than profitability. However, the fact remains that each finance manager has to make a satisfactory compromise between the management's desire for funds and the trend in the supply of funds.

DETERMINANTS OF CAPITAL STRUCTURE :

The following are the factors influencing the capital structure

The capital structure of a firm depends on a number of factors and these factors are of different importance. Moreover, the influence of individual factors of a firm changes over a period of time. Generally, the following factors should be considered while determining the capital structure of a company.

i. Trading on equity and EBIT-EPS analysis

The use of long term debt and preference share capital, which are fixed income bearing securities, along with equity share capital is called financial leverage or trading on equity. The use of long term debt capital increases the earnings per share as long as the return on investment is greater than the cost of debt. Preference share capital will also result in increasing EPS. But the leverage effect is more pronounced in case of debt because of two reasons:

  a. Cost of debt is usually lower than the cost of preference share capital,

  b. The interest paid on debt is tax deductible.

Because of its effects on the earnings per share, financial leverage is one of the important considerations in planning the capital structure of a company, the companies with high level of Earnings Before Interest and Taxes (EBIT) can make profitable use of the high degree of

leverage to increase the return on the shareholders equity. The EBIT-EPS analysis is one important tool in the hands of the financial manager to get an insight into the firms capital structure planning. He can analyse the possible fluctuations in EBIT and their impact on EPS under different financing plans.

Under favorable conditions, financial leverage increases EPS, however it can also increase financial risk to shareholders. Therefore, the firm should employ debt to such an extent that financial risk does not spoil the leverage effect.

ii. Growth and stability of sales

This is another important factor which influences the capital structure of a firm. Stability of sales ensures stable earnings, so that the firm will not face any difficulty in meeting its fixed commitments of interest payment and repayment of debt. So the firm can raise a higher level of debt. In the same way, the rate of growth in sales also affects the capital structure decision. Usually, greater the rate of growth of sales, greater can be the use of the debt in the financing of a firm. On the other hand, the firm should be very careful in employing debt capital if its sales are highly fluctuating and declining.

iii. Cost of capital

Cost of capital is another important factor that should be kept in mind while designing the capital structure of a firm. The capital structure should be designed in such a way that the firm's overall cost of capital is the minimum. Cost of capital is the minimum return expected by its suppliers. Of all the sources of capital, equity capital is the costliest as the equity shareholders bear the highest risk. On the other hand, debt capital is the cheapest source because the interest is paid on it by the firm whether it makes profits or not. Moreover, interest on debt capital is tax deductible which makes it further cheaper. Preference share capital is also cheaper than equity capital as the dividends are paid at a fixed rate on preference shares. So, the overall cost of capital depends on the proportion in which the capital is mobilized from different sources of finance. Hence, capital structure should be designed carefully so that over all cost of capital is minimized.

iv. Cash flow ability

A firm which has the ability of generating larger and stable cash inflows will be able to employ more debt capital. The firm has to meet fixed charges in the form of interest on debt capital, fixed preference dividend and the principal amount, when it becomes due. The firm can meet these fixed obligations only when it has adequate cash inflows. Whenever a firm wants to raise additional funds, it should estimate the future cash inflows to ensure the coverage of fixed charges. Fixed charges coverage ratio and interest coverage ratio are relevant for this purpose.

Here, one important point to be considered is that it is the cash flow ability of the firm and not the earning capacity alone (as indicated by EBIT) that should be taken into view while designing the capital structure. A firm may have adequate profits (EBIT) but it may not have adequate cash inflows to meet its fixed charges obligation. Some times, inadequacy of cash inflows may lead the firm to the point of insolvency, when it fails to meet its payment obligations in time. Therefore debt capacity of the firm is determined by its cash flow ability.

v. Control

Some times, the designing of capital structure of a firm is influenced by the desire of the existing management to retain the control over the firm. Whenever additional funds are required, the management of the firm wants to raise the funds without any loss of control over the firm. If equity shares are issued for raising funds, the control of the existing shareholders is diluted. Because of this, they may raise the funds by issuing fixed charge bearing debt and preference share capital, as preference shareholders and debt holders do not have any voting right. The Debt financing is advisable from the point of view of control. But overdependence on debt capital may result in heavy burden of interest and fixed charges and may lead to liquidation of the company.

vi. Flexibility

Flexibility means the firm's ability to adapt its capital structure to the needs of the changing conditions. Capital structure should flexible enough to raise additional funds whenever required, without much delay and cost. The capital structure of the firm must be designed in such a way that it is possible to substitute one form of financing for another to economise the use of funds. Preference shares and debentures offer the highest flexibility in the capital structure, as they can be redeemed at the discretion of the firm.

vii. Size of the firm

The size of the firm influences the capital structure design of a firm. Small companies find it very difficult to mobilise long-term debt, as they have to face higher rate of interest and inconvenient terms. Hence, small firms make their capital structure very inflexible and depend on share capital and retained earnings for their long-term funds. Since their capital structure is small, small firms cannot go to the capital market frequently for the issue of equity shares, as it carries a greater danger of loss of control over the firm to others. Hence, the small firms sometimes limit the growth of their business and any additional fund requirements met through retained earnings only. However, a large firm has relative flexibility in capital structure designing. It has the facility of obtaining long-term debt at relatively lower rate of interest and convenient terms.   More, the large firms have relatively an easy access to the capital market.

viii. Marketability and timing

Capital market conditions may change from time to time. Sometimes there maybe depression and at over times there may be boom condition in the market. The firm should decide whether to go for equity issue or debt capital by taking market sentiments into consideration. In the case of depressed conditions in the share market, the firm should not issue equity shares but go for debt capital. On the other hand, under boom conditions, it becomes easy for the firm to mobilise funds by issuing equity shares.

The internal conditions of a firm may also determine the marketability of securities. For example, a highly levered firm may find it difficult to raise additional debt. In the same way, a firm may find it very difficult to mobilise funds by issuing any kind of security in the market merely because of its small size.

ix. Floatation costs

Floatation costs are not a very significant factor in the determination of capital structure. These costs are incurred when the funds are raised externally. They include cost of the issue of prospectus, brokerage, commissions, etc. Generally, the cost of floatation for debt is less than for equity. So, there may be a temptation for debt capital. There will be no floatation cost for retained earnings. As is said earlier, floatation costs are not a significant factor except for small companies.

Floatation costs can be an important consideration in deciding the size of the issue of securities, because these costs as a percentage of funds raised will decline with the size of the issue. Hence, greater the size of the issue, more will be the savings in terms of floatation costs. However, a large issue affects the firm's financial flexibility.

x. Purpose of financing

The purpose for which funds are raised should also be considered while determining the sources of capital structure. If funds are raised for productive purpose, debt capital is appropriate as the interest can be paid out of profits generated from the investment. But, if it is for unproductive purpose, equity should be preferred.

xi. Legal requirements

The various guidelines issued by the Government from time to time regarding the issue of shares and debentures should be kept in mind while determining the capital structure of a firm. These legal restrictions are very significant as they give a framework within which capital structure decisions should be made.

6.3 Capital Investment Real Options

This Section includes :

- **Real Option-Key Concept**
- **Terms and Definitions**
- **Factors Affecting Value of an Option**
- **Real Options in Capital Investment Decisious**
- **Comparison of Options Pricing Models**

INTRODUCTION :

A real option is the right, but not the obligation, to undertake some business decision, typically the option to make a capital investment. For example, the opportunity to invest in the expansion of a firm's factory is a real option. In contrast to financial options, a real option is not often tradable - e.g. the factory owner cannot sell the right to extend his factory to another party, only he can make this decision. However, some real options can be sold, e.g., ownership of a vacant plot of land is a real option to develop that land in the future. Some real options are proprietary (owned or exercisable by a single individual or a company); others are shared (can be exercised by many parties). Therefore, a project may have a portfolio of embedded real options; some of them can be mutually exclusive.

REAL OPTION-KEY CONCEPT :

The terminology "real option" is relatively new, whereas business operators have been making capital investment decisions for centuries. However, the description of such opportunities as real options has occurred at the same time as thinking about such decisions in new, more analytically-based, ways. As such, the terminology "real option" is closely tied to these new methods. The term "real option" was coined by Professor Stewart Myers at the MIT Sloan School of Management.

The concept of real options was popularized by Michael J. Mauboussin, the chief U.S. investment strategist for Credit Suisse First Boston and an adjunct professor of Finance at the Columbia School of Business. Mauboussin uses real options to explain the gap between the stock market prices and the "intrinsic value" for those businesses as calculated by traditional financial analysis.

Additionally, with real option analysis, uncertainty inherent in investment projects is usually accounted for by risk-adjusting probabilities (a technique known as the Equivalent Martingale approach). Cash flows can then be discounted at the risk-free rate. With regular DCF analysis, on the other hand, this uncertainty is accounted for by adjusting the discount rate, using e.g. the cost of capital or the cash flows (using certainty equivalents). These methods normally do not properly account for changes in risk over a project's lifecycle and failure to appropriately adapt the risk adjustment. More importantly, the real options approach forces decision makers to be more explicit about the assumptions underlying their projections.

In business strategy, real options have been advanced by the construction of option space, where volatility is compared with value-to-cost. Latest advances in real option valuation are

models that incorporate fuzzy logic and option valuation in fuzzy real option valuation models.

TERMS AND DEFINITIONS

Strategic NPV = Passive NPV + Present value of options arising from the active management of the firm's investment opportunities

The terms used in the study of real options are given below

- An option is a right to buy or sell a particular good for a limited time at a specified price *(the exercise price)*. A *call* option is the right to buy. A *put* option is the right to sell.

- The *expiration* date is the date when the option matures. An *American option* is exercisable anytime until the end of the expiration date while a *European option* is exercised only at the expiration date.

- The *writer* of an option contract sells the call or put option while the buyer purchases the option contract from the seller. For real options, the firm is the implied buyer and the market is the implied seller. No actual contract is traded.

- A call option is *out-of-the-money* when the price of the underlying assets is below the exercise price of the call and *in-the-money* when the price of the underlying assets is above the striking price of the call. The opposite is true for a put option, which is *outof-the-money* when the price of the underlying assets is above the striking price of the call and *in-the-money* when the price of the underlying assets is below the striking price of the call.

- Buyers may hold a *long (buy)* or *short (write)* position in the option.

FACTORS WHICH AFFECT THE VALUE OF AN OPTION :

The factors which affect the value of an option are given below

Symbol	Factor as it relates to stock option value	Factor as it relates to capital budgeting
P_O	Price of the underlying asset (i.e., stock price)	PV of expected operation CFs discounted at the project's cost of capital
X	Exercise price	For call options-the initial investment. For put options-the value of the project's assets if sold or shifted to a more valuable use
T	Time until the option expires	Time until the option expires or is no longer Available
K_{rf}	Risk-free rate of interest	Risk-free rate of interest (use the yield on U.S.T-bills
E	Standard deviation of the underlying asset (volatility of stock price)	Project risk - standard deviation of the operating cash flow as a percent of total investment

REAL OPTIONS IN CAPITAL INVESTMENT DECISIONS :

Option	Valued as a
wait & learn more before investing	call
default during construction (staged investment)	a series of put options
alter operating scale (expand, restart)	call
alter operating scale (contract, shut down)	put
Abandon	put
switch inputs or outputs	call + put
grow and build-on previous investments	call

A COMPARISON OF OPTIONS PRICING MODELS :

	Binominal Model	Black-Scholes Model
description	*assumes that the time to an option's maturity can be divided into a number of subintervals, in each of which, there are only two possible price changes	the binomial modelestimated over anfinite number of sub-intervals
Advantages	*easier for executives to understand *bigger range of applications (B-S model cannot be used in all cases) *similar in structure to a decision tree but a much more concise representation of complex relationships	easy to calculate with tables
disadvantages	*more than one or two sub-intervals requires computer simulation *not easy to explain to executives	not easy to explain to executives

6.4 Venture Capital

This Section includes :

- **Features of Venture Capital**
- **Modes of Finance by Venture Capitalists**

INTRODUCTION :

Venture capital is a form of equity financing especially designed for funding high risk and high reward projects.

There is a common perception that venture capital is a means of financing high technology projects. However, venture capital is investment of long term finance made in :

1. Ventures promoted by technically or professionally qualified but unproven entrepreneurs, or

2. Venture seeking to harness commercially unproven technology. Or

3. High risk ventures.

The term 'venture capital' represents financial investment in a highly risky project with the objective of earning a high rate of return.

FEATURES OF VENTURE CAPITAL :

The main features of venture can be summarised as follows:

1. **High Degree of risk**

   Venture capital financing is, invariably, an investment in a highly risky project with the objective of earning a high rate of return.

2. **Equity Participation**

   Venture capital financing is, invariably, an actual or potential equity participation wherein the object of venture capital is to make capital gain by selling the share once the project become profitable.

3. **Long term Investment**

   Venture capital financing is a long term investment. It generally taken a long period to encash the investment in securities made by the venture capitalists.

4. **Participation in Management**

   In addition to provide capital, venture capital funds take an active interest in the management of the form that of a traditional lender or banker. It is also different from that of accompany stock market investor who merely trades in the shares of a company without participating in their management. It has been rightly said, "Venture capital combines the qualities of banker, stock market investor and entrepreneur in one".

5. **Achieve Social Objectives**

It is different from the development capital provided by several central and state level government bodies in that the profit objective is the motive behind the financing. But venture capital profits generate employment, and balanced regional growth indirectly due to setting up successful new business.

6. **Investment is Illiquid**

A venture capital is not subject to repayment on demand as with an overdraft or following a loan repayment schedule. The investment is realized only when the company is sold or achieves a stock market listing. It is lost when the company goes into liquidation.

MODES OF FINANCE BY VENTURE CAPITALISTS :

1. **Equity**

Most of the venture capital funds provide financial support to entrepreneurs in the form of equity by financing 49% of the total equity. This is to ensure that the ownership and overall control remains with the entrepreneur. Since there is a great uncertainty about the generation of cash inflows in the initial years, equity financing is the safest mode of financing. A debt instrument on the other hand requires periodical servicing of dept.

2 **Conditional Loan**

From a venture capitalist point of view, equity is an unsecured instrument hence a less preferable option than a secured debt instrument. A conditional loan usually involves either no interest at all or a coupon payment at nominal rate. In addition, a royalty at agreed rates payable to the lender on the sales turnover. As the units picks up in sales levels, the interest rate are increased and royalty amounts are decreased.

3 **Convertible Loans**

The convertible loan is subordinate to all other loans which may increased to be converted into equity if interest payments are not made within agreed time limit.

Stages of Investment/Financing

A) Early Stage Financing

This stage includes the following :

1. **Seed Capital and R & D Projects**

Venture capitalists are more often interested in providing seed finance i.e making provision of very small amounts for finance needed to turn into a business.

Research and development activities are required to be undertaken before a product is to be launched. External finance is often required by the entrepreneur during the development of the product. The financial risk increase progressively as the research phase moves into the development phase, where a sample of the product is tested before it is finally commercialized. Venture capitalists / firms / funds are always ready to undertake risks and make investment in such R & D projects promising higher returns in future.

2. Start Ups

The most risky aspect of venture capital is the launch of a new business after the Research and Development activities are over. At this stage, the entrepreneur and his product or services are as yet untried. The finance required usually falls short of his own resources. Start ups may include new industries / businesses set up by the experienced persons in the area in which they have knowledge. Others may result from the research bodies or large corporations, where a venture capitalist joins with an industrially experienced or corporate partner. Still other start ups occur when a new company with inadequate financial resources to commercialise new technology is promoted by an existing company.

3. Second Round Financing

It refers to the stage when product has already been launched in the market but has not earned enough profit to attract new investors. Additional funds are needed at this stage to meet the growing needs of business. Venture Capital Institutions (VCIs) provide large funds at this stage than at other early stage financing in the form of debt. The time scale of investment is usually three to seven years.

B) Later stage Financing

Those established business which require additional support but cannot raise capital through public issue, approach venture capital funds for financing expansion, buyouts and turnarounds or for development capital.

1. Development Capital

It refers to the financing of an enterprise which has overcome the highly risky stage and have recorded profits but cannot go public, thus needs financial support. Funds are needed for the purchases of new equipment / plant, expansion of marketing and distributing facilities, launching one to three into new regions and so on. The time scale of investment is usually one to three years and falls in medium risk category.

2. Expansion Financial

Venture capitalists perceive low risk in ventures requiring finance for expansion purpose either by growth implying bigger factory, large warehouse, new factories, new products or new markets or through purchases of exiting business. The time frame of investment is usually from one to three years. It represents the last round of financing before a planned exit.

3. Buyouts

It refers to the transfer of management control by creating a separate business by separating it from their existing owners. It may be of two types.

(i)   Management Buyouts (MBOs)

(ii) Management Buyins (MBIs)

(i) **In Management Buyouts (MBOs) -** Venture capital institutions provide funds to unable the current operating management / investors to acquire an existing product line / business. They represent an important part of the activity of VCIs.

(ii) **Management Buyins -** are funds provide to enable an outside group of manager (s) to buy an existing company. It involves parties: a management team, a target company and an investor (i.e Venture capital institution). MBIs are more risky than MBOs and hence are less popular because it is difficult for new management to assess the actual potential of target company. Usually, MBIs are able to target the weaker or underperforming companies.

4. Replacement capital

VCIs another aspect of financing is to provide funds for the purchases of existing share of owners. This may be due to a variety of reasons including personal need of finance, conflict in the family, or need for association of a well known name. The time scale of investment is one to three years and involve low risk.

5. Turnarounds

Such form of venture capital financing involves medium to high risk and a time scale of three to five years. It involves buying the control of a sick company which required very specialized skills. It may require rescheduling of all the company's borrowings, change in management or even a change in ownership. A very active "hands on" approach is required in the initial crisis period where the venture capitalists may appoint its own chairman or nominate its directors on the board.

In a nutshell, venture capital firms finance both early and later stage investment to maintain a balance between risk and profitability. Venture capitalists evaluate technology and study potential markets besides considering the capability of the promoter to implement the project while undertaking early stage investment. In later stage investment in new markets and track record of the business / entrepreneur is closely examined.

6.5 Hybrid Finance

This Section includes :

- **Preferred Stock**
- **Trust Preferred Securities**
- **Convertible Debentures**
- **Warrants**
- **Innovative Hybrid**

INTRODUCTION :

Equity and debt lie at the two ends of the spectrum of financing. In between lie hybrid sources of financing which partake some characteristics of equity and some characteristics of debt. The important forms of hybrid financing are preference capital, warrants, convertible debentures, and innovative hybrids.

Preference capital ordinarily carries a fixed rate of dividend which is payable at the discretion of directors when the company has distributable surplus.

A warranty gives its holder the right to subscribe to the equity share of a company during a certain period at a specified price.

A convertible debenture is a debenture that is convertible, partially or fully, into equity shares. The conversion may be compulsory or optional.

An innovative hybrid is a hybrid security whose payoff is linked to some general economic variable like the interest rate, exchange rate, or commodity index.

PREFERRED STOCK :

Preferred stock is a hybrid corporate security. It represents an equity interest in the issuing company. Unlike common stock, which pays a variable dividend depending on the corporation's earnings, preferred stock pays a fixed quarterly dividend based on a stated par value. For example, an XYZ corporation might issue preferred stock with a par value of Rs 50.00 and paying a quarterly 2% dividend. This would translate into a Rs 1.00 dividend paid each quarter.

Most corporations do not issue preferred shares. Those that do, often issue multiple classes of preferred shares over time. There are three naming conventions used for distinguishing between the different preferred issues of a corporation.

1) Annualized dividend: the shares in our example would be called XYZ Rs 4.00 preferred.

2) Annualized dividend yield: the shares in our example would be called XYZ 8% preferred.

3) A letter indicating the order of issuance: If the shares in our example were the corporation's third preferred issuance, they would be called XYZ preferred C.

With fixed dividends, preferred shares resemble fixed income instruments. As they don't mature, they most resemble a perpetuity. Preferred shareholders generally don't have voting rights. Also, the board of directors have less of a fiduciary obligation to preferred shareholders than to common shareholders. Some Delaware court decisions have treated the board's obligation to preferred shareholders as purely contractual.

Preferred stock differs from fixed income instruments in their tax treatment. Interest payments are an expense, so they are tax deductible for the corporation. Dividends are distributions of earnings, so they are not tax deductible. Also, depending on the investor's tax jurisdiction, dividends may be taxed differently from interest income.

When it is first issued, preferred stock is priced by the market based on prevailing interest rates. Generally, the issuer will set the preferred's dividend yield so it issues at a price close to par. After issuance, the preferred shares trade in the stock market just like common stock. Credit rating agencies rate preferred stocks based on the issuing corporation's ability to pay dividends. Market prices of highly rated issues tend to fluctuate with interest rates. Prices of lower rated issues - just like prices of lower rated bonds - tend to fluctuate with the issuing corporation's fortunes.

Preferred stock is subordinate to all the issuing corporation's fixed income obligations. If the issuer is not current on the fixed income obligations, it can pay no preferred dividends. If the issuer is liquidated, creditors must be paid in full before preferred stockholders can receive anything. However, preferred shares are superior to common shares. No dividends may be paid to holders of common stock unless dividends to preferred shareholders are also paid in full. In liquidation, preferred shareholders are entitled to at least their par value before common shareholders can receive anything.

Unlike fixed income instruments, failure of a corporation to make preferred dividend payments cannot force the firm into bankruptcy. However, while dividends are not being paid, mandatory restrictions may be placed on management and preferred shareholders may be granted the right to vote for a number of board members. Because it is dependent on dividends not being paid, this is called contingent voting.

Most preferred stock is cumulative. This means that, if a dividend is ever missed, it must eventually be made up to investors. No dividends can be paid to common stockholders until all missed dividends have been paid to preferred stockholders. If preferred shares are issued with no obligation to make up missed dividends, the shares are called non-cumulative.

Callable preferred stock has an embedded option allowing the issuer to call shares, either at par or at a slight premium above par. In a typical arrangement, shares are not callable for the first few years following issuance but can be called, perhaps with a month's notice, any time thereafter. As with callable bonds, the price behavior of callable preferreds depends on whether the call option is in-the-money or out-of-the-money as well as the financial strength of the issuer.

Most preferred stock is issued with a sinking fund provision that requires that the issuer set aside funds to gradually retire the issue over time.

There are a number of other variations on preferred stock:

    a. Adjustable-rate preferred stock (ARPS) has a dividend yield that, instead of being fixed, floats with specified interest rates according to some formula.

    b. Convertible preferred stock has an embedded option that allows the holder to exchange each preferred share for a specified number of common shares. Convertible preferred is usually callable. This allows the issuers to call the stock and force preferred shareholders to choose between accepting either par value or common shares. This is called a forced conversion.

    c. Participating preferred stock pays a regular fixed dividend plus an additional dividend if the common stock dividend exceeds some specified value. Today, this feature is rare.

TRUST PREFERRED SECURITIES :

1. Trust preferred securities (TruPS) are cumulative preferred stock issued by bank holding companies through a special purpose vehicle. The special purpose vehicle is wholly owned by the bank holding company and is usually a trust. It sells the TruPS to investors and uses the proceeds to purchase a subordinated note from the bank holding company. This becomes its sole asset and cash flows from the note largely mirror the dividends payable on the TruPS. The note has an initial maturity of at least 30 years. Dividends are paid quarterly or semi-annually. Dividends may be deferred for at least five years without creating an event of default or acceleration.

2. From a tax standpoint, TruPS have a significant advantage over the direct issuance of preferred shares. This is because dividends on preferred shares are not deductible as a business expense, but interest on a subordinated note is. In this regard, the TruPS behaves like debt. In another regard, it behaves like equity.

3. Initially, TruPS were only issued by larger bank holding companies. This changed in 2000, when several institutions issued TruPS, which were pooled in a CDO. Since then, the TruPS CDO market has grown dramatically and has become a significant source of capital for small and medium sized bank holding companies.

4. TruPS are also issued by insurance holding companies and REITS. Those securities have also been packaged in CDOs.

CONVERTIBLE DEBENTURES :

A convertible debenture is a debenture that can be changed into a specified number of ordinary shares at the option of the owner. A company is, in fact, issuing equity shares in future whenever it offers convertible debentures. The most notable feature of this debenture is that it promises a fixed income associated with debenture as well as chance of capital gains associated with equity share after the owner has exercised his conversion option. Because of this combination of fixed income and capital gains in the convertible debenture, it has been called hybrid security.

Characteristics of Convertible Debentures

When a company issues a convertible debenture, it clearly specifies conversion terms which indicate the number of equity shares in exchange for the convertible debenture, the price at which conversion will take place and the time when the conversion option can be exercised.

Conversion ratio and conversion price The conversion ratio is the number of ordinary shares that an investor can receive when he exchange his convertible debenture. In other words, the number of ordinary shares per one convertible security is called the conversion ratio. The conversion price is the price paid for the ordinary share at the time of conversion. If you know the par value of the convertible security and its conversion price, you can easily find out the conversion ratio:

Conversion ratio = Par value of convertible debenture / Conversion price

Valuation of Convertible Debentures

The valuation of convertible debentures is more complex than the valuation of non-convertible securities since they combine features of both ordinary shares and fixed-income securities. The market value of a convertible debenture will thus depend on: market price of ordinary share, conversion value, and the value of the non-convertible or straight debentures, called investment value.

Conversion value The conversion value of a convertible debenture is equal to the conversion ratio multiplied by the ordinary share's market price. Thus:

Conversion value = Conversion Ratio share price.

Market Value of Convertible Debenture The convertible securities are traded (bought and sold) in the stock market until they are converted into equity shares. The price at which the convertible security sells is called its market value. In India, the secondary market for debentures –including both convertible and non-convertible — is still in a developing stage.

What is the relationship between a convertible debenture's market value, its investment value and its conversion value? A convertible debenture's market value depends on both investment and conversion value. More importantly, its market value cannot be less than its investment value or its conversion value. The difference between the convertible debenture's market value and the higher of the conversion or the NCD value (investment value) is called the *conversion premium.* Thus:

$$\text{Conversion Premium} = \frac{[\text{Market value} - \text{Conversion or Investment value}]}{\text{Conversion or investment value}}$$

Value of a convertible debenture
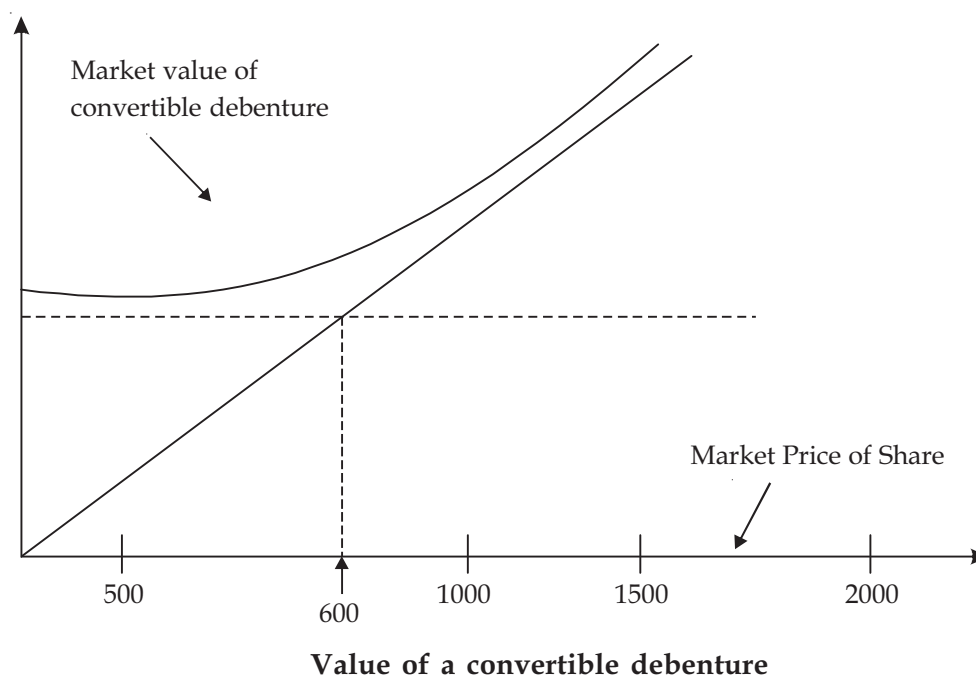
Why issue Convertible Debentures?

At least four reasons can be cited for issuing the convertible debentures. They are:

- Sweetening fixed-income securities
- Deferred equity financing
- Avoiding earnings dilution
- Raising low cost capital

WARRANTS :

A warrant entitles the purchaser to buy a fixed number of ordinary shares at a particular price during a specified time period. Warrants are generally issued along with debentures issue as 'sweetners.' In USA, warrants have been in the past mainly by financially weaker firms to attract investors. Now, of course, warrants are used by large, profitable companies as a part of a major financing package. Warrants may also be used in conjunction with ordinary or preference shares. The purpose is the same, that is, to improve the marketability of the issue.

Detachability

A warrant can be either detachable or non-detachable. If a warrant can be sold separately from the debenture (or preference share) to which it was originally attached, it is called a *detachable warrant*. A debenture holder may sell his warrant when its price increases but continue holding the debenture. The DFPC warrant is a detachable warrant. The company will list it separately, and it will be traded on the stock exchanges. A non-detachable warrant cannot be sold separately from the debenture to which it was originally attached.

Right Warrants entitle to purchase ordinary shares. Therefore, the holders of warrants are not the shareholders of the company until they exercise their options. Therefore, they do not have rights of ordinary shareholders, such as the right to vote or receive dividends. Once they exercise their warrants and buy ordinary shares, they become the company's ordinary shareholders.

Valuation of Warrants

A warrant is an option to buy a stated number of a company's ordinary shares at a given exercise price on or before a specified maturity date. Thus, it is similar to an American call option. As a call option, its market value will be dependent on the market price of the ordinary share and the exercise price. The market price of a company's ordinary share is a function of its expected performance and that of the economy as a whole. Thus, a warrant's market price will in general depend on the issuing company's performance and the general economic conditions.

Theoretical Value

The theoretical value of a warrant can be found out if we know the ordinary share's market price and warrant's exercise price and exercise ratio. There exist two possibilities with regard to the ordinary share's price and the exercise price. Either the ordinary share's price is greater or lesser than the exercise price. If the share price is equal to or greater than the exercise price, then a warrant's theoretical value is given as follows:

Warrant's Theoretical value = (Share price – Exercise price)* Exercise ratio.

Premium

The difference between the warrant's market value and its theoretical value is called the premium. It can be found as follows :

$$\text{Premium} = \frac{\text{Warrant's market value } - \text{ warrant's theoretical value}}{\text{Warrant's theoretical value}}$$

Market Value of a Warrant
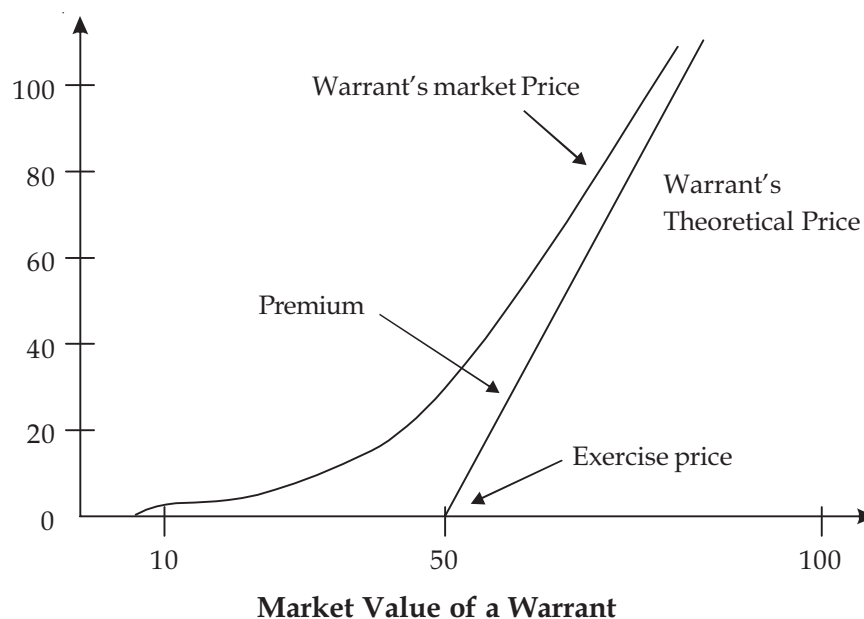
INNOVATIVE HYBRIDS :

A hybrid debt security is a debt security combined with a derivative such as forward, swap, or option. Historically, the most common form of hybrid security has been the convertible bond. From the beginning of the eighties, however, a new breed of hybrid securities has become very popular, particularly in the US. The distinctive feature of these securities is that the payoffs instead of being related to the stock price of the issuing company (as is the case with a convertible bond), are linked to some general economic variable like the interest rate, exchange rate, commodity price, stock market index, and so on.

Hybrids are essentially devices for managing risk. Examples of different types of hybrids are given below:

Hybrids to manage commodity risk— This hybrids includes a zero coupon bond and a call option. This type of hybrid issued in 1986.

Hybrids to manage foreign exchange risk— This is the dual currency bond which includes principle amount in one currency and interest in other country currency.

Hybrids to manage interest rate risk— This hybrid is divides into two parts. They are:

1. A Floating rate bullet repayment note and

2. A plain interest swap for double the principle.

Illustration 1 :

A company is considering taking up of one of the two projects A and B. both projects have the same life, require equal investment of Rs.80 crores each and both are estimated to have almost the same yield. As the company is new to this type of business, the cash flows arising from the projects cannot be estimated with certainty. An attempt was, therefore, made to use probability to analyse the pattern of cash flow from either project during the first year of operation. This pattern is likely to continue during the life of these projects. The results of the analysis are as follows :

Project A Cash flows (Rs. crores)	Probability	Project B Cash flows (Rs. crores)	probability
12	0.1	8	0.1
14	0.2	12	0.25
16	0.4	16	0.30
18	0.2	20	0.25
20	0.1	24	0.10

Which project should the company take up? Show workings to justify your answer.

Calculation of Standard Deviation

Project A

Cash flow(X)	Probability (P)	EV = X × P	$(x - \bar{x})$	$(x - \bar{x})^2$	$P(x - x)^2$
12	0.1	1.2	-4	16	1.6
14	0.2	2.8	-2	4	0.8
16	0.4	6.4	0	0	0
18	0.2	3.6	2	4	0.8
20	0.1	2.0	4	16	1.6
80		EV=16.00			Variance = 4.8

$\bar{x} = 80 / 5 = 16$

Standard deviation of Project $A = \sqrt{4.8} = $ Rs. 2.19 crores

Project B

Cash flow(X)	Probability(P)	EV= X × P	$(x - \bar{x})$	$(x - \bar{x})^2$	$P(x - \bar{x})^2$
8	0.10	0.8	-8	64	6.4
12	0.25	3.0	-4	16	4.0
16	0.30	4.8	0	0	0
20	0.25	5.0	4	16	4.0
24	0.10	2.4	8	64	6.4
80		EV=16.0			Variance=20.8

$\bar{x} = 80 / 5 = 16$

Standard deviation of Project $A = \sqrt{20.8} = $ Rs. 4.56 crores

$$\text{Coefficient of variation} = \frac{\text{Standard deviation}}{\text{Expected Value of Profit}} \times 100$$

$$\text{Project } A = \frac{2.19 \times 100}{16} = 13.69\%$$

$$\text{Project } B = \frac{4.56 \times 100}{16} = 28.5\%$$

Analysis : Project B is more risky than project A and the risk involved in it is more than double. Hence Project A is advisable.

Illustration 2 – The management of Power Tech. Ltd. must choose whether to go ahead with either of two mutually exclusive projects A and B. The expected profits are as follows :

Particulars		Profit if there is strong demand	Profit/(loss) if here is weak demand
Option A	(Rs.)	4,000	(1,000)
Option B	(Rs.)	1,500	500
Probability of demand		0.3	0.7

a. What would be the decision based on expected values if no information about demand were available?

b. What is the value of perfect information about demand?

a. If there were no information to help with the decision the project with the higher EV of profit would be selected.

(Rs.)

Probability	Project A		Project B	
	Profit	EV	Profit	EV
0.3	4,000	1,200	1,500	450
0.7	(1,000)	(700)	500	350
1.0		500		800

Analysis : Project B would be selected. This is clearly the better option if demand turns out to be weak. However, if demand were to turn out to be strong, Project A would be more profitable. There is a 30% chance that this could happen.

b. Perfect information will indicate for certain whether demand will be weak or strong. If demand is forecast '*weak*' Project B would be selected. If demand is forecast as '*strong*', Project A would be selected, and perfect information would improve the profit from Rs. 1,500, which would have been earned by selecting B. to Rs. 4,000.

Forecast demand	Probability	Project chosen	Profit	EV of profit
Weak	0.7	B	500	350
Strong	0.3	A	4.000	1,200
EV of profit with perfect information				1,550

The Value of Perfect Information derives from the 0.3 probability that if demand is going to be strong, the information would reveal this fact, and the decision is changed from '*choose B*' to '*choose A*' thereby earning Rs. 2,500 more profit. The EV of the Value of Perfect Information is therefore 0.3×Rs. 2,500 = Rs. 750. Another way of making this same calculation is as follows :

(Rs.)

EV of profit without Perfect Information (*i.e.*, choose B all the time)	800
EV of profit with Perfect Information	1,550
Value of Perfect Information	750

Analysis : Provide that the information does not cost more than Rs. 750 to collect, it would be worth having.

Illustration 3 – A manager is trying to decide which of three mutually exclusive projects to undertake. Each of the projects could lead to varying net profits which are classified as outcomes I, II and III. The manager has constructed the following pay-off table or matrix (a conditional profit table).

Net profit if outcome turns out to be :

Project	*I*	*II*	*III*
A	50,000	65,000	80,000
B	70.000	60 ,000	75,000
C	90,000	80,000	55,000
Probability	0.2	0.6	0.2

Which project should be undertaken?

If the project with the highest EV of profit were chosen, this would be project C.   (Rs.)

Outcome	*Probability*	*Project A* *EV*	*Project B* *EV*	*Project C* *EV*
I	0.2	10.000	14,000	18,000
II	0.6	39,000	36.000	48,000
III	0.2	16.000	15,000	11,000
	1.0	65,000	65,000	77,000

However, if the maximum criterion were applied, the assessment would be as follows :

Project Selected	*The worst outcome* *that could happen*	*Profit (Rs.)*
A	I	50,000
B	II	60,000
C	III	55,000

Analysis : By choosing B, we are '*guaranteed*' a profit of at least Rs. 60,000, which is more than we would get from project A or C if the worst outcome were to occur for them. The decision would therefore be to choose project B.

IlIustralion 4 – XYZ Ltd. is considering a project with the following expected cash flows. Initial investment Rs. 1,00,000 Expected cash inflows 1st year Rs. 70,000; 2nd year Rs. 60,000; 3rd year Rs. 45,000. The cost of capital is 10%. Due to uncertainly of future cashflows, the management decides to reduce the cash inflows to certainty equivalent by taking only 80%, 70% and 60% respectively. Is it worth while to take up the project?

Calculation of Certainty Equivalents of Cash Inflow :

Ist year	70,000 × 80/100	=	Rs. 56.000
2nd year	60,000 × 70/100	=	Rs, 42,000
3rd year	45.000 × 60/100	=	Rs. 27,000

Calculation of Risk Adjusted NPV of the Project :

Year	Cash flow (Rs.)	P.V. factor (10%)	P.V. (Rs.)
0	(1,00,000)	1.000	(1,00,000)
1	56,000	0.909 $\left(\dfrac{1}{1.10}\right)$	50,904
2	42,000	0.826 $\left(\dfrac{1}{1.10}\right)^2$	34,692
3	27,000	0.751 $\left(\dfrac{1}{1.10}\right)^3$	20,277
			NPV = 5,873

Decision : The NPV of the project is positive and therefore, the project can be selected.

Illustration 5 – A Production Manager is planning to produce a new product and he wishes to estimate the raw material requirement for that new product. On the basis of usage for a similar product introduced previously, he has developed a frequency distribution of demand in tonnes per day for a two month period. Use this data to simulate the raw material usage requirements for 7 days. Compute also expected value and comment on the result.

Demand Tonnes/day	Frequency No. of days
10	6
11	18
12	15
13	12
14	6
15	3

Demand Tonnes/day	Frequency No. of days	Probability	Cumulative Probability	Random Numbers
10	6	0.10	0.10	00-09
11	18	0.30	0.40	10-39
12	15	0.25	0.45	40-64
13	12	0.20	0.85	65-84
14	6	0.10	0.95	85-94
15	3	0.05	1.00	95-99
	60	1.00		

The first seven random numbers (two digits only) are simulated :

Random No.	Corresponding demand Tonnes/day
27	11
13	11
80	13
10	11
54	12
60	12
49	12
	82

Mean requirement per = 82 / 7 = 11.7 Tonnes

The expected value (EV) = (10×0.1)+(11×0.3)+(12×0.25)+(13×0.2)+(14×0.1)+(15×0.05)

= 12.05 Tonnes

The difference = 12.05 - 11.7 = 0.35

This indicate that the small sample size of only 7 days had resulted in some error. A much larger sample should be taken and several samplex should be simulated before the simulation results are used for decision making.

Illustration 6 – The Financial Controller of Super Stocks Ltd. has drawn the following projections with probability distributions :

Wages & salaries (Rs. '000)	Probability	Raw material	Probability	Sales revenue	Probability
10 - 12	0.3	6 - 8	0.2	30 - 34	0.1
12 - 14	0.5	8 - 10	0.3	34 - 38	0.3
14 - 16	0.2	10 - 12	0.3	38 - 42	0.4
		12 - 14	0.2	42 - 46	0.6

Your are required to simulate the cash flow projecton from the following random numbers :

Wages and salaries	2	7	9	2	9	2
Raw materials	4	4	1	0	3	4
Sales Revenue	0	6	6	8	0	2

Simulation of Cash Flow Projection

Random Number Allocation

Wages and Salaries			Raw Materials			Sales Revenue		
Midpoint (Rs. '000)	Cum. Prob.	Random Nos.	Midpoint (Rs. '000)	Cum. Prob.	Random Nos.	Midpoint (Rs. '000)	Cum. Prob.	Random Nos.
11	0.3	0-2	7	0.2	0-1	32	0.1	0
13	0.8	3-7	9	0.5	2-4	36	0.4	1-3
15	1.0	8-9	11	0.8	5-7	40	0.8	4-7
			13	1.0	8-9	44	1.0	8-9

Simulation of Cash Flow *(Rs. '000)*

Month	Wages & salaries	Raw materials	Sales revenues	Fixed costs	Net Cash flow	Cash balance (O B Rs.50)
1	11	9	32	14	−2	48
2	13	9	40	14	+4	52
3	15	7	40	14	+4	56
4	11	7	44	14	+12	68
5	15	9	32	14	−6	62
6	11	9	36	14	−2	60

From the above simulation it will be observed that there are 3 months which have net cash outflows, the probability of net cash outflows can therefore be estimated as 3/6=0.5. From the above table, the estimated cash balance at the end of sixth month is Rs. 60,000.

(b) Expected Value Method of Cash Flows Projection

EV of salaries and wages	= (11×0.3)+(13×0.5)+(15×0.2)	= 12,800
EV of Raw materials	= (7×0.2)+(9×0.3)+(11×0.3)+(13×0.2)	= 10,000
EV of sales revenue	= (32×0.1)+(36×0.3)+(40×0.3)+(44×0.2)	= 34,800
Expected net cash inflow per month	= 34,800–12,800–10,000–14,000	= Rs. 2,000
Expected net cash inflow per month	= 50,000 + (2,000×6)	= Rs. 62,000

The difference between Rs. 60,000 and rs. 62,000 is due to sample errors. If a number of simulation iterations were carried out then the mean of the balances predicted should approach the expected value more and closely as the number was increased.

Illustration 7 – Infoway Ltd. is considering the purchase of an automatic pack machine to replace the 2 machines which are currently used to pack Product X. The new machine would result in reduced labour costs because of the more automated nature of the process and in addition, would permit production levels to be increased by creating greater capacity at the packing stage with an anticipated rise in the demand for Product X, it has been estimated that the new machine will lead to increased profits in each of the next 3 years. Due to uncertainty in demand however, the annual cash flows (including savings) resulting from purchase of the new machine cannot be fixed with certainty and have therefore, been estimated probabilically as follows :

Annual Cost Flows :

Year 1	Probability	Year 2	Probability	Year 3	Probability
10	0.3	10	0.1	10	0.3
15	0.4	20	0.2	20	0.5
20	0.3	30	0.4	30	0.2
		40	0.3		

Because of the overall uncertainty in the sales of Product X, it has been decided that only 3 years cash flows will be considered in deciding whether to purchase the new machine. After allowing for the scrap value for the existing machines, the net cost of the new machine will be 42,000. The effects of taxation should be ignored.

Required :

a. Ignoring the time value of money, identify which combinations of annual cash flows will lead to an overall negative net cash flow, and determine the total probability of this occurring.

b. On the basis of the average cost flow for each year, calculate the net present value of the new machine given that the company's cost of capital is 15%. Relevant discount factors are as follows :

Year	Discount factor
1	0.8696
2	0.7561
3.	0.6575

c. Analyse the risk inherent in this situation by simulating the net present value calculation. You should use the random number given at the end of the illustration in 5 sets of cash flows. On the basis of your simulation results what is the expected net present value and what is the probability of the new machine yielding a negative net present value ?

	Set 1	Set 2	Set 3	Set 4	Set 5
Year 1	4	7	6	5	0
Year 2	2	4	8	0	1
Year 3	7	9	4	0	3

a. If the total cash inflow in years 1, 2 and 3 is less than Rs. 42,000, the net cash flow will be negative. The combinations of cash flow which total less than Rs. 42,000 are given in table below :

Cash flow (Rs. '000)

Year 1	Year 2	Year 3	Total	Probability
10	10	10	30	0.3×0.1×0.3 = 0.009
10	10	20	40	0.3×0.1×0.5 = 0.015
10	20	10	40	0.3×0.2×0.3 = 0.018
15	10	10	35	0.4×0.1×0.3 = 0.012
20	10	10	40	0.3×0.1×0.3 = 0.009
				Total = 0.063

The probability of a negative cash flow is 0.063

b. Expected cash flow = Σ [Cash flow×Probability]

	(Rs. '000)
Year 1 EV = (10×0.3) + (15×0.4) + (20×0.3)	15
Year 2 EV = (10×0.1) + (20×0.2) + (30×0.4) + (40×0.3)	29
Year 3 EV = (10×0.3) + (20×0.5) + (30×0.2)	19

P.V. of the cash = (15×0.8696) + (29×0.7561) + (19×0.6575) = 47.4634

The net present value of the new machine = 47,463 – 42,000 = Rs. 5,463

c. Allocate random number ranges to the cash flows for each year.

	Cashflow (R. '000)	Probability	Cumulative Probability	Random number
Year 1	10	0.3	0.3	0-2
	15	0.4	0.7	3-6
	20	0.3	1.0	7-9
Year 2	10	0.1	0.1	0
	20	0.2	0.3	1-2
	30	0.4	0.7	3-6
	40	0.3	1.0	7-9
Year 3	10	0.3	0.3	0-2
	20	0.5	0.8	3-7
	30	0.2	1.0	8-9

We can now carry on the simulation. *(Rs. 000)*

	Year 1				Year 2				Year 3		
Number	*Random*	*Cash*	*DCF*	*Random*	*Cash*	*DCF*	*Random*	*Cash*	*DCF*	*Net PV*
1	4	15	13.044	2	20	15.122	7	20	13.150	-1.684
2	7	20	17.392	4	30	22.683	9	30	19.725	17.800
3	6	15	13.044	8	40	30.244	4	20	13.150	14.438
4	5	15	13.044	0	10	7.561	0	10	6.575	-14.820
5	0	10	8.696	1	20	15.122	3	20	13.150	-5.032
									Total	11.702

The average net present value of the cash flow = 11,702/5 = Rs. 2,340.40

Thre out of the five simulations produced negative NPV, therefore, we estimate the probability of a negative NPV as 3/5=0.6. Since the simulation is small, the estimates are unlikely to be reliable.

Illustration 8 – A Research project of Continental Fibers Ltd. is in progress with a view to developing a new product for commercial launch. There are several aspects to this issue.

1. The project may be aborted or it may be allowed to continue.

2. If it is continued it may or may not result in a potentially marketable new product.

3. If it does result in a marketable product the organisation may choose to launch it immediately or to postpone the launch.

4. Competitors may or might be able to match the organisation's endeavours.

The Manager represent points at which decisions need to be made, while the circles represent subsequent events. It can be seen that each decision, combined with the states of nature that are assumed to prevail, produces distinct outcomes.

The next step is to introduce quantitative data, so let us assume the following :

a. It will cost an estimated Rs. 50,000 to continue the project which is itself probabilistic.

b. If the Company decides to postpone the launch of the product (assuming the project is successful) and competitors enter the market there will be a loss of current business amounting to Rs. 1,25,000.

c. If the project is successful and an immediate launch is undertaken, the company will generate incremental cash flows of Rs. 4,50,000 if competitiors stayout of the market, but only Rs. 2,50,000 if competitors enter the market.

Taking the branch dealing with the immediate launch of a successful project as an example, the expected value is derived as follows :

(Rs.)

2,50,000×0.7	1,75,000
4,50,000×0.3	1,35,000
Expected value	3,10,000

The expected value for continuing the project of Rs. 1,56,000 calculated as follows :

(Rs.)

3,10,000×0.6	1,86,000
(–) 75,000×0.4	(30,000)
Expected value	1,56,000
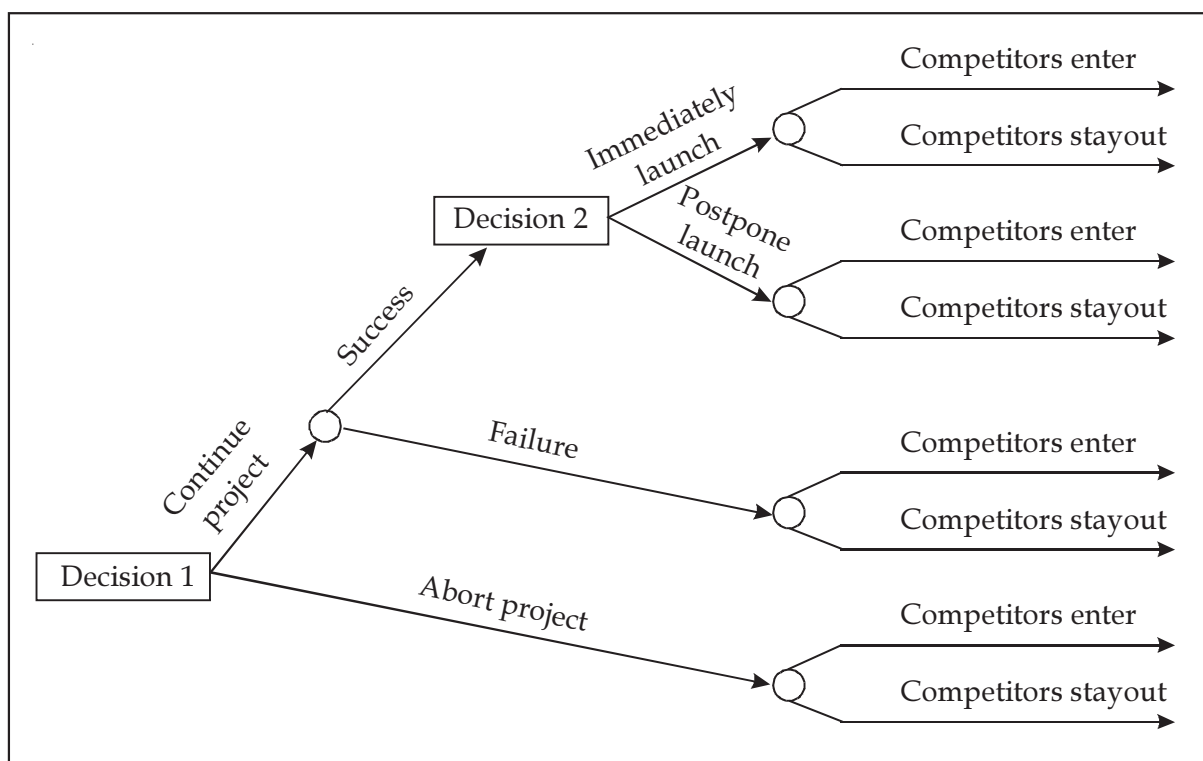
FIGURE 1 : BASIC DECISION TREE
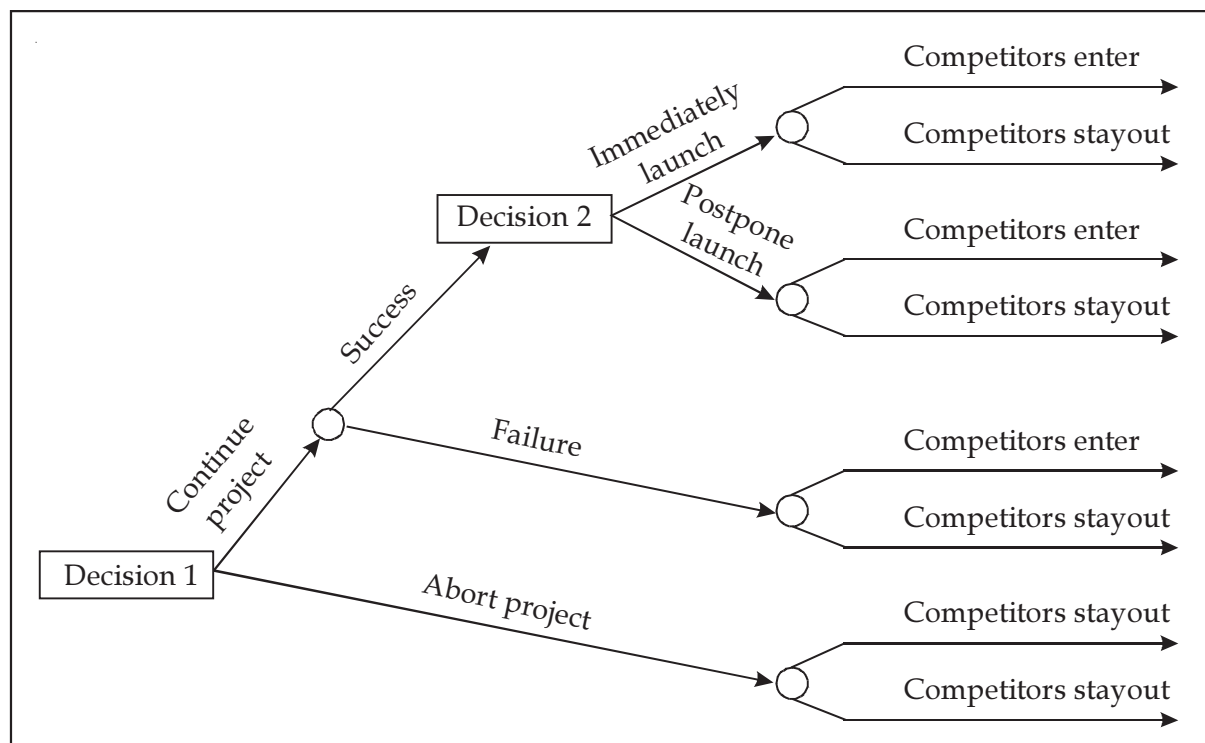
FIGURE 2 : DECISION TREE WITH QUANTIFIED OUTCOMES

A comparison of this pay-off with the expected value of aborting the project [(–) Rs. 62,500] shows the desirability of continuing with the project.

The decision branches will be drawn as broken lines emerging from square nodes and the outcomes of a trail as solid lines emerging from round nodes. The square nodes, from which the decision brances are drawn, represent the points at which decision maker selects his decision. The round nodes represents the points at which the outcome of the decision arises. The decision maker has no control over the outcome and can only estimate the probability of the various outcomes actually occurring. When all of the decisions and outcomes have been represented on the tree, each of the possible routes through tree is considered and the monetary payoff is shown at the end of each route. Any costs incurred by the decisions are indicated along the appropriate branches.

Where,

RRR_p = Required rate of return on the project

R_t = Risk free rate of return

R_m = Market return

= Project beta

Illustration 9 – A project had an equity beta of 1.2 and was going to be financed by a combination of 30% debt and 70% equity (assume debt beta = 0). Calculate the Project Beta. Assume R_t = 10% and R_m = 18%.

$$\beta_2\,D = \left(\beta\,\text{Equity} \times \frac{E}{D+E}\right) + \left(\beta\,\text{debt} \times \frac{D}{D+E}\right)$$

$$= (1.2 \times 0.70) + (0 \times 0.30) = 0.84$$

$$RRR_2 = R_t + \beta_p\,(R_m - R_t)$$

$$= 10\% + 0.84\,(18\% - 10\%) = 10\% + 6.72\% = 16.72\%$$

So, the riskness of this investment suggests that the project should earn a required rate of return of about 16.7%.

Many companies introduce the concept of discounting risky cashflows at different rates when they introduce variable risk premiums for different types of investments. They set different required rates of return, or hurdle rates, for their investment projects depending on the nature of the investment. This is usually in the form of a premium on what is considered the basic company cost of capital. In some cases they take the four broad categories of investment projects and they assess the degree of risk generally associated with each type of investment. Thus a company may set up a decision rule which gives the following risk premiums :

1. Safety and maintenance investments (financing decision) - *no*

    risk as it is simply a financing decision to choose the investment

    with the lowest cost   = Zero risk premium

2. Cost-saving investments - *low risk*   = 3% risk premium

3. Expansion investments - *moderate risk* as taking existing products

    into new markets or new products into existing markets   = 6% risk premium

4. Diversilicauon investments - *high risk* as expanding with new

    products into new markets   = 9% risk premium

Sometimes the decision rule will not be on the basis of what type of investment it is, but rather on a subjective measure of how risky the investment is. For example. all new investments in a company could be divided into high risk investments with a risk premium of 9 per cent ; moderate risk investments, with a risk premium of 6 per cent ; low risk with a risk premium of 3 per cent ; and finally those investments with zero risk which are discounted at the company cost of borrowing.

The *CAPM approach* provides a theoretically correct, comprehensive approach to *risk-adjusted RRR* determination. However, the model's assumptions have been criticised as unrealistic and it is complex to use and relies on the availability and accuracy of much information which is external to the organisation.

Illustration 10 – A publishing house has brought out a new monthly magazine which sells at Rs.25 per copy. The cost of production it is Rs.20 per copy. A news stand estimates the sales pattern

of the magazine as under:

Demand copies	Probability
0 < 200	0.18
200 < 400	0.32
400 < 600	0.25
600 < 800	0.15
800 < 1000	0.06
1000 < 1200	0.04

The news stand has contracted for 500 copies of the magazine per month from the publisher. The unsold copies are returnable to the publisher who will take them back at cost less Rs. 2 per copy for handling charges.

The news stand manager wants to simulate the pattern of demand and profitability. The following random number may be used for simulation:

27	15	56	17	98	71
51	32	62	83	96	69

You are required to:

(i) Allocate random numbers to the demand pattern forecast by the news stand.

(ii) Simulate twelve months sales and calculate the monthly and annual profit / loss.

(iii) Calculate the loss on sales.

(a) Profit per copy of the magazines = 25 - 20 = Rs. 5. If unsold copy is returned, loss per copy = Rs. 2.

(i) Allocation of Random Numbers

Demand	Probability	Cumulative probability	Random Nos. allocated
0 < 200	0.18	0.18	00 - 17
200 < 400	0.32	0.50	18 - 49
400 < 600	0.25	0.75	50 - 74
600 < 800	0.15	0.90	78 - 89
800 < 1000	0.06	0.96	90 - 95
1000 < 1200	0.04	1.00	96 - 99

(ii) Simulation of monthly pattern of demand and profitability

Month Numbers	Random	Demand copies	Sales copies	Returned sales	Profit on sales	Loss on return	Net profit/ loss	Lost sales copies
					Rs.		Rs.	
1	27	300	300	200	1,500	400	1,100	-
2	15	100	100	400	500	800	(300)	-
3	56	500	500	-	2,500	-	2,500	-
4	17	100	100	400	500	800	(300)	-
5	98	1100	500	-	2,500	-	2,500	600
6	71	500	500	-	2,500	-	2,500	-
7	51	500	500	-	2,500	-	2,500	-
8	32	300	300	200	1,500	400	1,100	-
9	62	500	500	-	2,500	-	2,500	-
10	83	700	500	-	2,500	-	2,500	200
11	96	1100	500	-	2,500	-	2,500	600
12	69	500	500	-	2,500	-	2,500	-
					24,000	2,400	21,600	1,400

(ii) Loss due to lost sales = 1400 copies × Rs. 5 = Rs. 7,000

Illustration 11 – A company manufacture 30 items per day. The sale of these items depends upon demand which has the following distribution:

Sales (Units)	27	28	29	30	31	32
Probability	0.10	0.15	0.20	0.35	0.15	0.05

The production cost and sale price of each unit are Rs. 40 and Rs. 50 respectively. Any unsold product is to be disposed off at a loss of Rs. 15 per unit. These is penalty of Rs. 5 per unit if the demand is not met.

Using the following random numbers estimate total / loss for the company for next 10 days : 10, 99, 65, 99, 95, 01, 79, 11, 16, 20

If the company decides to produce 29 items per day, what is the advantage to the company?

Alignment of Random Numbers

Sales (Units)	Probability	Cumulative probability	Random numbers assigned
27	0.10	0.10	00 - 09
28	0.15	0.25	10 - 24
29	0.20	0.45	25 - 44
30	0.35	0.80	45 - 79
31	0.15	0.95	80 - 94
32	0.05	1.00	95 - 99

Let us now simulate the demand for next 10 days using the given number in order to estimate the total profit /loss for the company. Since the production cost each item is Rs. 40 and sale price is Rs. 50,

therefore the profit per unit of the sold item will be Rs. 10. Therefore is a loss of Rs. 15 per unit associated with each unsold unit and penalty of Rs. 5 per unit if the demand is not met. Accordingly, the

profit/loss for next ten days are calculated in column (iv) of the table below if the company manufacture 30items per days.

Day	Random number		Estimated Profit/Loss per day when saleproduction = 30 items per day	Profit/Loss per day when production = 29 items per day
1	10	28	(28 X 10) -(2 X 15) = 250	(28 X 10) -(1X 15) = 265
2	99	32	(30 X 10) -(2 X 5) = 290	(32 X 10) -(3 X 5) = 275
3	65	30	(30 X 10) = 300	(30 X 10) -(1 X 5) = 285
4	99	32	(30 X 10) -(2 X 5) = 290	(32 X 10) -(3 X 5) = 275
5	95	32	(30 X 10) -(2 X 5) = 290	(32 X 10) -(3 X 5) = 275
6	01	27	(27 X 10) -(3 X 15) = 225	(27 X 10) -(2 X 15) = 240
7	79	30	(30 X 10) = 300	(29 X 10) -(1 X 5) = 285
8	11	28	(28 X 10) -(2 X 15) = 250	(28 X 10) -(1X 15) = 265
9	16	28	(28 X 10) -(2 X 15) = 250	(28 X 10) -(1X 15) = 265
10	20	28	(28 X 10) -(2 X 15) = 250	(28 X 10) -(1X 15) = 265
Total Profit			Rs. 2695	Rs. 2695

The total profit for next 10 days will be Rs. 2695 if the company manufacture 30 items per day. In case, the company decides to produce 29 items per day, then the profit of the company for next 10 days is calculated in column (v) of the above table. It is evident from this table that there is no additional profit or loss if the production is reduced to 29 items per day since the total profit remains unchanged i.e Rs. 2695.

Illustration 12 – A company uses a high grade raw material. The consumption pattern is probabilities as given below and it takes two months to replenish stocks :

Consumption per month (tons)	1	2	3	4
Probability	0.15	0.30	0.45	0.10

The cost of placing an order is Rs.1,000 and the cost of carrying stocks is Rs. 50 per month per ton. The average carrying costs are calculated on the stocks held at the end of each month.

The company has two options for the purchase of raw materials as under :

Option I. Order for 5 tons when the closing inventory of the month plus outstanding order is less than 8 tons.

Option II. Order for 8 tons when the closing inventory of the month plus outstanding order is less than 8 tons.

Currently in 1st April 2008, the company has a stock of 8 tons of raw materials plus 6 tons ordered two months ago. The order quantity is expected to be received next month.

Using the random numbers given below, simulate 12 months consumption till 31-3-2009 and advise the company as to which purchase option should be accepted such that the inventory costs are minimum.

Random numbers are : 88, 41, 67, 63, 48, 74, 27, 16, 11, 64, 49, 21

Demand (Tons)	Probability	Cumulative Probability	Random Nos. allocated
1	0.15	0.15	00 - 14
2	0.30	0.45	15 - 44
3	0.45	0.90	45 - 89
4	0.10	1.00	90 - 99

Option - I

RN	Demand	Opening Stock	Receipts	Closing Stock	Op. Stock on Order	Order	Cl. Stock on Order
88	3	8	-	5	-	-	6
41	2	5	6	9	-	-	-
67	3	9	-	6	-	5	5
63	3	6	-	3	5	-	5
48	3	3	-	0	5	5	10
74	3	0	5	2	5	5	10
27	2	2	-	0	10	-	10
16	2	0	5	3	5	-	5
11	1	3	5	7	-	5	5
64	3	7	-	4	5	-	5
49	3	4	-	1	5	5	10
21	2	1	5	4	5	-	5
				44			

(Rs.)

No. of order placed 5 Ordering cost (5 × 1000) 5,000

Closing stock 44 Carrying cost (44 × 50)   2,200

Total Cost   7,200

Option - II

RN	Demand	Opening Stock	Receipts	Closing Stock	Op. Stock on Order	Order	Cl. Stock on Order
88	3	8	-	5	-	-	6
41	2	5	6	9	-	-	-
67	3	9	-	6	-	8	8
63	3	6	-	3	8	-	8
48	3	3	-	0	8	-	8
74	3	0	8	5	-	8	8
27	2	5	-	3	8	-	8
16	2	3	-	1	8	-	8
11	1	1	8	8	-	-	-
64	3	8	-	5	-	8	8
49	3	5	-	2	8	-	8
21	2	2	-	0	8	-	8
				47			

(Rs.)

		(Rs.)
No. of order 3	Ordering cost (3 × 1000)	3,000
Closing stock 47	Carrying cost (47 X 50)	2,350
	Total	5,350

Analysis : Since the cost of inventory is less in Option II, it is suggested to implement.

Study Note - 7
PROJECT MANAGEMENT

7.1 Project Identification and Formulation

This Section includes :

- **Project Definition & Characteristics**
- **Project Life Cycle**
- **Steps in Project Management**

INTRODUCTION :

A project is for setting up a plant and when the plant becomes operational, the project is treated as completed. A project is neither a physical objective nor is it the end-result. It has something to do with the activities that go on, which must be the same, whether it is to build a nuclear power plant or launching a new detergent.

A project first emerges as a concept and follows various stages, till it gets commissioned. From the point of concept to commissioning, varying data-flow is required at the right time to the right people. Project management envisages meticulous planning, effective implementation and professional management to achieve the management of time, cost and performance. Scientific techniques of project management can play a major role in streamlining the management of projects.

PROJECT DEFINITION & CHARACTERISTICS :

A project is defined as "a non-routine-repetitive one-off undertaking normally with discrete time, financial and technical performance goals". The definition is descriptive and, because of the endless variety of projects, most of the definitions are of this nature. As, another: 'A project can be considered to be any series of activities and tasks that:

- have a specific objective to be completed within certain specifications;
- have defined start and end dates;
- have funding limits (if applicable); and
- consume resources (i.e. money, time, equipment).

On perusal of the multifarious definitions on the subject, our definition is:

Project is a scheduled set of activities aimed towards the creation of particular asset as per planned specifications, with a view to generate wealth – as estimated – for coming years.

A project is a "one shot" major undertaking. For example, a thermal power project. Even when another thermal power project is undertaken, it will be different from the previous one. In another words, the term 'project' may be common, but the 'plants' are not.

A project has several characteristics. The characteristic features of a project are briefly described below:

a) A project has a mission or a set of objectives. Once the mission is achieved the project is treated as completed.

b) A project has to terminate at some time or the other; it cannot continue forever. The set of objectives indicate the terminal stage of the project.

c) While the numbers of participants in a project are several, the project is one single entity and its responsibility is assigned to one single agency.

d) A project calls for team-work the members of the team may come from different organizational units, different disciplines, and even from different geographic regions.

e) A project has a life cycle represented by growth, maturity and decay. A project has a learning component.
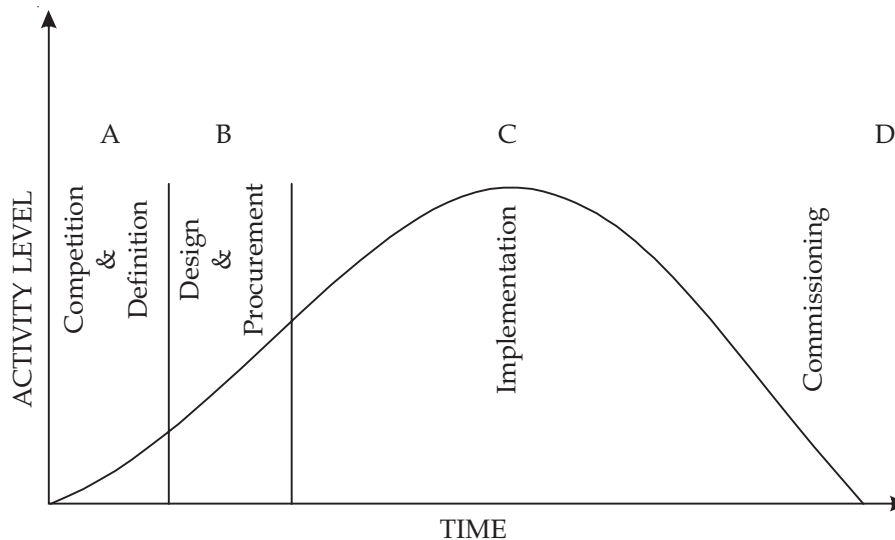
f) A project is unique and no two projects are similar, even though the plants set up are identical. The organizations, the infrastructure, the location and the people make the project unique.

g) Change is a natural phenomenon with every project throughout its life span. Some changes may not have any major impact, but some others may change the very nature of the project.

h) The happenings during the life cycle of a project are not fully known at any stage. As time passes, the details are finalized successively. For example, more details are known about the project at the erection stage than at the detailed engineering stage.

i) A project is always customer-specific. The requirements and constrains within which a project must be executed are stipulated by the customer.

j) A project is a complex set of things. Projects vary in terms of technology, equipment and materials, machinery and people, work ethics and organizational culture.

k) A substantial portion of the work in a project is done by sub-contracting. The greater the complexity of a project, the greater will be the extent of work performed by subcontractors.

l) Any project is exposed to risk and uncertainty and the extent of these two depend upon has the project moves through the various stages in its life span. A well defined project has lesser risk and uncertainty, whereas an ill-defined project faces greater degree of risk and uncertainty.

The types of projects that are ventured by organizations could broadly be classified as:

a) New projects

b) Expansion projects

c) Modernization projects

d) Diversification projects

e) Other projects

PROJECT LIFE CYCLE :

A project consists of sequential phases and these phases are extremely useful since they provide a framework for budgeting manpower and resource allocation and for scheduling project milestones and project reviews. Although the phases in a life cycle are said to be sequential, there maybe some overlap between them, especially in the case of large and complex projects. The method of dividing the phases in a project may differ some what from industry to industry and from product to product. A particular phase in a project's life cycle may require more attention than some other phase. The various phases in a project, which are by and large common to many projects, are the following:

a) Concept or initialization phase

b) Project definition phase

c) Growth or organization phase

d) Implementation phase

e) Project shutdown or cleanup phase

Concept or Initialization Phase

In the concept or initialization phase, the project idea emerges and the management decides on the need for a project.

Neither the importance of the concept and initialization phase can be minimized, nor it can be totally ignored; otherwise the inherent defects in the project may eventually become a

liability for the investors. The implementation aspects should not be considered at all in this phase of project life cycle. Undoubtedly a project which is well conceived can be later implemented successfully. It is to be expected that the ideas may undergo changes as the project progresses. This is natural, because at the concept stage event data is not available and the actual real life situation may turn out to be different from what has been assumed initially.

Project Definition Phase

- The techno-economic viability of the project
- The technical configuration of the project
- The performance requirements, sub-systems, key equipments etc.
- The cost estimates with limits
- Schedule of implementation

The details to be covered and documented will include :

a)	Raw materials	Qualitative and quantitative evaluation of each of the raw materials required.
b)	Plant capacity	Description of the plant requirements and their capacities for each of the departments as well as the entire plant.
c)	Location and site	The actual place where the plant is to be built in city / town.
d)	Technology/process	Description of the selected technology and the reasons as to why this particular technology is selected.
e)	Plant and machinery	Description of the equipment and, giving reasons for the same, along with specification, type, quantity etc.
f)	Electrical & Instrumentation	Description of major electrical and instrumentation items with features, and a scheme for power distribution and power grid map.
g)	Civil engineering works	Description of civil works to be carried out with justification and cost estimates
h)	Utilities	Description of utilities – power, water, steam oxygen, etc.- required quantities and qualitative properties, sources, availability and unit costs.
i)	Manpower	Organisation structure, labour and staff required skill wise, availability, labour rates etc.
j)	Financial analysis	Total investment, sources from which required finance can be raised, total production costs, and evaluation of financial viability.
k)	Implementation schedule	Describe how the project is to be implemented, clarifying the uncertainties and ambiguities noted at the concept state. The risk associated with the project is also stated.

Growth or Organisation Phase

This phase starts soon after the concept phase and simultaneously with the definition phase and the subsequent implementation phase. Many organizations, during this phase, undertake the following actions :

a) Establishing the infrastructure and enabling services for the project

b) Project engineering and design

c) Setting up Project Organisation and staffing

d) Appointing a project manager

e) Preparing schedules and budgets

f) Obtaining necessary licenses and clearances from the Government

g) Raising finance

h) Developing systems and procedures for monitoring and reviewing project progress

i) Procedures for inviting tenders and awarding contracts

j) Site preparation and development

k) Procuring construction equipment and materials

l) Work packaging.

This phase covers not only paper work connected with project planning, but also implementation activities. Planning is necessary to avoid crisis management; it makes the implementation phase to run smooth.

Implementation Phase

These activities include

1) The preparation of specifications for major equipments and machineries,

2) Placing orders with vendors for the supply of equipments and machineries,

3) Inviting contractors to submit bids,

4) Evaluating contractors bids and selecting contractors,

5) Preparing and issuing construction drawings,

6) Civil constructions and construction of equipment foundations,

7) Erection of equipment and machinery,

8) Installation of electrical fittings,

9) Piping,

10) Instrumentation,

11) Testing and trail runs, and

12) Commissioning of the plant.

Approximately 75 to 85% of the project work is done in this phase. Naturally, people are interested in starting this phase as early as possible, and also complete this phase within as short a time as possible.

There is need for a high degree of co-ordination and control in this phase. Once the decision is taken and the project begins, everybody is anxious to avoid any loss of time.

Project Shut-down and Clean-up Phase

In this phase, the plant and machinery built and erected with the active involvement of several agencies, handed over for production to a different agency who was not involved earlier. The project personnel catalogue all drawings, documents, specifications, operation and maintenance manuals and hand over to operating personnel. They have to be satisfied with guaranteed-test runs. Any change required at the last minute for fulfillment of contractual obligations with regard to performance has to be completed satisfactorily in this phase. Project accounts are finalised, materials reconciliation carried out, all outstanding dues are paid during the phase.

STEPS IN PROJECT MANAGEMENT :

Project management consists of the following steps:

- Combining activities into "Work packages", which have the features of a project i.e., the work packages are related to one another, and they all contributes to the same goal(s), and bound by time, cost and performance targets.

- Entrusting whole project to a single responsibility centre called the "Project Manager" for coordinating, directing and controlling the project.

- Choosing a suitable organisation structure to support and service the project internally, and through vendors and contractors externally.

- Building up commitment through negotiations, coordinating and directing towards goals through schedules, budgets and contracts.

- On the basis of schedules, budgets and contracts, ensuring that goals are achieved through continuous monitoring and control.

7.2 Identification of Project Opportunities

This section includes:

- **Project Environment**
- **Project Objectives**
- **Project Classification**
- **Sources of Project Ideas**

INTRODUCTION :

An entrepreneur desirous of investing on a project has to look for suitable opportunities. The vast range of opportunities makes the task of identification very difficult. The task of identifying suitable project for investments is prima facie concerned with feasible and promising ones which deserve further in-depth study and appraisal. The study has a very wide choice and the dimensions of the choice are:

- Product / service
- Technology
- Equipment
- Scale of production
- Market
- Time phasing
- Location

PROJECT ENVIRONMENT :

An important aspect of the business environment affecting investment opportunities is the Govt.'s policy framework seeks to –

   i)   define available opportunities for investment to different types of entrepreneur,

   ii) encourage and promote investments along certain lines through incentives, concessions and reliefs, and

   iii) specify the kinds of operational controls exercised by the Govt. over the functioning of industrial enterprises.

The major components of the Governmental policy framework are the industrial policy, Industries (Development and Regulation) Act, regulation on foreign collaboration and investment, FEMA, MRTP Act, incentives for export oriented units.

Industrial Policy

The Government's industrial policy, content in the industrial policy resolution of 1956, envisages a mixed economy. Policy statements in subsequent periods reaffirmed the original

policy, except some changes in emphasis. Under the mixed economy where the state and the private sector have a role to play, the industries have been divided into three categories:

(a) Industries reserved for the public sector are in Schedule A. They include infrastructure industries such as power, rail and certain basic and heavy industries such as defense oriented industries and atomic energy.

(b) Industries in which the state will generally take the initiative to establish new undertakings but in which private enterprise will supplement the efforts of the state are Schedule B. They include Aluminium, Machine tools, Drugs, Antibiotics and Plastics.

(c) All other industries are left for the private sector to develop and run them.

Industries (Development and Regulation) Act

The provisions in this Act relevant to the projects include:

● Licenses are required for setting new industry and / or substantially expanding the capacity of an existing organisation.

● License is granted on the basis of the industrial policy on furtherance of employment, export, balanced regional development etc.

● No license is required for SSI units.

● Govt. is empowered by this Act to
    i)   investigate any industry
    ii) issue direction for improvement of management
    iii) fix prices production method etc.

MRTP Act

The principle objectives sought to be achieved through MRTP Act are:

● Prevention of concentration of economic power to the common detriment.

● Control of monopolies

● Prohibition of monopolistic, restrictive and unfair trade practices.

Incentive for Industries

With the objectives of rapid industrial growth as well as decentralization, the Government has introduced a number of incentives, which include the following:

● Incentive for export oriented units

● Incentive for backward areas

● Incentive for Small Scale Units

Incentive for Export Oriented Units

Export oriented units are allowed the following incentives:

(a) A higher percentage of foreign equity is generally permitted for units which have an export commitment of over 60% of their production.

(b) Liberal import facilities, depending on the actual import content of the product and FOB value of the product are allowed.

(c) Customs and central excise duties paid on raw materials used for the manufacture of the export product are reimbursed.

(d) Raw materials are supplied at controlled prices for specified export products.

Incentive for backward areas

In order to remove regional imbalance and develop areas lacking industrial activities the Govt. made a list of such areas considered as "backward" and provides incentives which include-

(a) Govt. subsidy-which should be retained in the business i.e., not be treated as revenue income.

(b) The financial institutions provide soft loans with lower rate of interest and longer repayment time.

(c) There are various types of transport subsidies for the transport of raw material as well as finished goods.

Incentive for Small Scale Units

Govt. encourages establishment of SSI units to facilitate promoters. The main criterion to consider an unit as a small scale one was the limit of total investments and this limit has been gradually increased to bring larger no. of units under the SSI with areas of operation exclusively reserved for such units. The different classes of industries are as follows:

(i)   Chemical products

(ii)   Food products

(iii)   Electrical products

(iv)   Electronics products

(v)   Mechanical products

(vi)   Glass and ceramic products

PROJECT OBJECTIVES :

Project, when finalised, has the following objectives:

- its has a time-bound programme to start, execute, commission and delivery of the project;

- it has cost-bound activities – in terms of money spent or resources consumed – so that total cost is within the total estimated project cost as agreed and authorized by the project owner;

- it shall conform to the technical specifications set at the point of deciding upon the project. In other words, the delivery (of the project) shall have to be of the agreed quality.

A project has primarily three objectives – it is to be implemented within a specified time, at a target estimated cost, to produce certain goods/services of specified quality.

Cost — Quality — Time (project management triangle)
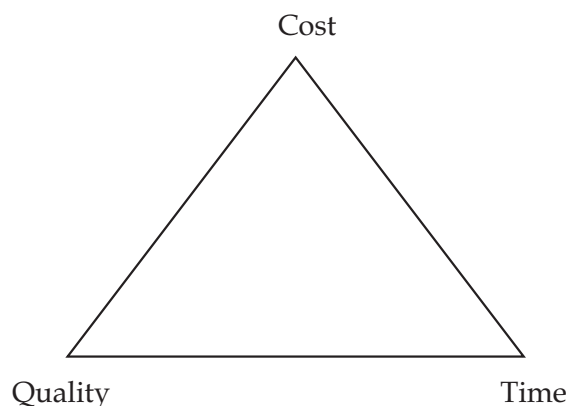
PROJECT CLASSIFICATION :

There are endless varieties of projects. These projects are classified according to the specific character of the project:

(a) Projects of different sectors

Projects can be classified according to the sector to which the project owner belongs.

i. Projects for the public sector are undertaken by Sector Enterprises/ Undertakings (PSE or PSU) which are owned by the government – Central State or both Projects which normally involve largest volume including funds and cover the largest sector of people- e.g. projects under railways, airlines, banks, steel etc., belong to public sector. The State Government undertaking-though comparatively smaller in volume-are, nevertheless, public sector and projects for such organization, e.g. State Transport Corporation etc., are also public sector projects. In such projects, the profit-motive plays a secondary role as the primary cause is to serve the people, create employment etc.

ii. Projects of private sectors: The owners of such projects are individuals or company (private or public but not PSU), partnership firm, where profit-motive against investment plays an important role.

iii. Projects in the joint sector: Here the ownership belongs to a partnership between government undertaking and the private sector. The recent plan to develop the minor port at Gopalpur to a major all-season port at an estimated project cost of Rs. 1,800 crores is envisaged by the Government to be launched by forming a joint venture between the state Government, Mineral and Metal Trading Corporation (MMTC) and from the private sector TISCO. In projects under this sector normally the management expertise is from the private sector and the partner representing the government helps in liaison with various government authorities including large-scale funding.

(b) Industrial and Non-Industrial Projects

We have mentioned earlier about projects which are undertaken without money-making mission and are primarily with social objectives e.g. projects for health care, public education, irrigation etc. These are classified as non-industrial projects mainly undertaken by the government.

Most of the other projects are classified as industrial projects belonging to organizations with commercial objectives.

An industrial organization can stand on its own for longer period when the economy generated by it can sustain the organization. Projects belonging to business organization are undertaken to ensure generation of wealth (during the second part of the project, as mentioned earlier) and are classified as industrial projects.

(c) Projects belonging to core sector

There are complex mega-projects undertaken by the government which, in turn, help to generate commercial activities and, also, many other industrial projects. These are power projects, port facilities, highways, mining, steel etc.,

(d) Need-based projects

We have noted earlier that project grows out of needs or opportunities. Accordingly there are different types of needs leading to different types of projects

Different types of project, classified as per the aim of the projects:

- **Balancing**

It represents a project within an existing plant in order to increase the production capacity of a particular area or areas within the plant, so that a harmony of the production capacity of the entire plant is established.

- **Integrating**

It represents a project within an existing plant to install capacity to produce a new product/ service which in case of:

'Backward integration' are meant for captive consumption in the manufacture of the currently produced finished goods and

'**Forward** integration' are meant for production by the process of consuming the currently produced finished goods.

- **Modernization**

Project for technical up gradation of production plant and / or process.

- **Expansion**

Project for installing capacity to increase the volume of production/service.

- **Diversification**

It represents projects to introduce new product/service in the existing plant.

- **Rehabilitation/reconstruction**

It represents projects to rehabilitate a plant (organization) which is already considered sick.

Taxonomy of projects

Broadly, projects can be categorized as :

- Defensive projects i.e., those aimed to strengthen the present position of the status or situation of product lines, technical services, product or process improvement etc.,

- Aggressive projects, those concerned with giving new ways of service or entering new commercial line or fields, development of innovative products/processes, long range research oriented programmes etc.

In detail, projects could be national or international, industrial or non-industrial, R & D, high technology, conventional technology, low technology projects etc. in a finer categorization, projects could be further classified as major, medium or mini projects. Again they could be grass-root expansion or modification projects. Depending on the speed needed for execution, the projects could be categorized as:

- Normal projects(where adequate time is allowed)

- Crash projects (Where additional cost are concerned to gain time)

- Disaster projects(anything needed to gain time is allowed)

SOURCES OF PROJECT IDEAS :

A variety of sources have to be tapped to stimulate the generation of project ideas.

(a) **Analysis of industries' performance—** An analysis of the capacity utilization and profitability including break-even analysis of existing industries will indicate, promising project opportunities which are relatively risk free and profitable. Capacity utilization analysis of existing industries will provide information about the potential for further investment. Such an analysis, region wise for products with high freight costs will be more useful.

(b) **Analysis of inputs and outputs of industries—** A careful analysis of inputs required for various industries may suggest potential project opportunities, some firms produce internally some components at a high cost. Perhaps these can be produced and supplied at a lower cost enjoying economies of scale. An analysis of the outputs may indicate opportunities for further processing of output or processing of wasters/by – products.

(c) **Analysis of imports and exports—** An analysis of import statistics of past five years helps in understanding the trend of imports of various materials and the potential for import substitution.

   (i) Replacing imports with indigenously manufactured materials is beneficial because it improves the balance of payment situation,

   (ii) It creates employment opportunities and

   (iii) It provides market for supporting industries and service.

Similarly, analysis of export statistics is useful in knowing the export possibilities of various products.

(d) Government's guideline to industries, published annually is available as a source of information to potential entrepreneurs / investors. The guidelines provide information on existing capacities for various items, estimated demand, scope for exports, etc.

(e) **Suggestions of financial institutions and developmental agencies—** State Financial Corporations, State Industrial Development Corporations, and other Development Agencies periodically conduct studies and feasibility reports with a view to promote development of industries in their respective states.

(f) **Survey of local resources—** A survey or investigation of local resources may indicate opportunities for adding value to locally available materials. National Council of Applied Economic Research conducts surveys of various regions in the country throwing light on those regions which have the potential for industrial development.

(g) **Analysis of economic and social trends—** An analytical study of economic and social trends may indicate changes in economic trends which provide new business opportunities demand for products which save time-instant food items, micro-ovens, electric cookers, etc., is increasing. Likewise, the demand for entertainment products is also increasing.

(h) **New technologies—** The network of scientific and research laboratories functioning under the Council of Scientific and Industrial Research have developed several new processes and technologies. These offer opportunities for commercial exploitation.

(i) **Emulating consumption patterns from abroad—** There are opportunities for setting up projects in areas that are new in our country, but are quite common in many developed countries. The entrepreneurs prepared to take higher risk can look into similar project opportunities.

(j) **Restoring life to sick units—** There are thousands of units which are regarded as sick. It is possible to restore life to many such units through better management, infusion of further capital, and provision of complementary inputs. Sick units, therefore, provide good investment opportunities. These investments have the additional advantage of short gestation periods and marginal efforts to restore life to the sick undertakings which are on the anvil of closure.

(k) **Analysis of unsatisfied needs of consumers—** For a wide range of existing products of daily consumption, it may be worth while to analyse whether these products are satisfying the psychological needs of consumers. Such an analysis may reveal opportunities for investment. Spectrum analysis is used to find out the opportunities: the analysis consists of :

    a. identifying the key factors influencing the choice of brand products,

    b. positioning the existing brands of the product on a continuum in respect of factors identified earlier, and

    c. Identifying the deficiencies which exist with respect to the psychological needs of consumers.

(l) **International and national trade fairs and industry exhibitions**— provide opportunities to know about new products, new technologies/processes, and new developments.

(m) **Stimulate creativity for generating new product ideas**— By thinking along the following lines-modification, rearrangement, reversal, magnification, reduction, substitution, adaptation, combination-new product ideas may be generated.

(n) **Chance factor**— Sometimes, just a chance factor may trigger an investment opportunity.

Basic Conditions

With a view to make an initial selection of project ideas out of several, the following aspects must be considered:

a. Match with the entrepreneur profile— The project idea must match with the entrepreneur's interest, personality, and resources. The real opportunity, according to Murphy, has three characteristics-

(i) It fits with entrepreneur's personality, it squares with his abilities, training, and proclivities,

(ii) It is accessible to him, and

(iii) It offers him rapid growth and high return on investment.

b. Fit with national priorities— The project idea must fit with national priorities and government's regulatory framework. For this, the following questions have to be addressed

(i) Whether the project idea is in tune with national priorities and goals?

(ii) Whether the project idea violates any environmental regulations?

(iii) Whether the foreign exchange requirements for the project can be accommodated?

(iv) Whether the license, if required, can be obtained?

c. Availability of inputs— With a view to assess the reasonable availability of resources and inputs for the project, the following questions must be answered:

(i) Are project's capital requirements within limits?

(ii) Can the technical know-how for the project be obtained?

(iii) Are raw materials required for the project available at reasonable price indigenously? If not, are there any problems in importing them?

(iv) Can power supply for the project be obtained from external sources and captive sources? There has been chronic shortage in India of certain key inputs like power supply, foreign exchange, and important raw materials: and fluctuating supplies of agricultural raw materials like cotton, jute and oil seed. However, in recent times, the situation has improved with respect to power supply, foreign exchange availability, and supplies of basic industrial materials.

d. Market size — The market size should be sufficient enough to offer satisfactory sales volume to support production. In addition, there should be rapid growth potential and high return on investment. The market size and its adequacy have to be examined with reference to the following factors:-

    i)   Total present domestic market,

    ii)   Competitors and their market shares,

    iii)   Extent of export market,

    iv)   Quality price profile of the product among the competing products,

    v)   The system of sales and distribution,

    vi)   Likely increase in consumption,

    vii)   Barriers to the entry of new units,

    viii)   Economic social and demographic trends favorable to increased consumption, and

    ix)   Patent protection.

Apart from few exceptions, the trend by-and-large, growing demand for many products. This trend will continue because of the low per capita consumption levels in our country. The demand for many products, fortunately, is not at the expense of demand for some other products as in developed western countries.

e. Cost — The cost of the proposed product/service must enable it to realize an acceptable profit with a competitive price. For this, the following factors have to be carefully analysed:

    (i)   costs of input material,

    (ii)   wage costs,

    (iii)   factory overhead expenses,

    (iv)   general administration expenses,

    (v)   selling and distribution expenses,

    (vi)   service charges and

    (vii) economies of scale.

f. Risk — The risk associated with a project is a critical component in determining the desirability or otherwise of the product. Assessing the risk is a very difficult task, and the following factors have to be considered:

    (i)   vulnerability to business cycles,

    (ii)   technological changes,

    (iii)   competition from substitutes,

    (iv)   competition from imports, and

    (v)   Governmental control over price and distribution.

Such an analysis should focus on the following issues:

(a) Internal financial resources available for investment on new project after taking into account the need for replacement.

(b) Expenditures, increase in working capital, repayment of borrowings, and divided obligations, and the extent to which financial resources can be raised externally for the new projects.

(c) Production facilities currently available, technological capabilities existing with the company, in-house research and development, and new technological collaborations that can be tied-up.

(d) Sources or raw materials and their reliability, adequacy of power supply and other utilities, transport and communication facilities.

(e) Present cost structure of existing products and their contribution to profitability.

(f) Market share, distribution network, and the company's image in the market place.

(g) Resourcefulness and competence of top management, age profile of middle and top executives, employee motivation level and the state of employer- employee relations.

(h) Effect of the regulatory legislation on the company and the opportunities available to the company.

(i) Likely changes in governmental policies with respect to industrial licensing, private sector, foreign exchange control, collaboration or tie-up with foreign companies, and import and export policies.

(j) Evolving new technologies and new methods/processes of production, and their likely effect on the cost structure of company's products.

7.3 Project Selection Considerations and Feasibility Studies

This Section includes :

- **Definition**
- **Macro Factors & Micro Factors**
- **Pre-feasibility Study**
  - **Technical Feasibility**
  - **Financial Viability**
  - **Environmental and Economic viability**
- **Project feasibility Report and contents**

INTRODUCTION :

In the economic arena, the most basic choice that all countries must face is allocating resources between current consumption of products and services and investment in future growth. In developing countries like India, the choice has to be made under conditions of deplorably low, often subsistence, level of consumption of a large proportion of the population and the urgent need to invest in the hope of achieving higher living standards. When the choice in the favour of investment for future development, it is absolutely necessary that the scarce resources are deployed to secure maximum benefit. Packaging these investments in to projects, whether in public, private of joint sector, through the disciplined project approach can be a very effective means towards this end.

DEFINITION :

The definition of the term project as per Oxford's Dictionary is as below

- A plan for an undertaking
- A plan for a scheme for an undertaking for an economic activity of recreation of wealth through products and services.

From the definition the following three points emerge:

- A plan- for future
- For an economic activity- which activity would cover everything from inputs- outputs and efficiencies-inefficiencies etc.
- Products and services- manufacturing entities would fall under first category while say travel related services would fall under second category.

From the above definition, one point which arises is that no entity in this world can be independent. Even as an individual, we are a part of a family. The family is a part of the society. The society is a part of a geographical location. The geographical location is a part of nation. The nation is a part of the world. Similarly any entity is not independent. It has to depend on say suppliers for supply of materials, men and machine for processing the same, customers for sale of finished products etc.

To study this interdependence various factors have to be taken into account. The factors to be considered before conceiving a project could be broadly divided into two categories; i.e. macro factors and micro factors.

MACRO FACTORS :

The macro factors would be the guiding points not directly related with the project but the ones that affect any project due to their mere presence or absence. These factors are more at broader level affecting the entire economy or entire region or all the industrial activity in a particular environment or business line. Briefly the more factors could be categorized in the following manner:

Political Factors

These factors would include Govt. policies in general and including the policies framed for a specific industry. The policy framework would need to be considered both at the Central Government level and State Government levels. These would also include the guidelines with special reference to some industrial segments like drugs, telecom, power, infrastructure like ports, roads, airports, etc. There are a lot of stipulations as regards safety, credentials of the management and experience in handling similar project before a permission is granted..

Economic Factors

These factors would include the guidelines and directives for various industrial concerns as well as the regulations for raising of funds towards meeting the cost of project and other incidental requirements. This would also include the demand and supply within the economy and the international position of the products proposed to be manufactured which considers the stand of an economy against the international trade organizations and industries vis-à-vis positioning and trades bar driers and tariff structures. The factors would also include various guidelines of SEBI and those applicable to raising external commercial borrowings, NRI money inflow and loan from international agencies. These are governed by various structures of Reserve Bank of India and ministry of Finance and Exchange Control

Social Factors

Any entity which is implementing a plan in contributing for the welfare of the society must not interfere with laws of the land. This would include various laws which are of social importance and hence, as part of the society every enterprise shall comply with standards applicable to the industries and industrial activity shall not hamper the rights of the society. Besides this, social factors should also hinge upon factors like unemployment, child labour, pollution, labour welfare, consumer protection and fair business practices. These factors would necessitate clearances like MRTP pollution Control clearances and compliance with Acts like Factories Act and other employee related legislations.

MICRO FACTORS :

Micro factors would actually include the considerations which are specific to the industry that have been short listed by an entrepreneur after going through macro factors. Where macro factors facilitate selection of an industry and line of business for an entrepreneur,

micro factors would decide the blue print for the project within the industry and business activity chosen. In the language of a layman, micro factors would strive to find answers to various question as who-what-where how much-how-whom- worth. Answering these questions would assist the decision of an entrepreneur, the choice of product line, location of the project, capacity of the project the choice of the technology selection, the market for the product chosen and the cost of the project and means of financing the project.

Initial Stage

The initial stages in the product identification would be the conception stage itself. The surrounding environment of any would be entrepreneur could be the biggest influence on the thought process. One could consider the now corporate success story of "Good Knight" mosquito repellants. The concept of an electrical device to combat the torture of the insects was result of affection of a father for a daughter being tortured by mosquitoes and the then available products becoming inactive. The reason for making a reference here is that a professional could be of help right from the conception stage of a project. The key lies in recognising and anticipating potential success of a project which an entrepreneur thinks.

Role of a Professional

The value that a professional should be able to add would emerge out of his experience to understand various aspects related to the project. Typically, when any entrepreneur approaches a professional to draw up a business plan for his proposed project, the professional should look at the viability of the project from all angles. He is expected to find out the resources available with the promoters of the project which would form the very basis for evaluating the possibility of a project size that the promoters are contemplating to establish. The professional has to bear in mind that in order to be eligible to obtain funding from any recognized financial institution agency or banks, the prime requirement would be a minimum contribution in the project by the promoters.

The Project Cycle

It is convenient to think of project work as comprising several distinct stages, commonly referred to collectively as the project cycle. The idea of a cycle underscores the point that the stages are closely linked and follow a logical progression, with the later stages providing the basis for a renewal of the cycle. The principal stages of the cycle are the identification of project ; its design preparation and appraisal; its implementations; and its evaluation once the investment phase has been completed.

Project Identification

The project cycle begins with the identification of project ideas that appears to represent a high-priority use of a country's resources to achieve important development objectives. The identification and preliminary screening of project ideas is a critical part of the process. Decisions made at this stage, either explicitly or by default, have a far reaching impact on the final outcome of the project. It is particularly important at the outset to consider as wide a range of alternative approaches as feasible. All too often, project ideas are put, forward and accepted without adequately weighting alternative, and possibly cheaper or more effective,

means of achieving the same objectives. Whether the result of vested interests, political pressure, or simply lack of information about viable options, the consequences are same; opportunities lost at this stage can seldom be recaptured. There is no substitute for ebbing in the first place.

Explicit attention should be given defining a project's a objectives and on the strategy for achieving them. The intended beneficiaries of the project must be consulted when their participation in designing and implementing the project is important to its ultimate success. Failure to reach an understanding about objectives and to secure a firm commitment from all those concerned has often generated friction later and resulted in poor project implementation. A project can be considered to have passed the identification stage when:

(a)   Major options and alternatives have been identified and some initial choice made

(b)   The principal policy issues affecting project outcome have been identified and appear to be amenable to solution.

(c)   The project options selected are likely to be justified, given rough estimates for the expected costs and benefits.

(d)   It appears that the project will have adequate support both from the political authorities and from the intended beneficiaries.

(e)   The prospects are reasonable that adequate funding will be available from local, and if needed, external sources.

(f)   A specific plan for preparation of the project has been established.

Project Preparation

The next stage is project preparation. It involves undertaking a feasibility study for all but the simplest and most routine projects. As the term implies, its purpose is to establish the feasibility or justification of the project, both as a whole and in its principal dimensions-technical, economic, financial, and social. And so on, each dimension must be analysed both separately and in relation to all the others. This is done in a series of approximations that test different technical approaches for their economic benefit and financial viability. The purpose of the analysis is not to determine whether a particular idea is good enough to proceed with but to arrive at the best one possible under the circumstances. Although the feasibility study should be designed with the due regard for cost, this is not the place to skimp; if done well the study is bound to pay for itself many times over through cost savings or increased benefits.

PRE-FEASIBILITY STUDY :

The formulation of techno-economic feasibility study is a costly and time consuming task, although such a study enables a definite decision to be made on the project. So, before assigning funds for detailed feasibility study, a preliminary assessment of the project idea must be in a pre-feasibility study.

This analysis seeks to determine whether the projects are prima facie worth while to justify a feasibility study and what aspects of the project are critical to its viability. This is ascertained by an in-depth investigation. Covering almost the same ground as the preliminary project analysis, a feasibility study is undertaken in a more detailed manner thoroughly and

completely. This study results in a reasonably adequate formulation of the project in terms of location, production capacity, production technology material inputs etc., and contains fairly specific estimates of projects cost, means of financing, sales revenues, production costs, financial profitability and social benefits. This aids decision making. Once this is done, a preliminary project analysis has to be taken up. The preliminary project analysis is a prelude to a full blown feasibility study. It concerns itself with marketing, technical, financial and economic aspects of the project. The principal objectives for preliminary study are to determine whether :

(a) The investment opportunity is so promising that an investment decision can be taken on the basis of the information elaborated at the pre-feasibility stage.

(b) The project concept justifies a detailed analysis by a feasibility study.

(c) Any aspect of the project are critical to its feasibility and requires in depth investigation through functional or support studies such as market surveys laboratory test, pilot plant tests etc.

(d) The information is adequate to decide that the project idea is not either viable proposition or attractive enough for a particular investor or investor group.

A Pre-feasibility study should be viewed as an intermediate stage between a project analysis or feasibility study, the difference being primarily the detail of the information obtained. Accordingly it is necessary even at the pre-feasibility stage to examine broadly the economic alternatives of ;

(a) Market and plant capacity – demand and market study, sales and marketing production programme, and plant capacity.

(b) Material inputs

(c) Location and site

(d) Project engineering – technologies and equipment, and civil engineering works.

(F) Manpower – labour and staff.

(g) Implementation

(h) Financial analysis – investment costs, project financing, production costs, and commercial profitability.

When a project opportunity study is conducted in respect of an investment possibility the pre-feasibility stage can be dispensed. It can also be by passed when a sector to resources opportunity study contains sufficient project data to either processed to the feasibility stage determine its discontinuance. The economics of the project are doubtful unless a certain aspect for the study has been investigated depth by a detailed market study. Or some other functional study, to determine the viable Short-cuts may be used to determine minor components of investment outlay and production cost but not to determine major cost components. The latter must be estimated for the projects as a part of the pre-feasibility study, but it is not necessary to depend quotations.

A feasibility study must provide a base – technical, economic, financial, social etc., for an investment decision on an industrial project. It should define and analyse the critical elements that relate to the production of a given project together with alternative approaches to such production. Such a study should provide a project of a defined production capacity at selected location, using a particular technology or technologies in relation to defined material and inputs, at a given investment and production costs, and sales revenues yielding a defined return on investment.

To achieve this objective, an interactive process is carried out with a cycle of feedbacks and interlink ages covering possible alternative solutions for production programmes, locations, sites technology, plant, mechanical, electrical and civil engineering and organizational structure that have to be harmonized in order to minimize investment and production costs, If the resulting data show the project to be unviable then the various parameters – materials, technology, and production programme should be adjusted with a view to present well defined viable project. The feasibility should describe this optimization process; justify the assumptions made and the solutions chosen.

A feasibility report to be realistic will not be considered complete unless the financing arrangements are defined and considered. These include defining the fund requirements of capital expenditure, initial working capital and pre-operating expense and the source of funds- debt or equity. The phased fund requirements and cash flow requires to be determined and spelt out in the feasibility report. A summation of all the above aspects both technical and financial, besides other non cost/technical aspects, results in the preparation of cost estimates of projects.

A feasibility study broadly covers the following areas:

- Technical feasibility
- Organisation set up
- Managerial competence
- Commercial aspects
- Financial feasibility.

TECHNICAL FEASIBILITY :

All factors relating to infrastructural needs, technology, of machine material etc., are required to be scrutinized under the phase. Broadly speaking, the factors that are covered under this aspects includes

1) Availability of basic infrastructure

2) Licensing /registration requirements

3) Selection of technology/ technical process

4) Availability of suitable machinery/ raw material / skilled labour etc.,

Managerial Competence

The ultimate success of a very well conceived and viable project may depend on how competently it is managed. Besides project implementation other important function required to be controlled can broadly be classified as under

1. Production
2. Finance
3. Marketing
4. Personnel

A complete integration of all these functions within the organisastion may be the first step towards an effective management.

FINANCIAL & COMMERCIAL VIABILITY :

Financial

Various steps are involved to determine the financial viability of a project which are as under:-

1. Determination of project cost
2. Sources of fund/means of financing and proper utilization of fund
3. Profitability analysis
4. Break-even analysis
5. Cash flow/fund flow statement
6. Debt service coverage ratio

Commercial

Any project can be commercially viable only if it is able to sell at a profit and the collection from customers is on time. For this purpose it would be necessary to study demand and supply pattern of that particular product to determine its marketability.

Various methods such as trend method, regression method for estimation of demand are employed which is then to be matched with the available supply of a particular product. The prospects of exporting the product may also be examined while assessing the demand.

ENVIRONMENTAL AND ECONOMIC VIABILITY

The performance of a project may not only be influenced by the financial factors as stated above. Other external environmental factors which may be economic, social or cultural may have a positive impact as well. The larger projects may be critically evaluated by the lending institutions by taking into consideration the following factors-

1) Employment potential
2) Utilization of domestically available raw material and other facilities
3) Development of industrially backward areas as per govt. policy
4) Effect of the project on the environment with particular emphasis on the pollution of water and air to be caused by it.
5) the arrangements for effective disposal of effluent as per Govt. policy
6) Energy conservation devices etc. employed for the project.

Other economic factors which influence the final approval of a particular project are-

1. Internal Rate of Return (IRR)
2. Domestic Resources Cost (DRC)

A schedule of feasibility study is prepared indicting the time content of each activity, like, obtaining industrial license, acquisition of land and utilities, financial arrangement, process licensing and consultancy services, detailed engineering, placement of orders, deliveries, soil surveys, site preparation, civil and structural works, equipment creation, testing and checking and ultimately commissioning of the project. There is bound to be overlapping of the time schedule in this activity. The various approaches for time scheduling are normally banded as CAT (committed activity Targets) and RAT (Reserved Activity Targets) schedules. The CAT schedule is use for progressing of the executing agencies whereas the RAT schedules are those that are to be achieved. It will be the endeavor of the project management to maintain a distance between the two schedules so that "CAT does not eat the RATS"

PROJECT FEASIBILITY REPORT :

A feasibility report is prepared to present an in-depth techno commercial analysis carried out on the project idea for consideration of the financial institutions and other authorities empowered to make the decision, as to whether the investment on the project is to be made or not. The government guidelines on the contents of a feasibility report *inter alia* include:

a) Survey of material requirements
b) Study of demand of product or services (Market Analysis)
c) Study of the configuration of the project idea in all aspects like technical, product pattern, process, plant size and raw material requirements.
d) Study of location- geographical, political, social etc.
e) Project schedule.
f) Project cost and source of finance-estimates.
g) Profitability and cash flow analysis.
h) CBA (Cost Benefit Analysis)/ SCBA.

Survey of material requirements primarily relates to raw material survey. Raw material may be available in the form of deposits, finished products, by products, imports, again imports in the form or raw material, finished parts etc. It is necessary to establish availability of raw material as well as confirmed sources of supply.

Secondly, the identification of the uses of the product or service proposed to be generated by the project, the prospective consumers, data on present and future consumption, export possibilities constitute the demand study. It also covers supply pattern, distribution and rises. A demand study is based on published literatures and special independent survey data.

Detailed Project Report (DPR)

After the feasibility studies are carried out, a detailed project report (DPR) is required to be drawn up based on the data and results obtained from the studies. The preparation of the DPR is the final and most important stage of pre-investment phase of project. It is on the basis of the DPR, the project Investment Board and the cabinet Committee of Economic

Affairs give their clearance for the project.

The preparation of DPR is undertaken only after the investment decision is made on the basis of the technical, economic, and financial feasibility studies, so that the expensive efforts involved in the preparation of DPR are not wasted. Process designs, layout drawings and construction data are absolutely necessary for the preparation of DPR. Generally, completion of the DPR is expected to be completed within a year after the investment decision based on feasibility study. This will enable the early implementation of the project, without rendering the cost estimates to be affected by higher incidence of inflation.

The outline and the content of DPR is the same as the techno-economic feasibility report. All the vital aspects of location and site cost, process/technology, market demand, plant capacity, product revenue, production costs, profitability, economic benefits, etc, must be covered in much greater detail in the DPR. The basic difference between the feasibility study report and DPR is the level of accuracy and the degree of detail. To prepare the DPR from a techno-economic feasibility study report, we have to-

1) Breakdown all project components, time-phase and schedule them with more detailed and accurate cost estimates, deviations from the feasibility study report with explanations, giving the improved basis for assumptions and calculations,

2) Develop base lines for controlling time and cost during the implementation of the project, and

3) Be prepared with all the technical and financial resource required to implement the project.

The items to be covered in DPR are :

a) Deviations from the feasibility study,

b) Drawings.

c) Physical topographical information,

d) Rates and basis of various cost estimates,

e) Water and power supply-guarantee from power boards/local authority.

f) Estimates relating to land, site development, main part structures auxiliary plant structures, administrative and other buildings, roads and paved areas, railway sidings, water supply, effluent disposer, storm water drainage, power supply, construction plant and equipment, compound wall/fencing, plant layout and equipment, machinery, spares, foundation, erection, electrification, material handling equipment etc.

g) General – important duty rates, freight and handling, insurance, and contingencies.

h) Assessment of working capital requirements with due consideration of inventory and credit policies consistent with marketing networking proposed.

Development of ancillary industries is an additional criterion meriting the clearance of DPR for new projects and expansion of existing facilities. The requirements in this regard are:

(a) All DPRs must indicate the parts, components etc., with approximate annual quantities proposed to be procured from ancillary industries around the project, for use in construction operation and maintenance.

(b) When applying for industrial license or letter of intent, where applicable the items proposed to be procured from ancillary industries around the projects must be started.

(c) Before finalising foreign collaboration agreements, consideration should be given to items obtainable from ancillary industries.

7.4 Project Appraisal and Cost Benefit Analysis

This section includes :

- **Project Development Cycle**
- **Market Appraisal and Feasibility**
- **Sources of Data for Market Appraisal**
- **Market Survey**
- **Forecasting the Demand**
- **Financial Appraisal**
- **Economic Appraisal**
- **Social Cost Benefit Analysis**

INTRODUCTION :

A comprehensive feasibility study and appraisal are the basis for the successful completion, implementation and operation of a project. The feasibility study consists of detailed analysis and appraisal of the project from various relevant angles. Many international and national organizations such as United Nation /UNIDO; OECD Development Centre, Asian Development Bank, Industrial Development Bank of India (IDBI), the Central Planning Commission, and the Department of Public Enterprises (DPE) have issued guidelines for conducting the project feasibility studies and appraisal projects.

PROJECT DEVELOPMENT CYCLE :

The various activities in the different phases of a project could be summed up into 3 phases, as per UNIDO classification, i.e.

A. Pre-investment Phase, consists of –

1) Identification of investment opportunity

2) Preliminary project analysis

3) Feasibility study

4) Decision making

B. Implementation Phase, consists of –

1) Project and engineering design

2) Negotiations and contracts

3) Construction

4) Training

5) Plant commissioning.

C. Operational Phase

Which is the longest phase in terms of time span practically covering entire project life cycle. There are two phases, namely,-

Short-Run

1) Smooth and uninterrupted operations of plant and machinery

2) Development of suitable norms of productivity.

3) Establishing good quality of the product.

4) Securing acceptance of product.

Long-Run

Realisation or betterment or projections with regard to sales, production, cost and profit as estimated in the feasibility report.

Pre investment phase starts with identification of investment opportunity and calls for analyzing amongst other things, the following-

- Plan priorities

- Demand and supply projections of goods and services

- Patterns of imports and exports

- Natural resources.

- Expansion facilities

- Consumption pattern.

In the implementation stage, the First is the project and engineering designing which is concerned with activities like site probing and prospecting, preparation of blue prints and plant designs, plant engineering, selection of specific machineries and equipment. Then comes negotiating and contracting which relates to conducting discussions, negotiating and drawing up legal contracts with respect to project financing, acquisition of technology, construction of buildings and civil works, provision for utilities, supply of machinery and equipment, marketing arrangements etc., The third step is site preparation, construction of buildings civil works, creation and installation of machinery and equipment, this is followed by training of personnel which could also be planned simultaneously with the earlier step. The final step, the implementation stage is the plant commissioning which heralds the start up of the plant and is the crucial stage in project development cycle.

The next phase, that is operational phase which covers the entire project life cycle is clearly the longest phase in terms of time span. It begins when the project is wound up. The objective from the operational point of view is on smooth and uninterrupted operation of machinery and plant, development of suitable norms of productivity, establishment of a good quality of the product and securing the market acceptance of the product. This is a short term objective. The long run objective is realization or betterment of sales, production, cost and profit as estimated in the feasibility report.

To determine the viability of a project, number of feasibility studies is conducted with a view to make realistic appraisal of the project. Aspects of appraisal activity involves, broadly four types

- The market appraisal.

- The technical appraisal.

- The financial appraisal.

- The economic appraisal.

These will be examined individually in the following paragraphs to underline the important of the appraisal activity. Before making an investment decision on the project, these appraisal are to be undertaken.

MARKET APPRAISAL :

Market appraisal of a project investment relates to finding out the aggregate demand of the proposed product/service in future as well as the market share of the proposal under consideration. To ascertain the above a wide variety of information is required. These data mainly relate to:

- Consumption trends (past, present).

- Supply position.

- Production possibilities.

- Constraints.

- Cost structure.

- Elasticity of demand.

- Consumer behavior.

- Distribution channels.

- Marketing policies.

    Administrative, technical and legal constraints.

MARKET FEASIBILITY :

The project appraisal exercise, in general, begins with an estimation of the size of the market. Before undertaking a detailed exercise of finding out the technical and financial feasibility of the project, it is important to know the approximate size of the market. This is necessary because the viability of the project depends critically on whether or not the estimated sales satisfy the demand for that product or services. To conduct the market feasibility of a project, we must be clear in the first place what data is required for market analysis and the sources of such data. Many times it also becomes necessary to collect the data from primary sources through market survey. From these primary and secondary sources of data, demand forecasting is made. Each of these will be discussed in this section.

Data Required for Market Analysis

The relevant data for market analysis consists of -

i. Effective demand in the previous years and at present,

ii. Classification by product type, consumer category, or geographical area,

iii. Price,

iv. The distribution and sales promotion methods

v. Consumer profile,

vi. Government policy,

vii. Current sources of supply and competitors.

In the determining the previous and present effective demand, the production levels imports, exports, and changes in stock levels are taken into account. The apparent consumption is adjusted for productions and the effect of abnormal factors if any. In a free market economy, the effective demand is the same as apparent consumption. In countries where competitive markets do not exist for a variety of products due to exchange restrictions and controls on production and distribution, the apparent consumption has to be adjusted for market imperfections which are not an easy task.

In order to understand the total market or demand for the product, it is divided into several segments by product type consumer category, and geographic area. A generic consumer profile data is of two types—demographic and sociological information, and attitudinal information. Demographic and sociological data includes age, sex, income, occupation, social back ground, religion, etc. Data pertaining to attitudes include preferences, likes and dislikes habits, responses, etc.

Government can influence the demand for a product through its policies, plans, legislation etc. These are reflected in production capacities, import and export trade controls, import and customs duties, export incentives, excise duties, sales tax, industrial licensing, credit controls, financial regulations, etc.

SOURCES OF DATA FOR MARKET ANALYSIS :

The various types of data required can be obtained from two sources-primary and secondary. The primary data is collected by conducting market survey: it refers to the data which is collected for the first time to meet the specific purpose on hand. Secondary data is data which has been collected in some other context. Secondary data provides the base and the starting point for market analysis. It indicates what is already known and offers clues and leads for further investigation. The important sources of secondary information are:

(i) Census data published every ten years containing demographic characteristic, household size and composition.

(ii) National Sample Survey reports containing data on various economic and social aspects.

(iii) Planning Commission reports containing data on plan, proposals physical and financial targets, actual outlays, accomplishments etc.

(iv) Statistical Abstracts published by Central Statistical Organisation which contain data on demographic characteristics, national income estimates, agricultural and industrial statistics.

(v) India Year Book containing wide ranging data on economic and other aspects.

(vi) UN Statistical Year Book giving statistical data relating to population, gross domestic production, industrial production, world trade etc.

(vii) Annual Economic Survey data on wholesale prices, industrial production, exports, agricultural production, national income etc.

(viii) Central Statistical Organisation's Annual Survey of Industries.

(ix) Annual reports published by Commerce and Trade dept. of Indian Government.

(x) Exports and Imports Annual Bulletin of Statistics.

(xi) Techno economic surveys conducted and published by the National Council of Applied Economic Research.

(xii) Industrial Potential Surveys conducted by all India Financial Institutions under the leadership of IDBI giving data on several backward areas.

(xiii) Stock Exchange Directory containing data on financial performance of various companies classified industry wise.

(xiv) Monthly Bulletin of Reserve Bank of India containing data on prices, production indices, exchange rates, balance of payment, etc.

(xv) Monthly studies of production of selected industries published by Central Statistical Organisation containing data on production, number of units installed, their capacities etc. for selected industries.

(xvi) Publications of Advertising Agencies containing data on consumer index of market, test markets etc. which is valuable for understanding Indian markets.

There are several other publications; those of State Trading Corporation of India, Indian Institute of Foreign Trade etc. provide useful information. Apart from these, there are industry specific data which are also available. For example, Indian Automobile Manufacturers Association publishes annual reports on automobile manufacturers and also on auto ancillary data on such industries as metallurgical industry, heavy machinery industry, textile industry, cement industry, chemicals, and electrical industry, and so on.

The advantage of secondary sources of data is that it is readily and economically available. But the accuracy, reliability and relevance of such data must be studied carefully.

The objectives with which the data is collected

● The age of the data and its relevance now

● Representative character of the data

● Whether it is free from ambiguity

- Target population

- Manner of choosing the sample

- Data collection method

- Sampling bias and non response biases in the data gathered

- Degree of misrepresentation in data

- Data validation and analysis procedures

- Proper application of statistical analysis methods.

MARKET SURVEY :

Secondary data has to be supplemented by primary data for a comprehensive market and demand analysis. The primary data is collected through market survey, specific for the project being appraised. There are two types or market survey-census survey and sample survey. Census survey covers all the members of the population and it is very expensive. Census surveys are generally done for intermediate goods and investment goods because of the small size of the population. For these reasons, a market survey generally is a sample survey. A sample of the total population is selected and data collected for that sample. The data collected from the sample is used as the basis for drawing conclusions about the population. The data collected from a market survey includes one or more of the following:

(i)   Total demand and demand growth rate.

(ii)   Market segment wise demand

(iii)   Income and price elasticities of demand

(iv)   Motivation for purchase

(v)   Procurement plans

(vi)   Satisfaction with existing products

(vii)   Unsatisfied demand

(viii)   Attitude towards various products

(ix)   Distributive trade practices and preferences

(x)   Socio-economic characteristics of buyers

There are several steps in conducting a market survey. The first step is to identify the target population. The target population may be divided into segments which may have different characteristics. The second step is the choice of sample size and the sampling methods. Sampling method is several: random sampling, stratified sampling, cluster sampling, sequential sampling, systematic sampling, and non-probability sampling. Each of these sampling methods has their own merits and demerits. Since the reliability of estimates is a function of sample size, the choice of sample size is important.

The next step is the preparation of questionnaire. Since it is the effective instrument for electing data, the design of the questionnaire requires thorough understanding of product and its usage, imagination, insights into human behavior, appreciation of subtle linguistic noises and familiarity with descriptive and inferential statistical analysis. The questionnaires, validated by trying initially with few respondents, collect pilot survey and modified in the light of experiences gained in the pilot survey.

After validating the survey questionnaire, investigators are recruited and trained for conducting the survey. It is important that these investigators selected have the proper background knowledge about the product. Response to questionnaire may be collected through personal interview, telephone, or by mail. Response rate tends to be high with personal interviews, but it is very time consuming. Sometimes, the response may also be biased. Mail surveys are cost effective, but response rate is generally low. Telephone interviews have not been widely used in view of telephone services in the country.

Data collected through questionnaires has to be validated to eliminate data which is inconsistent and validity dubious. The final steps to analyze and interpret the validated data, several methods of statistical analysis are available: these are broadly divided into parametric and non-parametric methods. Parametric methods assume that the variable under study conform to known distribution. No such known distribution is assumed under non parametric methods. The data analysis based on sample survey has to be extrapolated for the target population. Suitable adjustments have to be made for this purpose.

The results of market survey can be seriously affected due to one or more of the following factors :

i)   the sample being non representative

ii)   improper phrasing of the questions in the questionnaire

iii) respondent's inability to understand questions

iv)   incorrect answers given by respondents deliberately

v)   investigator's improper handling of the interviews

vi)   not checking data for inconsistencies and biases,

vii) Wrong application of statistical method and/or the wrong interpretation of analysis of results.

FORECASTING THE DEMAND :

After collecting data about the various aspects of the market from primary and secondary sources then an attempt to forecast the demand is made. The important techniques for forecasting demand are discussed in the following paragraphs:

Trend Projection Method

The method simply consists of making future demand projections by extrapolating the trend based on the consumption trends in the previous years. The Trend consumption can be denoted by one of the following relationships.

Linear relationship	Yt	=	a + bt

Exponential relationship $\quad = \quad ae^{bt}$

(Or) log Yt $\quad = \quad$ log (a + bt)

Polynomial relationship $\qquad$ Yt $\quad = \quad a^0b + a^1t + a^2t^2 + \ldots a^nt^n$

Cobb Douglas relationship $\qquad$ Yt $\quad = \quad$ at

Or log Yt $\quad = \quad$ log a + b log t

In the above relationships $\qquad$ Yt $\quad = \quad$ demand for the year t

a and b are constants.

The most frequently used relationship is the linear relationship: Y=a + bt

Consumption Level Method

This method makes demand forecasting on the basis of elasticity coefficients, the income elasticity of demand and the price elasticity of demand. The income elasticity of demand refers to changes in demand to changes in income. It is measured by using the formula:

$$E_1 = \frac{Q_2 - Q_1}{I_2 - I_1} \times \frac{I_2 + I_1}{Q_1 + Q_2}$$

Where, $\quad$ Ex = Income elasticity of demand

$\qquad Q_1 \quad$ = Quantity demanded in base year

$\qquad Q_2$ = Quantity demanded in the following year

$\qquad I_1 \quad$ = $\quad$ Income level in the base year

$\qquad I_2 \quad$ = $\quad$ Income level in the following year

Suppose, $Q_1 = 75$, $\quad Q_2 = 82$, $I_1 = 1200$, $I_2 = 1250$

Then $E_1 = \dfrac{82 - 75}{1250 - 1200} \times \dfrac{1200 + 1250}{75 + 82} = 2.185$

The information on income elasticity of demand along with projected income may be used to obtain a demand forecast.

Technical Appraisal

This is a continuous process in the project evaluation system, especially at the project formulation stage. This appraisal determines the pre-requisites for the successful commissioning of the project and the choice of location, size and process. The technical appraisal covers aspects regarding:

- Preliminary tests and studies
- Availability of inputs
- Optimal selection of scale of operations
- Production process
- Equipments and machinery
- Pollution controls
- Factory layout
- Work schedules
- Social aspects of technology etc.

FINANCIAL APPRAISAL :

Financial appraisal of a project is perhaps the most important exercise undertaken by the authorities concerned. The financial viability of the project i.e., whether the return on capital employed and burden of servicing debts would be satisfactory must be ascertained before taking a decision of investment on the project. The information required for financial appraisal are total investment required and the sources of finance for the project. The total investment cost includes the cost of fixed assets (land, building, plant and machinery and others) preliminary expenses, preproduction expenditures and margin for working capital. The financial appraisal of a project involves the following-

- Profitability measurement including aspects like cost of project, cost of capital, profitability projection.
- Financial analysis including cash flows, means of financing.
- Financial evolution: discounting and non-discounting methods.

The discounting methods of financial evolution are:

- Net Present Value (NPV)
- Internal Rate of Return (IRR)
- Benefit Cost Ratio (BCR)

The non-discounting methods of financial evolution are:

- Accounting rate of return (ARR)
- Payback period
- Debt Service Coverage Ratio (DSCR)
- Financial evolution under conditions of uncertainty.

Net Present Value (NPV)

NPV is based on the concept that the Rupee value today is more than Rupee value of tomorrow. It is calculated as the sum of present value of cash inflows – present value of cash outflows. If the net present value is positive then the project is accepted otherwise the project is rejected.

Internal Rate of Return (IRR)

Internal Rate is the rate of return where NPV = 0. It means, it is the point where present value of inflows = present values of outflows.

Benefit Cost Ratio (BCR)

Benefit-Cost Ratio is another criterion used for evaluating projects. There are two definitions. The first definition relates the present value of benefits to the initial investment.

$$BCR = (PVB/I)$$

Where, BCR = Benefit-Cost Ratio

   PVB = Present Value of benefits

   I = Initial investment

The second definition. A net measure relates net present value to initial investment.

$$NBCR = \left(\frac{NPV}{I}\right) = \left(\frac{PVB - I}{I}\right) = \left(\frac{PVB}{I} - \frac{I}{I}\right) = \left(\frac{PVB}{I} - 1\right) = (BCR - 1)$$

Where, NBCR = Net Benefit-Cost Ratio

   NPV = Net Present Value

   PVB = Present value of benefits

   I   = Initial investment

Cost of Capital is taken as 12 %

Year	Cash flow	Present value of benefits at 12%
0	-1000	—
1	180	160.74
2	210	167.37
3	220	156.64
4	240	152.64
5	260	147.42
6	275	139.42
7	270	122.04
8	265	107.06
		1153.33

$$BCR = \frac{Cash\ Inflows}{Investment} = \frac{1153.33}{1000} = 1.153$$

NBCR = BCR – 1 = 1.153 – 1 = 0.153

Accounting Rate of Return (ARR)

The simple rate of return method relies on the operational accounts. It is the ratio of profit in a normal year of full production to the original investment outlay (fixed assets, preproduction capital expenditure and net working capital) this ratio can be computed either for the total

investment outlay or for the equity capital, depending on whether the real profitability of the total investment outlay is to be assessed, or that of the invested equity capital after paying taxes on profits and interests on borrowed capital. The calculated figure of the Accounting Rate of Return (ARR) really depends on how the terms "profits" and "capital" are defined. Capital is defined in two ways:

a) as permanent capital (equity capital, or equity plus reserves, or equity plus reserve plus long term loans):

b) as total investment cost (fixed capital, or equity plus assets plus pre-production capital costs plus working capital)

The measure of ARR normally used in practice are: -

(a) Average income after tax/Initial investment

(b) Average income after-tax/ Average investment

(c) Average income after tax but before interest / Initial investment

(d) Average income after tax but before interest / Average investment

(e) Average income before interest and taxes / Initial investment

(f) Average income before interest and taxes/ Average investment

(g) Total income after tax but before depreciation / Initial investment

Avg. Investment = Half of initial investment x project life in years.

Pay Back Period

It defines or gives number of years required to recover the investment = $\dfrac{\text{Investment}}{\text{Cash inflows}}$

Debt Service Coverage Ratio

Financial Institutions use the DSCR. It determines the debt repayment capacity of firm. Financial Institutions use this to evaluate debt payment capacity of the firms.

$$DSCR = \dfrac{\text{Profit after tax} + \text{Depreciation} + \text{Interest on long term loan}}{\text{Interest of long term loan} + \text{loan repayment instalment}}$$

ECONOMIC APPRAISAL :

Economic appraisal is a methodology for evaluating investment projects from the social point of view. Primarily this methodology is applied to public investments for analyzing social cost and benefits. The direct economic benefits and cost of the project measured in terms of efficiency, impact of project on distribution of income in the society and level of savings and investment in society and lastly the contribution of the project towards fulfillment of certain merit-wants like self sufficiency, employment, social orders etc. are some of the aspects covered in economic appraisal.

Following important points of economic appraisal are to be considered:

- Priority list
- Sustainable demand
- Balance of payment
- Employment opportunities
- Minimum economic size

SOCIAL COST BENEFIT ANALYSIS (SCBA) :

The economic analysis in project appraisal for evaluating investment projects is an important consideration in the analysis of social cost benefit.

Thus SCBA also referred to as economic society benefit analysis, is a part of the economic analysis in project appraisal. SCBA is also relevant in major investments which required Governmental approval since these investments are bearing on national consideration.

The basic difference between commercial calculation and SCBA computations in project appraisal lies in the following :

Commercial Calculation	SCBA
1. Structured objective of higher profitability	Effect on society, health of society, rest on use product etc.
2. Private interest is kept in mind	Wider view on national interest is considered
3. Singular objective	Divergent objectives not conflicting with each other.
4. Return on investment (Maximisation)	Rate of return to be compared with social economy, apportionment of benefits and costs to different time periods, even generation differences are analyzed.
5. Objectives is, "at any cost" achievement	Systematizing complex problems of project planning from point of view of society and nation.

Managerial Competence

The assessment of Managerial capabilities is crucial aspect of the appraisal process as the success of the project depends upon the managerial capabilities of promoters or the senior management. In doing the managerial feasibilities study normally institutions consider the following points;

- Are the promoters of the project entrepreneurs only or managers as well?
- Which are the areas in which they have got expertise?
- Whether they have experience in the related fields?
- What has been the nature of their past managerial experience?
- Have they been successful in developing a professional team of their organizations?
- Whether proper delegation has been implemented in the organization?
- What type of management style they have been adopting?

7.5 Sources of Project Finance and Foreign Collaboration

This Section includes :

- **Sources of Project Finance**
  - **Long Term Funds**
  - **Short Term Funds**
  - **Foreign Currency Funds**
- **Foreign Collaborations**

INTRODUCTION :

Project finance is a subject developed several years ago and the term has acquired several different, and sometimes rather specialized, meanings. In this study note, the term project finance is used in a broad sense meaning the arrangement of sufficient funds to finance the development and construction of a specific major project.

The ways and means of financing a project depends upon the type of development and vary from project to project. In some projects the sponsors will undertake full responsibility for arranging the financial package, leaving the contractor to produce the technical response to the tender incitation. In others, the sponsor will require the contractor to produce a technical proposal supported by a full financing proposal. Whatever approach is taken, there is a wide variety of available financing options. These include capital issues, commercial borrowing, export credits, bilateral and multilateral aid.

- The different ways and means of financing projects
- The Sources of finance
- Role of national and state level financial institution in financing project.
- Tax considerations and incentives in project finance.

Project Financing Situations

For a very long time projects sponsors in developed countries are well experienced in utilizing funds raised by taxation, the subscription of equity by private investors, the issue of capital bonds and the arrangements of loans against acceptable security. The enormous increase in development costs in recent years has placed many projects, even in developed nations, outside the scope of the traditional methods and project sponsors and contractors increasingly are required to design alternate financing schemes. Financial assistance is available from governments as part of their internal programmes of economic development and these are a useful source of project funds. Many projects which are at one time considered the responsibility of public sector are now considered for privatization. While this is a new trend in the recent years, we should not assume that privatization will relieve the public sector of all its financial responsibilities towards a project. Many of the projects suggested for privatization are for public benefit and as such it is inevitable that they will continue to have

environment, social and infrastructural implications which will remain the concern of governments and for which government will remain at least partially financially responsible.

Most major projects in developing countries are in the public sector. If finance is required for these projects, the sponsor will usually be the government and the project will probably be part of a larger scheme contained within a national economic or development plan. Not many projects of this kind can be assessed in conventional balance sheet terms and it will be similar agencies to determine whether a project is viable within the context of the national plan as a whole. The lending institution will often have to content itself with an examination of the social and political situation in the country and the ability of the economy to generate sufficient foreign earnings to repay the loan. If it is satisfied with all the factors, the lending institution may be prepared to lend against the guarantee of the government .This is no to suggest that project financing in the developing countries like India, fits neatly within specific categories. Some projects may be part self-financing and part government sponsored, while some others may involve the participation of major corporations in partnership with a government agency like the State Industrial Development Corporation. Further, the project may seek funds from a wide variety of sources including financial institutions, export credit agencies, development agencies, bilateral aid, or a combination of these. Such considerations make it necessary to examine all the available methods of funding so that the sponsor can obtain the best mix of financing facilities. Both sponsors and contractors may wish to call upon an experienced financial institution, to assess the various financing alternatives and suggest the most desirable one.

Many projects for the development and processing of natural resources – agricultural, mineral, etc. are undertaken by major corporations whose financial position is generally sufficient to enable then to undertake the projects, backed by the strength of their own balance sheets. But, the cost of some projects is now so large that even large business houses are becoming increasingly unwilling to make disproportionate financial commitments towards one particular project and are seeking ways to raise the necessary finances, either within the country or in international financial markets. (Ex issue of Euro-bonds in recent times) In order to meet this requirement, the technique of "Limited resource financing" has been developed so that the financial commitment and the risks associated with a project are shared between the project sponsor and the lending institutions; the lender's recourse for repayment is limited primarily to revenues form the project itself.

SOURCES OF PROJECT FINANCE :

There are no common sources of project finance applicable to all projects – projects in the public, joint, and private sectors. Some of the project finance sources are exclusively for the public sector projects while some others are exclusively for the private sector projects. Private sector projects are mostly taken up with capital raised in the share market. Until recently, public sector companies are not listed on stock exchange; a few public sector undertakings are now listed on stock exchanges. Availability of funds of a certain class is also linked with the undertaking's industry and size. For instance, the eligibility criteria for raising funds through the Commercial Paper include a minimum tangible net worth of one crore rupees, a fund based working capital limit of twenty five crore rupees and listing on one or more stock exchanges among several others.

The major sources of finance can be broadly classified into:

(a) Long – term rupee funds.

(b) Short term rupee funds.

(c) Foreign currency funds.

LONG – TERM FUNDS :

The long term funds are raised through:

i) Equity and Preference Share Capital including promoters group's contribution, seed capital assistance, risk capital foundation scheme etc.

ii) Debentures, convertible and non-convertible.

iii) Long term loans, like rupee-term loans, foreign currency term loans. Euro-issues deferred credit.

iv) Public sector bonds (unsecured loans and deposits).

v) Lease financing (lease and hire purchase).

vi) Internal generation of funds, (retained profit, depreciation).

vii) Central Government Budgetary Support like subsidies, sales tax deferment and exemption.

viii) Bill rediscounting schemes, suppliers line of credit.

Equity and Preference Share Capital

Equity Capital represents permanent capital and there is no liability for repayment. There is also no obligation to pay dividends on equity capital. The cost of equity capital in high because dividends are not tax deductible expenses. The cost of issuing equity capital is also high.

SEBI has issued guidelines for the issue of equity shares for public subscription. The amount of equity capital issued for public subscription is decided after working out the debt-equity ratio and the promoters' contribution. Generally, debt-equity ratio, promoters' contribution, and the amount of equity issued for public subscription are decided collectively by the consortium of banks, financial institutions, the financial consultant, the merchant bank and the finance manager cum secretary of the firm. Once the pattern of financing the project and the amount of public issue are determined, the responsibility for managing the issue is assigned to a merchant banker.

It is important to maintain balance between own funds (equity) and borrowed funds (debt). After estimating the total funds required for the project, the amount to be raised as equity share capital and the amount to be borrowed must be determined. In this context, it must be remembered that the cost of borrowed capital is cheaper than the cost of equity capital. This is because dividends on equity share capital are paid form profit after tax, while interest on borrowed funds is paid from profit before tax, treating it as any other item of normal expenditure.

The usual practice is to meet the initial capital investment including the margin for working capital be equity share capital and long term borrowings of various types. The working capital requirements are made from short-term and medium term borrowings. For the purpose of determining ratio, equity, as defined by the financial institutions consists of:

  i) Paid-up ordinary share capital

  ii) Irredeemable preference shares

  iii) Preference shares redeemable after three years.

  iv) Net free reserves and trained profits

  v) Share premium

  vi) Interest free unsecured loans of long term nature

  vii) Non-refundable deposits, if any; and

  viii) Capital subsidy/cash subsidy from Central / State Governments

The debt, also defined by the financial institutions, consists of :

  a) Term loans and deposits repayable after 12 months

  b) Deferred credits

  c) Preference shares redeemable within 3 years

  d) Convertible debentures till their conversion

  e) Non –convertible debentures

  f) Unsecured loans.

Long Term Loans

The largest single source of project financing is the long term institutional assistance. There are several national and international financing institutions which either lend their own funds directly or act as agents for channel sing funds flowing from government, bigger lending institutions or foreign governments.

The main development banks and development institutions are the Industrial Development Bank of India (IDBI), the Industrial Finance Corporation of India (IFCI), Industrial Credit and Investment Corporation of India (ICICI), Industrial Reconstruction Bank of India (IRBI), Power Finance Corporation (PFC), National Housing Bank (NKB), and Small Industries Development Bank of India (SIDBI),. The investment institutions are the Life Insurance Corporation of India (LIC), Unit trust of India, (UTI) and General Insurance Corporations (GIC), Besides these major institutions, there are mutual funds promoted by some of these institutions and the commercial banks. There are about fifty development financing institutions and all these participate in equity investment and also give term-loans. The sources of funds for these institutions are deposits, borrowings and income form investments. Further, they also borrow from government and Reserve Bank of India.

The IDBI, as the apex development bank, coordinates the activities of all development financing institutions (DFI). As the coordinating agency, IDBI caters to the project financing requirements of all viable industrial projects either directly or through DFIs. The DFI assistance is at two levels. In the first level, they assist project costing up to Rs. 5 crores through State Financial and State Industrial Development Corporation. In the second level, projects costing more than Rs. 5 crores are assisted directly by any one of the DFIs, or in consortium with other Disinvestment institutions or commercial banks. The consortium approach is adopted when the requirements are more than Rs. 20 crores. The DFIs give financial assistance only to industrial projects which are

   (i) employment and export oriented;

  (ii) intended for import substitution,

 (iii) established in backward areas,

 (iv) promoted by new entrepreneurs,

  (v) using locally developed technology, and

 (vi) Aimed at energy saving and pollution control.

The assistance provided by DFIs is of two types :

  (i) term loans in both rupee and foreign currency;

 (ii) Financial guarantees in rupees and foreign currency for deferred credits and loans rose from those sources.

The basic lending rate varies between 18 and 20 percent for direct financial assistance. Foreign currency loans out of Euro-currency borrowings carry interest at two percent over London Inter bank Offer Rate (LIBOR). Loans out of other foreign lines of credit usually carry fixed rate of interest, depending on the source of borrowing. The period for repayment and moratorium are fixed on the basis of gestation period extends from 8 to 10 years including moratorium of one to two years.

The financial assistance provided by DFIs are fully secured by way of equitable mortgage, hypothecation of fixed assets and movable property acquired with the loan funds. DFIs may require the personal guarantees of entrepreneurs if the financial position is weak. DFIs expect promoters to contribute 15 to 25 per cent out of the 40 percent equity component in the project cost as their own contribution. In order to discourage project cost overrun, the DFIs insist that the entire amount of overrun should b e financed by promoters, additional contributions. This requirement generally delays the project completion as finding additional funds from their own sources is difficult. The DFIs through their nominees on the Boards, without interfering with day-today management, keep themselves acquainted with the affairs financial performance, inter corporate investments, share transactions award of contracts, and major items of management expenses, payments due to institutions, statutory and other items due to government of the enterprise. The general conditions applicable for financial assistance under this scheme relate to the composition of the Board of Directors, managerial setup, Government sanctions and approvals, sale or purchase of assets, payment of dividends etc.

After receiving applications seeking project financial assistance, the DFIs follow the standard procedure before sanctioning assistance. The initial prima-facie clearance is followed by detailed appraisal and formal sanction. When a consortium approach is adopted, the lead institution along other DFIs will be carrying out the appraisal jointly. On the a basis of the appraisal, the institution and other DFIs. Will be sanctioning their share of assistance. The DFIs have streamlined the procedures for consortium assistance through a single window clearance for all pre –sanction and post sanction matters. After the lead institution is designated IDBI, IFCI, or INICI entrepreneurs are required to deal only with that institution for all matters concerning sanction, disbursement and repayment of dues. Under project finance scheme, the entire loan assistance can be sanctioned and disbursed by the lead institution, which can claim reimbursement from other institutions later to the extent of their respective participation and share in the risk.

There are two schemes for granting bridging by DFIs. One is against term – loan and the other is against underwriting of share issue. In order to implement the project as per schedule, the DFI makes a partial disbursement against term – loan sanctioned by it, pending completion of all other formalities. Such a disbursement generally does not exceed 75 per cent of the sanctioned loan against hypothecation of moveable assets and personal guarantees of promoters/ directors. This is usually in the nature of a demand loan. If the DFIs are satisfied with the reasons for a delay in making the public issue, bridge financier may be provided against underwriting commitments.

DFIs are authorized to deal in foreign exchange and can establish letter of credit for import of capital goods for the projects which have been granted loans in rupee or foreign currency. The loan granted by DFIs is disbursed, after the loan agreement is signed and the progress of work relating to procurement and construction is assessed and certified.

Power Finance Corporation (PFC), National Housing Bank (NHB) and Industrial Reconstruction Bank of India (IRBI) are DFIs intended to serve specific areas. PFC is for the purpose of raising funds to finance power projects. Similarly, NHB is for giving financial assistance to house building projects., The Small Industries Development Bank of India (SIDBI), a subsidiary of IDBI, provides financial assistance to small scale industries. IRBI gives concessional assistance to sick undertakings after the revival proposals are cleared by the Board of Industrial and Financial Reconstruction (BIFR); another agency which renders short term financial assistance for restructuring sick undertaking is the National Renewal Found (NRF).

Financial assistance on long term basis is also available to projects for replacement /renovation and /or adding balancing facilities for improving productivity, enhancing the quality, conserving energy, and overall efficiency. Equipment required for modernization, replacement and balancing facilities are available under the deferred payment scheme of ICICI which is operated through commercial banks. The equipment manufacturer extends deferred credit to the actual users of equipments up to certain amount fixed by ICICI. The equipment manufacturer is paid by ICICI through his bank as soon as the equipment is supplied. The entrepreneur pays through his bank to the ICICI in installments with interest as per agreement.

The Investment Corporations —LIC, UTI, and GIC- invest their funds in the equity of good projects following the investment policies laid down by the Boards of these corporations. Private sector companies as well as public sector enterprises under the same administrative ministry transfer funds from the one enterprise to another in order to help the one which is in need of financial assistance. These are called inter corporate loans. In the case of public sector enterprises, Government has to give its approval for such transfer.

Public Sector Bonds

Public sector enterprises are allowed to issue bonds in order to raise funds for –

   i) establishing new projects,

   ii) expansion or diversification of existing projects.

   iii) modernization facilities, and

   iv) meeting working capital requirements.

The bonds issued by public sector enterprises are similar to debentures. These bonds are of two types – taxable bonds and tax free bonds. The amount of issue of bonds for project financing and other purpose has to be approved by the Finance Ministry. The rates of interest for both taxable and tax free bonds should be within the limit fixed by the government. Interest is paid half-yearly in the form of post dated interest coupons or cheques which are attached with the bond and sent to the subscribers. The investor therefore gets the interest promptly on the due date.

The public sector undertaking can buy back these bonds after a lock in period of 3 years from the date of allotment. The bonds can be placed with the investment institutions, and listed on stock exchanges. These bonds can be transferred by endorsement and delivery.

Lease Financing

A number of non-banking financial companies and even some banks are engaged in the business of lease financing. The leasing companies pay the full price of all required equipment and then lease them out to the lessee under a lease agreement providing for repayment of principal and interest in quarterly or monthly installments. At the end of the lease period, the ownership of the equipment is transferred to the lessee at a nominal residual value. The rate of interest charged for lease financing is higher than lending rate. The repayment capacity of the lessee is the main factor of credit worthiness.

Lease financing has several advantages. The lessee need not invest the capital in full as one time single investment. Generally, the processing time for sanctioning lease finance is fast. When the equipment is no longer needed, the lessee can terminate the agreement and ask lessor to take away the equipment. The lease installment is allowed as deductible expense for tax purpose.

Lease financing has also certain drawbacks. First the interest payment is high. Second, the leased assets do not contribute to the net worth. Third, depreciation allowance cannot be claimed during the period of lease agreement i.e. until the equipment is legally transferred in

the name of lessee. Four in case of termination of lease agreement before its expiry, the installments paid towards principal are not fully refunded, because the lessor will charge penal interest for pre-closing the account and since he may not readily find another lessee to take over and use the equipment. And lastly, the lessee has no freedom to move the leased equipment from one place to another.

Internally Generated Funds

Provision for depreciation which is not a cash expenditure and the profits reserved or retained after payment of dividends are the main sources of internally generated funds. These are available only to an existing enterprise but not a new one.

Budgetary Support from Government

The initial capital investment to the central public sector undertaking is usually in the form of budgetary support from government. This is given partly in the form of equity and partly as a loan. The undertaking pays interest on the loan component, and dividend on the equity component. The loan has to be repaid to the government within a period of fifteen years including a period of moratorium which covers the period of construction and stabilization. Interest for this period is capitalized and added to the loan. The foreign exchange component of budgetary support is given from bilateral and / or multilateral aid available in foreign currency and free foreign exchange reserves.

SHORT TERM FUNDS :

Short term funds are usually required for working capital; to operate the project after it is completed. The working capital consists of the margin to be provided by the entrepreneur and the bulk of the balance is borrowed from a commercial bank or some other source as short term finance. The margin to be provided by the entrepreneur is included in the project cost estimates and is in financed from the various means of financing discussed earlier. The main sources of working capital are :-

(i) Commercial banks,

(ii) The type of debentures issued for meeting working capital requirements are usually the non-convertible debentures.

Commercial Banks

Commercial banks are a major source of short-term finance for business enterprises. Commercial banks, lending norms for working capital are based on the recommendations of the Tandon Committee. The committee has suggested two alternate methods. Under the first method, the working capital to be financed by banks is 75per cent of the gap between total current assets and current liabilities; the remaining 25% called margin is included under project cost financed by long term funds. In the second method the gap is determined by subtracting current liabilities from 75% of total current assets. In the subsequent period, a committee appointed by the Reserve Bank of India endorsed the second method.

The working capital requirement is very large in the case of very large projects. In such cases, several commercial banks may form a consortium and provide working capital finance to

the large enterprises. The large amount of working capital, approximately Rs.640 crores to Reliance Industries is provided by a consortium of nationalized banks with Syndicate bank as the lead bank.

Where raw materials and component are imported, the foreign exchange requirement has to be met from short term working capital. For such imports Payment in rupees is made immediately against release of foreign currency.

The enterprise seeking to avail working capital facility, both in cash and in terms guarantees or letters of credit has to submit an application in the prescribed form accompanied by financial statement (current as well as future projections). After the sanction is obtained inventories and receivables are hypothecated to the bank and the charge in favour of the bank is filed with the Registrar of Companies Even if a large amount is sanctioned, money can be drawn only according to the 'drawing power' determined by accumulated current assets.

A study of the working capital needs met by commercial banks shown that approximately 30 per cent of the requirements only are met by banks; another 30 percent is met from non-convertible debentures and the remaining 35 to 40 per cent is financed from long term sources comprising owners' funds, fixed deposits, and contributions from financial institutions.

Public Deposit

Public deposit is deposits accepted from public by—-

a. public and private non banking non-financial companies,

b. public and private limited non-banking financial companies,

c. government companies since 1980

d. branches of foreign companies,

e. partnership firms, and

f. Proprietary concerns.

The no financial type organizations account for the largest proportion of total public deposits.

The public deposits with companies are divided into two categories, (a) deposits and (b) exempted borrowings. The deposits are-

(i)   loans guaranteed by the former managing agent or secretaries and treasures,

(ii) unsecured debentures,

(iii) deposits and unsecured loans from shareholders,

(iv) deposits and unsecured members in the case of mutual benefit financial companies

(v)   fixed deposits,

(vi) deposits from associate members in the case of mutual benefit companies, and

(vii) Other deposits.

The exempted borrowings are:

i)   borrowings from former managing agents and secretaries and treasurers

ii) money from shareholders in the case of private companies,

iii) security deposits from employees,

iv) money received from selling and purchasing

v)   money received from joint stock companies of the same group or others, and

vi) security deposits companies of the same group or others, and

vii) other borrowings (loans from government and security deposits from customers).

viii) Money received from Directors,

Commercial Paper

Commercial paper, as a source of short –term financing of working capital needs, is a recent phenomenon. The commercial paper was introduced by RBI in early 1990 with a view to enable highly rated corporate borrowers to diversify their sources of short term borrowing. Commercial paper, as defined by Jame C.Van Horne in his book Financial Management and Policy, is a short term unsecured promissory note issued by finance companies and certain industrial concerns. While the commercial paper as financial instruments is prevalent in both USA and Europe, its entry in India is recent. The Vaghul Committee set up by RBI in 1986, recommended the introduction of commercial paper with the objective of providing reasonable access to users of short term money to meet their requirements at a realistic price. In the opinion of the Committee, the commercial paper market has the advantage of giving highly rated corporate borrowers cheaper funds than they could obtain from the banks while still providing institutional investors with higher earnings than they could obtain from the banking system.

The main features of commercial paper are:

(a) Commercial paper is an unsecured promissory note tied to any specific transaction. It is privately placed with investors through the agency of banks or other financial institution.

(b) The issuing company should have a tangible net worth of Rs. 5 crores: enjoy a working capital limit of not less than Rs. 10 crores; be listed on stock exchange ; obtain a minimum credit rating from an approved credit rating agency, such as CRISIL; and have a minimum current ratio of 1.33.

Supplier' Credit

Suppliers' credit available for one to three months for supply of raw materials and other inputs is a source of short tem financing. With the introduction of just-in production and inventory control techniques in a right political and economic climate, situation may arise when the working capital requirements will be very little, making it possible to pay the suppliers of raw materials and other inputs from the sale proceeds of finished good.

FOREIGN CURRENCY FUNDS :

Many large projects involve expenditure in foreign exchange. All foreign exchange requirements of projects have to be approved either RBI or by the Secretariat of Industrial Approvals in the government. Once the approval is given, the enterprise can draw foreign exchange from the sources indicated in the approved application.

Free Foreign Exchange from Dealers and from Development Banks

One of the sources of foreign exchange is the exchange available from commercial banks and financial institution which are authorized to buy and sell. The required amount of foreign currency can be purchased form the authorized banks or financial institutions by presenting to them the approved applications. The foreign currency so purchased can be remitted directly to the foreign party through banking channels based on bills and documents. The development financial institutions can give a loan to meet an urgent expenditure in foreign currency in connection with the project, when there is some delay in receiving the foreign currency. The development financial institutions can also disburse a part of the rupee loan previously granted, in foreign exchange to meet the import requirements of the project.

The Technical Development Funds Scheme of the government permits all existing undertaking, to import :

(i)   all types of capital equipment,

(ii) technical know-how,

(iii) technical consultancy service,

(iv) technical drawings and designs,

(v)   Technical assistance for modernization and up gradation of technology.

The objectives in permitting these imports is to:-

i)   enhance significantly the export potential,

ii)   cost reduction,

iii) capacity utilization,

iv)   technology up gradation,

v)   product diversification, modernization and / or rationalization of product mix

vi)   more efficient utilization or conservation of raw material/inputs, and

vii) energy saving.

The assistance under this scheme is up to US 50 million dollars per unit. This amount can also be used for meeting part of import duty and incidental expenses, subject to a maximum of 25 per cent of CIF value of import license. As amount up to Rs. 10 million in foreign exchange per annum per unit is allowed by RBI for the import of designs and drawings.

External Commercial Borrowings

External Commercial Borrowing (ECB) is the amount borrowed by the Government through designated agents form All India Financial Institutions (AIFI). The government borrowed these amounts in the international money market during 1991 and 1992 to meet the massive exchange deficits. The lenders include Asian Development Bank (ADB) and International Monetary Fund (IMF). Any existing undertaking is permitted to make direct commercial borrowing if the Department of Economic Affairs is satisfied with the proposal submitted do it. Direct external commercial borrowing of the total foreign exchange requirements may be permitted while the other part should be financed through rupee payments quadrilateral aid or free foreign exchange releases. In general, the government's policy's to discourage individual undertaking directly making external commercial borrowings. But if a project is 100 per cent Export Oriented unit (EOU), the entire foreign exchange component is allowed to meet through direct external commercial borrowings.

There are two main sources of commercial borrowings:

(i)   mobilization of funds in the international money market, and

(ii) Export credit.

All borrowings in the international market are handled by All India Financial Institutions. They borrow in their name and lend them at a higher rate in India. Undertaking with good track record and capable of getting a good credit rating by a reputed credit rating agency can succeed in mobilizing large amounts of money in the international money market. The credit rating of an undertaking depends on :

(i)   management philosophy,

(ii)   country's credit worthiness,

(iii) the importance of the undertaking in the industry and the country's economy,

(iv)   the importance of the industry to which undertaking belongs,

(v)   operating efficiency and market position,

(vi)   Accounting policies, and a comparison of key performance indices with those of competitors.

There are three options under ECB:

(i)   **Raising loans from foreign commercial banks**

In order to raise loans from foreign commercial banks the undertaking, should enter into negotiations with the willing banks and obtain "in principle" consent from the bank and place the bank's consent before the Department of Economic Affairs (DEA). After the terms and conditions of the proposed borrowings are examined and approved by DEA, the undertaking can sign the loan agreement with the bank. Corporate borrowings must also

receive the approval of the Department of Company Affairs (DCA). The RBI's exchange control department will authorize the borrowing after receiving the copy of loan agreement with the copies of approvals from DEA and DCA. After receiving RBI authorization and undertaking's compliance of the terms and conditions, the foreign commercial bank will disburse the loan. Sometimes, two or more foreign banks give a loan, called a syndicated loan, which is similar to consortium lending. One of these banks will act as the lead bank which manages the loan.

(ii) Raising funds, by floating bonds, in the international market

Funds can be raised by floating bonds in the international markets, after securing permission from DEA. This task of raising funds through bonds is generally entrusted to specialized international financial services agency. In the last couple of years, several undertakings have raised funds through bonds in the international money market.

(iii) Supplier countries export credit

Supplier countries export credits are of two types-supplier's credit and buyer's credit. Both these types of credits come under the financial assistance extended to exporters in industrially advanced countries for promoting exports to developing countries. Under the buyer's credit scheme, the undertaking, as a buyer, enters into an agreement with overseas supplier with deferred payment conditions. The overseas supplier realizes his money immediately from his country's banking system. They, in turn, collect the deferred installments with interest at agreed rates from the undertaking through the Indian banking system. The credit resulting from this kind of transaction is insured under export credit guarantee insurance. Thus, the insurer also is a party to the agreement with the overseas supplier. Under the supplier's credit scheme, the overseas supplier gets finance from his bank for the supplies made. His bank finances him for the agreement concluded with the importer on the basis of importer's promissory notes supported by an irrevocable letters of guarantee issued by the importer's bank or IDBI with the approval of RBI. Export credits are more desirable than commercial borrowing because of comparatively lower interest rates and repayment period besides grace period covering the construction phase.

External Aid

External aid, available only through the government, is of two types- bilateral aid and multilateral aid.

Bilateral aid as the name implies, is an aid form one government to another government. Generally the donor is an industrially affluent one, and the recipient or beneficiary belongs to developing or underdeveloped country. The Overseas Economic Cooperation Fund of Japan and Overseas Development Administration of UK are examples of this nature. The assistance from the developed countries are conditional, tied to buying their equipment and known how. They are project specific, designed to finance particular projects of interest to them. There is special financial aid extended by foreign governments on a product sharing basis. An example is the assistance from Iran government for the Kudremukh iron ore project which provided for sharing of iron ore with Iran for a certain number of years at an agreed price until the assistance is paid back. A third category is the special assistance offered by

rich Gulf Countries (Saudi Arabia, Kuwait, UAE) to developing countries at concessional interest rates and on easy repayment terms.

Multilateral aid is available from international financial institutions like the Word Bank group, consisting of International Bank for Reconstruction and Development (IBRD), International Development Association (IDA), International Finance Corporation (IFC) and Multilateral Investment Guarantee Agency (MIGA), and the Asian Development Bank (ADB). The member countries of these institutions subscribe huge sums of money. These institutions also borrow in the international capital market. They lend to member countries who wish to invest in development projects. ADB is relatively small with only 47 member countries, concentrating on the economic and social development of developing member countries of Asia-Pacific region.

IBRD raises funds through the sale of AAA credit rated bonds in international capital market. It lends funds to the credit worthy developing countries with relatively high precipitate income. The rate of interest varies and set at half percent higher than its average borrowing rate. The repayment period is 12 to 15 years with a grace period of 3 to 5 years. Loans are given to governments or to agencies which produce a guarantee from the government.

IDA provides assistance on concessional terms to the poor developing countries that are not sufficiently credit worthy to deserve aid from IBRD. IDA receives its funding from contributions made by wealthier member countries. The IDA assistance is for longer periods of 35 to 40 years. it does not charge any interest but collect 0.75% annual service charge. IDA is also made only to governments.

MIGA encourage foreign investment in developing countries by providing guarantees to foreign investors against losses caused by non commercial risks. It is providing guarantees to foreign investors against losses caused by non commercial risks. It provides advisory services to developing member countries on how to improve their environment for foreign investment.

UNDP Country Programme almsgivers project assistance for technical cooperation with selected national development objectives. The UNDP assistance comprises of funding for provision of personnel for technical assistance, project management training in specialized fields, supply of special equipment etc.

External aid is offered in the form of –

(i)   soft loans,

(ii) grants,

(iii) mixed credits,

(iv) technical assistance, and

(v)   Commodity assistance.

Soft loan is offered on a government to government basis, either free of interest or at a very low rate of interest. Repayment period for these loans is up to 50 years with a grace period of 10 years. Grants are given by some countries out of the funds earmarked for assisting poor countries. Mixed credits are partly soft loans at low rate and partly commercial loan at normal rate of interests. Technical assistance is extended under individual agreements for technical cooperation programmes, like the UNDP programmes. Commodity assistance as the name

suggests given in the form of commodities like fertilizers, milk powder, oil etc. the sale proceeds of these commodities are used for specific projects.;

Assistance from International Finance Corporation

The IFC provides financial assistance to the private sector in the developing member countries. The assistance takes the form of equity participation loan, usually in collaboration with other investors. The DEAs clearance is necessary for any undertaking in the private sector to approach IFC for financial assistance. It can grant loans in the currency of the member country or Switzerland for meeting foreign currency expenditure. The equity participation is only in the currency of the member country. Normally the amount of assistance is between 5 and 50 million US dollars subject to a maximum of 25 per cent of the project cost. Loans are repayable in 7 to 12 years with normal interest and usual commitment charges on undisguised amounts of sanctioned loans. IFC does not require any guarantee from the government.

Investment from Oil Exporting Developing Countries

An important source of foreign assistance is the investments from institutions and individuals from oil exporting countries in Africa and Persian Gulf which are not industrially advanced. Such investments can be in equity, loans, debentures, bonds, etc. subject to certain limits and restricted to new enterprises, hotels and hospitals. Clearance from RBI is needed for such investments.

Collaborators Equity participation

Equity participation by collaborators is the widely accepted form of foreign investment. Until 1991, foreign collaborations are not encouraged and there was limit on the extent of equity participation by foreign collaborators. After the government's liberalization policy in 1991, collaboration is allowed in more areas and the limit for equity participation by foreign collaborator is increased, even allowing the foreign collaborator to have a majority shareholding. During the last 2 to 3 years the number of foreign collaborations approved by government increased substantially and the direct foreign investment reached 10 billion US dollars. This is considered very small when compared with the direct foreign investment in China.

Share Subscription by Overseas Investors

Individual and institutional investors in the developed countries evinced considerable interest in equity participation in large Indian Industrial houses with good track record. Euro convertible bonds and global Depository Shares (GDS) of prominent Indian companies have become popular instruments abroad. Euro convertible bonds are convertible later into stock.

The Indian Government allowed several large companies- Reliance Industries, Tosco, Grassim Industries, Essar Gujrat- to raise equity abroad, and they decided to make private placement offerings of their shares. Morgan Stanley International and Lehman Brother managed the public placement offering of Reliance Industries. They raised 175 million US dollars: the issue in the form of GDS was over subscribed five times ICICI acted as the custodian of shares and the Bank of New York as the depository. The investors consisted of mutual funds, pension funds and some wealthy individuals from USA and countries in Far East. This is as

source which the large going concerns and mighty promoters with excellent background capable of generating investor confidence in new projects can consider. The foreign exchange cost will be only the dividends pm types equity shares.

Share Subscription by Non-resident Indians

One of the long term sources of foreign exchange to meet the project's foreign exchange component of cost is the share subscriptions by NRIs in foreign exchange. Depending on the mix of financing and the total amount of requirements, the NRIO equity may be sufficient to meet the entire foreign currency requirement.

FINANCIAL INSTITUTIONS

A number of financial institutions have been established in India, which represent the major providers of finance for industrial projects. These cans be broadly divided into All India Financial Institutions and State level Financial Institutions. The All India Institutions are:-

i)   Industrial Finance Corporation of India, (IFCI)

ii)   Industrial Credit and Investment Corporation in India (ICICI),

iii)   Industrial Development Bank of India (IDBI),

iv)   Life Insurance Corporation of India,

v)   Industrial Reconstruction Corporation of India,

vi)   Unit Trust of India,

vii)   National Small Industries Corporation Ltd.(NSIC)

The state level institutions are the State Finance Corporations and the State Industrial Development Corporations.

Industrial Finance Corporation of India (IFCI)

IFCI, established in 1948, extends financial assistance to public limited companies, public sector undertakings, and cooperative societies engaged in manufacturing and other activities. It receives applications for assistance exceeding Rs 30 Lakhs. The assistance provided by IFCI is in the natures of granting long term loans, both in rupees and foreign currency: underwriting of equity, preference and debenture capital: offering guarantees for deferred payments in respect of machinery imported from abroad or purchased within the country: and guaranteeing loans raised in foreign countries in foreign currency. It played a vital role in financing projects in less developed areas. Projects set up in less developed areas receive concessional finance, such as lower rate of interest, longer initial grace period, extended repayment period, reduced security margin, lower contribution from promoters towards project cost, larger participation in equity and preference capital, lower commitment fee, reduced underwriting commission and lower charges for processing applications and legal services.

Industrial Credit and Investment Corporation of India (ICICI)

ICICI, established in 1955, offers assistance to private sector enterprises, regardless of form of organization, to meet foreign exchange requirements. There are no restrictions on the size

of the enterprise, and there is no maximum or minimum limit on the investment. But, in practice, the lower limit for financing limited companies is at Rs 5 lakhs. The nature of ICICI's financial assistance is in the form of long term and medium tem loans, not in rupees and foreign currencies: underwriting of equity, preference, and debentures issues: subscription to equity capitals: and guaranteeing repayments of loans from other sources.

Industrial Development Bank of India (IDBI)

IDBI, setup in 1964, is the apex financial institution in India, entrusted with task of coordinating the working of various institutions engaged in financing, promoting, or developing industry, for assisting the development of such institutions, and for providing credit and other facilities for the development of industry. IDBI is responsible for all these, within the framework of priorities established at the national level.

IDBI can finance all types of industrial concerns. But usually it concentrates on projects, as direct financing is concerned, which are large and complicated and which involve huge capital outlay or sophisticated technologies. It also considers giving financial assistance to projects located in less developed area, and to projects promoted by technocrats.

IDBI's purpose is to supplement the activities of other financial institutions and hence prefers not to assist units whose requirements can be met by other institutions.

Other All –India Institutions

Industrial Reconstruction Bank of India (IRBI)

The IRBI is an agency which was established in 1975 to help the rehabilitation and reconstruction of industrial undertakings which have been closed or face the risk of closure. The IRBI's assistance takes various forms. These include: financial assistance which is not available from normal channels of finance and banking technical assistance and guidance to sick units to revive them: managerial assistance in all the functional areas of management: and suggestions for rehabilitation and reconstruction. The main activity of IRBI is granting reconstruction loans and guarantees on soft terms.

Life insurance Corporation of India (LIC)

LIC came into being in 1956 following the nationalization of life insurance business. While LIC's primary activity is life insurance business, it has grown into a development finance institution and maintains close relationship with other financial institutions. The financial assistance provided by LIC is in the nature of granting term loans, subscription to or underwriting of new issues of shares and bonds/debentures, investment in shares and bond/ debentures of public sector undertakings as well as public limited companies in private sector.

Unit Trust of India (UTI)

The main objective with which UTI was established in 1964 is to mobilize savings from public and channeling them into productive corporate investments. Its main resource is the unit capital raised through sale of units to the public. UTI renders assistance to industry in three ways. First, by subscribing to new issues of equity and bonds/debentures: second, by

underwriting of new issues of equity and bonds/debentures, and finally, by purchasing outstanding securities in the secondary market thereby releasing funds for new investment by other investors.

National Small Industries Corporation (NSIC)

NSIC was established in 1995 with the intention of aiding, counseling, assisting, financing, protecting and promoting small industries. Its resources consist of paid up capital, borrowings and loans from banks. The assistance provided by NSIC consists of : supplying machinery on hire purchase basis to small scale industrialists: helping to secure contracts from Central Government Stores Purchasing Agencies: training industrial workers and supervisors: distributing new materials which are scarce: and exporting products of small industries.

Though NSIC does not provide direct finance, its hire purchase scheme provides a mechanism, by which finance is made available for acquiring machines. The rate of interest charged under this scheme depends on the total investment of the unit in plant and machinery, location of the unit, and the promoter's track record and background. The hire purchase value is recovered in 13 half yearly installments with a grace period of one to one and half years.

State Level Financial Institutions

State Financial Corporations (SFC)

The State Financial Corporations are set up in each state to render assistance to medium and small scale industries in their respective states. Small scale units with a paid up capital and reserves exceeding one crore of rupees are not eligible for assistance from SFCs the maximum amount of assistance to a single unit is Rs 30 lakhs in the case of limited companies and Rs.15 lakhs in other cases. SFCs provided assistance mainly to meet the needs of small scale units engaged in manufacturing or related industrial activity.

SFCs mainly provide land for acquiring fixed assets like land and buildings, plant and machinery. SFCs also render other types of assistance in a limited way. These include: underwriting capital issues, subscribing to capital issues: guaranteeing loans raised by industrial undertakings: guaranteeing deferred payments due from any industrial undertaking in connection with the purchase of capital goods within the country.

The lending rates of SFCs vary between 8.5 to 14.5 per cent depending on the borrower profile and the nature of industry. SCFs charge confessional interest rates-half per cent to six per cent less than the normal lending rate-to small scale industries, industries in backward areas, and units set up by technically qualified entrepreneurs. The repayment period is 10 to 12 years, and the loans are secured by a first charge on the fixed assets of the borrower's unit.

State Industrial Development and Investment Corporations (SIDC)

The SIDCs were set up in 1960s by the state governments to serve as catalytic agents to accelerate the process of industrialization in their respective states. The activities undertaken by SIDCs include: granting financial assistance: providing industrial sheds/plots: identifying projects opportunities : providing technical and managerial assistance during project

implementation: and serving as agents of the state/central government in operating their schemes for providing special incentives.

While SIDCs give some support to small scale industrial units, a major part of their assistance goes to medium sized undertakings. Investment Guidance Cells have been established by SIDCs to identify potential entrepreneurs and provide active guidance to them. In order to promote rapid industrialisations, SIDCs sponsor projects in joint sector with the participation of private parties. Most of joint sector projects set up have been in non-traditional industries.

Students are advised to read detailed coverage of various forms of financing including certain latest developments in some of the latest editions of standard text books like 4th edition of Prasanna Chandra on PROJECTS Planning , Analysis, Selection, Implementation and Review.

Expenses during Construction Period

A new company, during the period of construction, incurs expenditure on various items. Expenses directly related to construction reconsidered as expenditure on buildings, plant, machinery, etc. Apart from these direct expenses, there are indirect expense, such as preliminary, indirect expenditure relating to construction, indirect expenditure not relating to construction, and expenditure relating to technical know how.

The following expenses are regarded as preliminary expenses:-

(a) Expenditure incurred for preparing the feasibility report, preparation of project report, market/economic/ industrial survey conducted relating to the business, and engineering services related to the business.

(b) Legal charges incurred for preparing agreement relating to the setting upon conduct of the business.

(c) Legal charges for preparing the memorandum and articles of association, prospectus: fees for registering the company with the Registrar of Companies under the Companies Act: and cost of issue of shares and debentures of the company.

(d) Ten per cent preliminary expenses can be claimed as deduction for each of the ten successive previous years beginning with the previous year in which the project is completed. The maximum amount of preliminary expenses that can be amortized is two and half per cent of the project or capital employed whichever is less.

Indirect expenditure relating to construction consists like financial charges, remuneration of various personnel engaged in construction activity, traveling and other expenses incurred in connection with the project, and depreciation of various assets used for the purpose of construction. These expenses are allowed to be capitalized by allocating them to buildings, plant, machinery, etc., on a suitable basis and the enterprise is allowed to claim depreciation on the enhanced value of these assets.

General expenses are incurred during the period of construction but which are not related to construction. Marketing expenses incurred to maintain the corporate image of the undertaking are examples of this nature. These expenses are neither allowed to be capitalized nor allowed

as tax point of view, the enterprise does not derive any benefit of charging these expenses against revenue. It is therefore advisable for enterprises to incur such expenditure after the period of construction is over and operations have commenced.

Expenditure incurred on technical know-how can be capitalized as a direct expenditure related to construction, or could be treated as plant on which depreciation can be claimed. When an existing enterprise incurs expenditure on technical know how under an agreement for the transfer of technical know-show for a limited period and not for permanent use, then such an expenditure, regardless of the involved, can be treated as revenue expenditure i.e tax deductible item of expense.

Depreciation

Depreciation on building, plant and machinery, furniture and fittings used for business/ profession is a tax claiming allowance. The assets should be owned and used for business purposes, and the prescribed particulars relating to depreciation should be furnished as per Section 34 (i) of I.T Act.

The features for allowing depreciation claim are:-

  (i) each asset is depreciated separately at a rate applicable to it which varies between two and half per cent and 100 per cent,

 (ii) straight line method of depreciation is permitted for ships plying on international waters, and the written down value method of depreciation is remitted for all other assets,

(iii) extra shift allowance is permitted on certain items of plant and machinery,

(iv) additional depreciation equal to 50 per cent of normal depreciation is allowed in the year of installation, and

 (v) when the asset is sold or discarded adjustments are effected in respect of the resultant loss or gain as terminal allowance or balancing charge.

The above features have been in force for quite some time. Two important changes relating to depreciation have been introduced with effect from the assessment year 1977-99. First depreciation is charged on blocks of assets which represent a group of assets, for which a common rate of depreciation is applicable. Depreciation is calculated by applying the prescribed rate, which may be 33.3 per cent or 50 per cent or 100 per cent [to the written down value of the entire block], Second, the net amount realized from the sales of assets is simply deducted from the written down value of that block: the written down value of a block cannot be reduced to zero. If the net sale proceeds of an asset exceed the written down value of the block, the difference will be treated as capital gain and taxed accordingly, and depreciation will be zero.

Investment Deposit

The Investment Deposit Scheme was introduced in the assessment year 1987-88 replacing the previous Investment Allowance scheme. Under the Investment Allowance Scheme a business firm was allowed to deduct an amount equal to 25 per cent (in some cases 35 per cent)

of the cost of plant and machinery under certain conditions. The unabsorbed investment allowance was allowed to be carried forward for a period of eight years.

The investment allowance benefit was related to the outlay on plant and machinery. The investment Deposit Benefit is a function of profit. The deposit made with IDBI, Tea Board, or NABARD, as the case may be can claimed as deduction for tax purposes. This is however, limited to 20 per cent of profits as per financial accounts prepared in accordance with Companies Act provisions.

In order to avail the benefit under the investment deposit scheme, the following conditions must be satisfied-

(a) The deposit should be made within 6 months from the end of the previous year or within the time prescribed for filing the return of income. If investment is made directly in eligible plant and machinery, then no deposit need be made.

(b) The accounts of the business/ profession are fully audited.

(c) The withdrawal of deposit is allowed only for specific purposes. These include purchase of eligible plant and machinery and repayment of loans borrowed from approved financial institutions after 31st March,1986. Eligible plant and machinery does not include :

   (i) plant and machinery installed in a large company manufacturing items specified in the Eleventh Schedule,

   (ii) plant and machinery installed in office premises, residential accommodation, or guest house,

   (iii) office appliances other than computers,

   (iv) road transport vehicles, and

   (v) any asset.

(d) the plant and machinery purchased by withdrawing the deposit should not be transferred for a period of eight years. Such transfers to government companies, or when a firm is converted to a company, are exempt form this condition.

FOREIGN COLLABORATION :

In a project environment, foreign collaborations are normally entered into by industries where a sophisticated technology (not available indigenously) is required or where up-gradation of existing technology is necessary, or, where import of technology and capital is involved (e.g. petro chemical and fertilizer industry). Foreign collaborations could be purely technical collaboration where only transfer of technology is involved or technical cum financial collaboration involving both transfer of technology and capital. All proposals for setting up foreign collaboration require prior approval of Government. Government approval is guided by considerations of the NEED AND APPROPRIATENESS of the technology to the growth of the industry, FOREIGN COLLABORATION PROJECTS are to be approved any Government and have special tax implications. Various aspects of Foreign Collaboration project could be broadly classified under 3 different sections, viz-

1. Outline of the governmental policy framework governing foreign collaboration.
2. Procedural aspects of setting up a collaboration project.
3. Tax aspects of foreign collaboration.

Governmental Policy Framework

It details with:

A) Need For Foreign Technology
B) Royalty Payments
C) Terms and Conditions of Collaboration Agreement
D) Foreign Investment

Considerations for Foreign Technology

Nexus between development of industry (involving Foreign Exchange) and national priorities :

Criticality of technological gaps in industry in terms of efficiently meeting domestic requirements and / or becoming competitive in export market.

Export potential of project.

Availability of similar indigenous technology and time frame required to develop such technology.

Commercial viability to absorb, adapt and develop imported technology through adequate investment in R & D.

If one or more or above considerations are satisfied and the project is economically viable, approval is given. it is necessary to examine all possible sources and do a techno-economic evaluation of such technology in each source and give reasons for preferring the particular source.

Study Note - 8

INTERNATIONAL FINANCE

8.1 Risk – Management of Risk

This Section Includes :

- **Meaning and Steps in Risk Process**
- **Principles of Risk Management**
- **Risk Drivers**
- **Approaches to Risk Management**
- **Risk Management And Minimisation of Risk**
  - **Internal Hedging Tools**
  - **External Hedging Tools**

INTRODUCTION :

Risk Management is one of those ideas, the sense that a logical, consistent and disciplined approach to the future's uncertainties will allow us to live with them prudently and productively, avoiding unnecessary waste of resources. It goes beyond faith and luck, the twin pillars of managing the future before we began learning how to measure probability. As Peter Bernstein wrote, "*If everything is a matter of luck, risk management is a meaningless exercise. Invoking luck obscures truth, because it separates an event from its cause.*"

Thus now Risk Management as a subject had assumed its destined role of preparing us to take the future in our stride and excel in an environment where everything is in a state of flux. Indian financial organizations should not underestimate the potential impact of inadequate risk management practices.

MEANING AND STEPS IN RISK PROCESS :

Risk may be defined as the probability of incurring a loss or damage. In other words risk can be defined as the chance that the actual outcome from an activity will differ from the expected outcome. This means that, more variable the possible outcomes that can occur (*i.e.* broader the range of possible outcomes), the greater the risk.

Risk management means a course of action planned to reduce the risk of an event occurring, and minimizing or containing the consequential effects should that event occur. In order to achieve this, a risk management policy should be put in place. Such a policy will need to be approved by the senior management, and responsibilities acknowledged.

It is also important for the senior management to recognise that it is necessary to organise, manage and encourage everyone within the institution to assist in managing risk. Training at all levels is essential, and people need to be aware of the risks and of the steps which can be taken to prevent threats becoming a reality. It should also be recognised that risk management is not just an estate-related issue, but applies across the whole of the activities of an institution. In corporate and banking sectors most of the efforts till date concentrated on the aspect of risk measurement and control process, not risk management. The difference between the concept of risk management and measurement and control is that the latter is more concerned with the prevention of financial losses, while a true risk management uses the information of the risk and uses the same to understand the business and proactively manages the exposures of the organisation. Thus risk management is process of understanding the risk exposures of the organisation and re-turning it to as per the risk appetite of the organisation to limit the future losses. Thus risk management is one of the important areas, which requires the skills of a financial engineer.

Accordingly the process of risk management consists of the following steps :

1. Identifying the risk to which the organisation is exposed to,

2. Quantifying the risk exposures,

3. Determination of the form of the outcome sought,

4. Design or engineer a strategy to transform the risk exposures into the desired form.

5. Monitoring risk levels and matching them to standards set.

Process of Risk Management

- To manage risk—not to react to it. This may involve developing a risk strategy, or at the minimum a set of formal risk management procedures.

- To make sure that risk management is embedded within the overall planning and management process, particularly procedures.

- To ensure the Board of Directors and Senior Management are fully informed of risks associated with various projects or issues.

- To provide appropriate training.

Many organisations worldwide try to avoid risk by focusing on supposedly low-risk areas. This is an unviable strategy. Risk is not limited to exotic products, instruments or markets but is inherent in the most mundane of them.

PRINCIPLES OF RISK MANAGEMENT :

In dealing with the key concepts of risk management and their application to estate management, the estate manager has to be able to identify the main classes of relevant risk and to apply models for determining the exposure of the institution to risk. In addition, the estate manager needs to identify the level of control that can realistically be exercised over particular risks.

Risk can have different meanings but a common understanding is that the event associated with the risk could actually happen, and the consequences of this risk might not be pleasant. Definitions of risk must always relate to the risk of something happening in a specific time period.

When preparing a plan for the future, the further that these predictions are projected, the greater the increase in associated risk and uncertainty. It is also important to be clear about the distinction between risk and uncertainty. An assessment of risk is an attempt to quantify events about which some knowledge exists. Uncertainty, on the other hand, is concerned with events that cannot be measured. Both risk and uncertainty may result in outcomes that are better or worse than expected.

The logical process of risk management may be defined as:

- Identification of risk / uncertainties;

- Analysis of the implications (both individually and collectively);

- Response to minimize risk; and

- Allocation of appropriate contingencies.

Risk management should be an essential part of the continuous and structured planning cycle within an institution. Furthermore, risk management needs to be seen as a process that:

- Requires an acceptance that uncertainty exists;

- Produces structured responses to risk in the form of alternative plans, solutions and contingencies;

- Requires an imaginative and flexible thinking process; and

- Can change attitude in project staff by preparing them for risk events.

Risk exists when a decision is expressed in terms of a range of possible outcomes and when known probabilities can be attached to the outcomes.

Uncertainly exists when there is more than one possible outcome of a course of action but the probability of each outcome is not known.

In terms of using risk management to develop a safe system of work, five key elements can be identified:

- Plan or identify hazards;

- Organise or assess the risks associated with the hazards;

- Institute control measures;

- Monitor the control measures; and

- Review the system.

Getting Ready to take on Risks

The need to add a new dimension to risk management practices-hedging from disasters-is becoming imperative.

The September 11th attack (in 2001) jolted finance professionals from their complacency, as many of them were unprepared to deal with a disaster of such magnitude. Several companies have suffered huge losses in their work force and offices have been permanently damaged. The incident, however, has prompted a paradigm shift in risk perception. Risk assumptions have been enlarged to include factors ranging from basic transportation to inventory policy.

Ford, for instance, had to close down its assembly because of disruption in the supply of parts, a consequence of the attacks. On the other hand, **PG&E Corp.,** developed alternate sites to ensure continuity in business operations. Finance professionals have realized the risk involved in depending on a single vendor for supply, and the need to have alternatives in place.

Role of Finance in Disaster

When disasters happen, the first response is to ensure safety and prevent additional losses. Following the attacks on its office located in the WTC, **Freilich** decided to invest in safety gear and generators. The finance department was on alert for 10 days, racking the flow of funds on an emergency basis.

The **Financial Accounting Board (FASB)** in the mean time has ruled that losses emanating from the attack should not be treated as an extraordinary item in the books of accounts. Hence, companies need to change their accounting systems to absorb such events into regular accounting practices.

Debt in Sources of Capital

Financial institutions that provide capital for business were also destroyed in the attacks. Though capital markets have been restored physically, investor confidence is at its lowest ebb. Such situations not only make it difficult for companies to raise capital, but also make them realise that they cannot depend on a single source of capital.

Risks may be categorized as follows:

- Those for which identified statistics are available;

- Those for which there may be some evidence but where the connection between the possible cause and effect cannot be established;

- Expert assessment of probabilities of events that might happen; and

- Making an assessment of probabilities of events based solely upon subjective judgment.

Risk analysis, a component of the risk management process, deals with the causes and effects which cause harm. The aim behind such analysis is a precise and objective calculation of risk. To the extent that this is possible, it allows the decision making process to be more certain.

The likelihood of an adverse event happening can generally be estimated both with regard to its frequency and severity. Such an event can have a wide variety of characteristics which will have varying degrees of seriousness, depending upon the nature and extent of the damage and the perception which others may have of it.

Each project or activity can have many associated risks, and these risks can vary depending upon technology, funding, organizations involved *etc.* However, in broad terms, the key sources of project or process risks are essentially the same.

RISK DRIVERS :

- Commercial risk
- Financial risk
- Legal risks
- Political risks
- Social risks
- Environmental risks
- Communications risks
- Geographical risks
- Geotechnical risks
- Construction risks
- Technological risks
- Operational risks
- Demand / product risks
- Management risks

These sources of risks relate to project-specific and non-project-specific risks, as both these types of risk need to be considered when identifying the risks in a project or a process. The institution, assisted by the project team, need to define the boundaries of these sources and to break down these sources into detailed risk elements. This will allow a common understanding amongst those attempting to identify the risks in a project.

The division of risks into source elements can be difficult. It also creates the potential for increased personal subjectivity. It can also lead to the possibility of 'double-counting' some risks by attributing the same risk to more than one source. This may, however, be beneficial in understanding the relationships between risk sources and elements.

APPROACHES TO RISK MANAGEMENT :

A formal approach needs to be developed for managing risk. This should consist of a set of procedures laid down by an institution for use in the risk management process. These procedures should be structured and provide guidelines to be followed, so that they can be used by any member of the institution. This enables a uniformity of approach to be achieved. This formalizing of risk management processes and procedures ensures that the overall approach is more objective and rigorous than an informal approach.

Formalized procedures for the management of risk in projects should be designed to suit the needs of the particular institution. However, there are frameworks for formalized risk management procedures which, whilst not detailing the methods that should be used, do allow the user the scope for choosing appropriate techniques.

The standard model is divided into three parts :

- Risk identification;
- Risk analysis and
- Risk response.

Risk identification should normally be carried out during the appraisal, of the project or process, although it can, if required, be carried out at any stage of the project. If the project risks are identified at the appraisal stage then the information can be used to choose between projects, and assess options for a single project, as well as establish constraints on the project.

Risk analysis involves assessing the identified risks. This first requires that the risks are quantified in terms of their effect on cost, time or revenue. They can be analysed by measuring their effects on the economic parameters of the project or process. In terms of risk response, three general types of response can be identified:

- Risk avoidance or reduction;
- Risk transfer and
- Risk retention.

Explicit decisions are needed as to what type of response is to be pursued, and why.

The quality of a formal process of risk management is generally accepted to be dependent upon:

- Management awareness;
- Motivation among project personnel;
- A methodical approach;
- The information available;
- The assumption and limitations upon which the risk analysis is based;
- The qualifications and knowledge within the project or by staff generally; and
- The experience and personality of the risk analyst(s) leading the process.

Risk can be reduced by :

- Obtaining additional information;
- Performing additional tests / simulations;
- Allocating additional resources; and
- Improving communication and managing organizational interfaces.

Common problems

There are number of assessment pitfalls including:

- Expert bias, where experts are expected not to be uncertain, but to be sure of things.

- This may lead to underestimation of uncertainty;

- Not providing adequate training;

- Relying on past trends or events as a predictor of future events; and

- Not incorporating risk management fully into the overall planning & management process.

Once the different types of risk are identified, the next step involves the identification of the alternative approaches available for managing and reducing the Risks. These may be stated as follows:

1.   Avoidance

The concept of risk is relevant if an organization is holding an asset / liability, which is exposed to risk. Avoidance refers to not holding such asset / liability as means of avoiding the risk. Exchange risk can be avoided by not holding assets / liabilities denominated in foreign currencies. Business risk is avoided by not doing the business itself. This method can be adopted as more of an exception than as rule since any business activity necessitates holding of assets and liabilities.

This approach, for example, has application when a bank is deciding to limit its exposure limits. For example a bank may decide to avoid a particular industry that may have a greater risk exposure, so while extending credit it may stop any such advances to all the borrowers of that industry. The Board must take such decision on the recommendation of the appropriate research wing of the Bank.

2.   Loss control

Loss Control measures are used in case of the risks which are not avoided. This Risks might have been assumed voluntarily or because they cannot be avoided. The objective of this measure is either to prevent a loss or to reduce the probability of loss. Insurance for example is a control measure. Introduction of systems and procedures, internal or external audit help in controlling the losses arising out of personnel factors.

Raising loans through floating rate instruments can reduce the losses due to interest rate fluctuation.

3.   Separation

The scope for loss by concentrating an asset at a single location can be reduced by distributing is to different locations. Assets, which are needed for routine consumption, can be placed at multiple locations so that the loss in case of any accident can be minimised. However this does simultaneously increase the number of Risk Centres. For example a multinational corporation with a spread out operation will be able to cope up with the economic slowdown better than a company that has concentrated its operation in one state only.

A company having different plants in different location may not sound cost effective, but surely this reduces the risk of the business.

4. Spread

This is as per the old adage of not putting all the eggs in a single basket. The risk of default is less when the financial assets are distributed over a number of issuer instead of locking them with a single issuer. It pays to have a multiple suppliers of raw material instead of relying heavily on a sole supplier. A well-diversified bank has a lower risk of experiencing a recession. The non-life insurance companies should not concentrate on insuring companies belonging to one particular sector.

5. Transfer

Risk reduction can be achieved by transfer. The transfer can of three types.

In the **first type** the risk can be transferred by transferring the asset / liability itself. For example the risk arising out of holding a property or foreign currency security can be eliminated by transferring the same to another.

The **second type** of transfer involves the transferring the risk without transferring the asset / liability. Examples of such transactions are the forward contracts and swap deals entered into.

The **third type** of transfer involves making a third party pay for the losses without actually transferring the risk. An Insurance policy covering the third party risk is an example of this type. When a bank takes a policy to cover the losses incurred on account of misuse of lost credit cards, it is in effect finding someone to finance the losses while it still has the obligation to pay the merchant establishment.

Factors affecting Flow of Foreign Capital

The following are some of the factors that may affect the flow of capital into any country.

1. The expected rates of return or rates of interest on investments;
2. Attitude of investors for investment in overseas capital market;
3. The credit standing of the country where the investment is to be made;
4. The internal economic, social and political stability of a country;
5. The relative stability in rates of exchange of currencies of the two countries;
6. The business cycle phase whether passing through depression or boom of a country.
7. The gap between savings and investment resulting in current account gaps of the country.
8. The policies of globalisation, liberalization and that of international integration adopted by the country;
9. Flexible legal and institutional structure of the country which can be easily understood by the investors; and
10. Availability of innovative financial products in the financial markets etc.

RISK MANAGEMENT AND MINIMISATION OF RISK :

Hedging

In international parlance, Hedging means a transaction undertaken specifically to offset some exposure arising out of the firm's usual operations.

In the stock market parlance, hedging is the process of buying one selling another in order to produce a risk less security. Hedging involves two investments that are perfectly correlated. For example if the returns of A and B are perfectly correlated, then to hedge, one has to buy A and sell B or vice versa to make the net position risk less. Hedging is a mechanism to reduce price risk inherent in open positions. The following are the hedging devices or instruments available to the investors, and the speculators.

INTERNAL HEDGING TOOLS :

A firm may be able to reduce or eliminate currency exposure by means of internal strategies such as:

- Currency invoicing

- Netting and offsetting

- Leading and Lagging

- Indexation clauses in contracts

- Switching the Base of Manufacture

Currency Invoicing

A firm may be able to shift the entire exchange risk to the other party by invoicing its exports in its home currency and insisting that its imports too be invoiced in its home currency. In order to avoid the exchange rate risk, many companies try to invoice their exports in the national currency and try to pay their suppliers in the national currency as well. This way an exporter knows exactly how much he is going to receive and how much he is to pay, as an importer.

This method is a noble one. However, an enterprise suffers under this method if the national currency appreciates; this is likely to result into a loss of market for the products of the company if there are other competitors.

Companies may also have recourse to invoicing in a currency whose fluctuations are less erratic then those of the national currency. For example, in the countries of the European Union, the use of European Currency Unit (ECU) is gaining popularity.

Netting and Offsetting

A firm with receivables and payables in different currencies can net out its exposure in each currency by matching its receivables with payables. For example, a firm with exports to and imports from France need not cover each transaction separately; it can use a receivable to settle all or part of a payable and take a hedge only for the net Francs payable or receivable.

This technique consists of accelerating or delaying receipt or payment in foreign exchange as warranted by the position / expected of the exchange rate.

The principle involved is rather simple

If depreciation of National Currency is apprehended, importing enterprises like to clear their dues expeditiously in foreign currencies: exporting enterprises prefer to delay their receipt from their debtors abroad. These actions, however, if generalized all over the country may weaken the national currency. Therefore, certain countries like France regulate the credit accorded to foreign buyers to avoid market disequilibrium.

The converse will hold true if an appreciation of national currency is anticipated; importing enterprises delay their payments to foreigners while the exporting ones will attempt to get paid at the earliest. These actions may have a snowballing effect on national currency appreciating further.

Sometimes, a firm might have a receivable in one currency say, DM and a payable not in the same currency but a closely related currency such as Swiss francs; the exposure arising from the same can be offset. To explain further, for example, a loss on a payable due to an appreciation of the Swiss Franc vis-à-vis the firm's home currency will be closely matched by the gain on the receivable due to the appreciation of DM.

Netting (Internal Compensation)

An enterprise may reduce its exchange risk by making and receiving payment in the same currency. Exposure position in that case is simply on the net balance. Hence, an enterprise should try to limit the number of invoicing currencies. The choice of currency alone is not sufficient. Equally important is that the dates of settlement should match.

Bilateral

Netting may be bilateral or multilateral. It is bilateral when two companies have trade relations and do buying and selling reciprocally. For example, a parent company sells semi finished products to its foreign subsidiary and then repurchases the finished product from the latter.

Multilateral

Netting can equally be multilateral. This is taken recourse to when internal transactions are numerous. Volume of transactions will be reduced because each Company of the group will pay or be paid only net amount of its debit or credit.

Leading and Lagging

This is another way of managing exposures by shifting the timing of the exposures by leading and lagging payable and receivables. The rule of thumb is lead i.e. advance payables and lag i.e. postpone receivables in strong currencies and conversely in weak currencies.

Lead and lags in combination with netting form an important cash management strategy for multinationals with extensive intra-company payments.

Indexation Clauses in Contracts

For protecting against the Exchange rate risk sometimes, several clauses of indexation are included by exporters or importers. A contract may contain a clause whereby prices are adjusted in such a manner that fluctuations in exchange rate are absorbed without any visible impact. If the currency of the exporting country appreciates, the price of export is increased to the same extent or vice versa.

Therefore, the exporter receives almost the same amount in local currency. Thus, the exchange rate risk is borne by the foreign buyer. A variant of the above is the indexation of price to a third currency or to a basket of currencies like ECU or SDR. This clause has repercussion for both the parties to the contract.

Another variant of indexation may be that the contract incorporates a clause stipulating that an appreciation or depreciation would be taken into account only beyond a certain level, say higher than 4 or 5 percent.

There is another possibility where the contracting parties may decide to share the risk. They may stipulate that part of exchange rate variations, interving between the date of contract and payment, will be shared by the two in accordance with a certain formula, for example, half-half or one-third, etc.

Switching the Base of Manufacture

In the case of manufacturing companies, switching the base of manufacture may be useful so that costs and revenues are in the same currency, e.g. Japanese car manufacturers have opened factories in Europe.

Re-Invoicing Centre

- Re-invoicing centre of a multi national group does billing in respective national currencies of subsidiary companies and receives the invoices made in foreign currency from each one of them. It would be referable, if possible, to locate the Re-invoicing centre in a country where exchange regulations are least constraining.

- The centre itself is a subsidiary of the parent company. The principle is simple. The invoices in foreign currencies are made in the name of the Re-invoicing centre by the subsidiaries.

- And, the centre, in turn, will send out equivalent sums in national currency. Likewise, the centre makes payments in foreign currencies to suppliers and it receives equivalent sums in the national currencies from the subsidiaries concerned.

- The management of exchange risk is thus centralized at a single place. This helps in reducing the volumes of foreign currency transfers and hedging costs. However, one often encounters the problem where dates of maturity do not match. Besides, the exchange regulations in some countries may not permit Re-invoicing.

EXTERNAL HEDGING TOOLS :

A firm may select from the following techniques, to hedge a part or all of the transaction exposure :

- Forward exchange contract
- Futures contract
- Money market hedge
- Currency option hedge

Forward Exchange Contract

It consists of buying or selling a currency to settle exposures or hedge a balance sheet position. An importer can buy in advance through a forward exchange contract the amount of foreign currency needed to pay for the imports when due. Alternatively, an exporter can sell in advance the amount of foreign currency to be received against exports. If the home currency weakens, the importer makes an opportunity gain, as he will be paying less number of units of home currency and for the exporter, an opportunity loss.

Futures Contract

A futures hedge differs from a forward hedge because of the intrinsic features of futures. A receivable is hedged by selling futures while a payable is hedged by buying futures. Banks use currency futures to hedge position taken in the forward markets.

Example

A firm that buys a currency futures contract is entitled to receive a specified amount of a specified currency for a stated price on a specified date. To hedge payment on future payables in a foreign currency, the firm may desire to purchase a currency futures contract representing the currency it will need in future. By holding this contract, it locks in the amount of its home currency needed to make payment on the payables.

Money Market Hedge

1. **Hedging payables:** This involves the following steps.

    - Borrow funds in home currency;
    - Use them to purchase the foreign currency;
    - Invest the foreign currency for the period after which the foreign currency payable falls due;
    - Use the proceeds to make the payment;
    - Repay the borrowed amount together with interest.

2.   **Hedging receivables**   This involves the follows steps.

- Borrow funds in the foreign currency for the period after which the receivable is due;

- The amount to be borrowed should be equal to the amount of the receivable as discounted by the prevailing rate of interest;

- Convert the borrowed amount into home currency and use it till the receivable arrives;

- If the home currency funds cannot be used gainfully in the enterprise itself, invest them to earn interest.

Currency Option Hedge

On buying a currency option, the owner gets the right to buy or sell currency but is not obliged to do so. This type of hedge would insulate the firm against adverse exchange rate movements and also the firm to benefit from favourable exchange rate movement.

Currency option hedging could be extended to payables and receivables in foreign currency.

- **Hedging payables with currency call options (right and not the obligation to buy):** Assume a firm has payables in British pounds. If the spot rate of the pound remains lower than the exercise price throughout the life of the option, then the firm that needs pounds could let the option expire and purchase them at the existing spot rate. On the other hand, if the spot rate of the Pound appreciates, the option allows the firm to purchase pound at the exercise price.

- **Hedging receivables with currency put options (right and not the obligation to sell):** If the existing spot rate of the foreign currency is above the exercise price when the firm receives the foreign currency, the firm can sell the currency received at the spot rate and let the put option expire.

8.2 Risk – Diversification

This Section includes :

- **Risks in Different Stages of M & A**
- **Risk Management Few Issues**

INTRODUCTION :

Managers generally adopt a *risk management approach* in the planning and implementing stages to ensure that the merger is a success.

During restructuring, risk management identifies obstacles and pitfalls at every stage of the M&A life cycle that could hinder the combining companies' ability to capture synergies. Such an approach is helpful in determining the potential performance of the two companies had they remained as separate entities, thereby highlighting the real benefits that would result from the merger. This process also compares the performance of the merged entity with other competitors, highlighting additional value created by the combination.

Risks are inherent in every stage of a merger process. For instance, a weak strategic rationale at the pre-deal stage may lead to a subsequent failure in the company's bid to increase its market share. By adopting the risk management approach, inefficiencies can be identified, assessed and steps can be taken to reduce their adverse affect.

For a merger to be viable, the risk-adjusted net present value of its benefits must exceed the costs of implementing the deal. This refers to hurdles that companies must overcome before they can leverage synergies.

RISKS IN DIFFERENT STAGES OF M & A :

How can Companies do the risk assesment ?

The pre-deal analysis stage… ...

During this stage, the primary hurdle for the company is to find a partner that has similar objectives. The principal role for risk management is to:

- Evaluate product compatibility and the impact of the combination of all stakeholders

- Explore various problems with respect to customers and distributors that may adversely affect business or increase costs for the combined entity.

- Examine the business model from the perspective of the new entity in providing positive returns.

The due diligence stage… ….

Risk management at this stage must focus on ensuring the soundness of the deal and establishing its economic value proposition. Various stakeholder issues must also be addressed, in this stage. Both entities involved in the merger must prioritise and meet the objectives of various stakeholders. For instance, unless customers believe that the company's products, pricing, and services will be as good as or better than they were before the merger, they are likely to seek out new suppliers. Similarly, if employees are not kept posted about merger plans and potential benefits for them, the company may lose its key talent and this result in a decline in productivity levels. Shareholders who do not perceive long-term value creation in the deal may also reduce their holding in the company. To act in the best interests of all parties concerned, the management must ensure timely and regular communication with stakeholders.

The implementation stage… …

The primary focus of risk management in this phase is on maintaining and building relationships with stakeholders. Some of the main activities involved are:

- Ensuring customer satisfaction.

- Formulating a relationship building strategy within the new entity.

- Ensuring quick implementation of the integration plan and also providing for any contingencies.

- Restructuring job profiles and ensuring open channels of communication to all stakeholders.

The post merger integration stage… …

Risk management during this stage focuses mainly on leadership in the merged entity and communications to all concerned. Managers need to formulate detailed plans for maintaining business continuity and operating the company during the integration stage. In addition to business plans, the management must clearly communicate to employees any change in job profile or position and to investors the return on investment as a result of the merger.

Adopting a risk management process in mergers would increase the possibility of achieving synergies from M&A activities.

RISK MANAGEMENT FEW ISSUES :

As protection gives way to market discipline, India's financial markets are being transformed. The changes bring expanded business possibilities but also throw up new or increased risks. By improving their risk management strategies, organisations can benefit from the

opportunities while minimising the threats. The major drivers for better risk management are:

Deregulation

A market-driven environment is replacing one administered and controlled by the regulator. However, the risk management agenda of most institutions is still solely driven by compliance with regulatory requirements. Financial organisations must upgrade their risk management techniques and extend them to cover all their activities.

Volatility in Interest Rates

When interest rates were controlled by the RBI organisations never had to consider the cost of funds or the maturity pattern of their deposits and advances while prescribing interest rates. Since interest rates have now been deregulated, organizations can largely fix their own lending and deposit rates. The resulting volatility in interest rates exposes them to higher interest rate risk. Costs, yields and risks differ widely between financial organizations. They now need to urgently measure and manage interest rate risk, and institute a system of prudent asset-liability management.

Competition

Competition has increased significantly after new international entrants and private Indian banks have been allowed entry. Simultaneously, the differences between financial institutions, non banking finance companies and banks are disappearing. As margins shrink, organisations are forced to become more aggressive in defending or acquiring market share and to diversify into new products, markets and distribution channels. Each of these brings new and unfamiliar risks.

A Changing Asset Profile

In the last two years, the performance of financial organizations has deteriorated. A major cause is increased credit risk because their customers are faced with less protection, increased competition, new products and markets of their own. Non-performing assets continue to rise at financial organizations, affecting profitability. They must therefore hunt aggressively for new, profitable assets in unfamiliar areas such as project finance at banks, working capital credit at financial institutions or retail finance at both. Traditional credit evaluation processes must change to address the new risks of this shifting asset profile.

For example, organizations are aggressively entering retail credit where margins are higher than on corporate credit. Credit appraisal techniques, however, are designed for corporate credit and there are no full-fledged credit bureau in the country to provide information on credit worthiness.

Demanding Investors

Financial organizations now invite more private capital to replace dwindling government support. Lenders and investors will drive them inexorably towards transparency, increased disclosure and better risk management.

Other Reasons

Besides this due to globalization all the companies are facing challenges from international players and so all of them must implement risk management procedures in line with the international standards.

The various international credit rating agencies like the Moody's and Standard and Poor rate the countries as well as financial institutions and the same is utilized by certain international bodies to review a client for giving loans or transacting with them. So there is a trend right now evident in India is, many financial institutions are now desperate to improve their rating. As such they are now implementing these risk management measures with utmost urgency.

Having discussed the conceptual part of risk, let us know about the various types of risks in International Finance with suitable examples.

Political Risk

Political Risk is the risk that results from political changes or instability in a country. It has adverse impact on the working of foreign enterprise located in that country as well as on financial and commercial operation carried out with such a country. This kind of risk becomes more pronounced when factors of instability such as wars, riots, social and religious conflict, or nationalist movements crop up. Form an economic viewpoint, political risk refers to uncertainty over property rights.

Types of Political Risk

Political Risk threatens continuance of direct and indirect investments in the host country as well as the exports towards it as it entails the risk of nonpayment. It also results from government measures tending to limit the working and operations of foreign firms. Political Risk can broadly classified into the following three categories

1. Country Risk

This risk emanates from political, social and economic instability of a country and manifests in the form of more or less strong hostility towards foreign investments. The hostility develops during the periods of crisis. Certain governments succumbing to discontentment of the population proceed to nationalize multinational enterprises. Other, by nationalism, incorporates nationalization in their programs. Still others want to acquire a right to control in certain sectors considered to the strategic. The political risk takes several forms, such as

nationalization or expropriation without indemnity (Compensation). The major episodes in this context are nationalization in Iran (1978), Libya (1969), Algeria (1969); nationalization with indemnity, such as in Chile (1971). Above all latent nationalization in terms of compulsory local or governmental participation constitutes another variant of political risk.

2. Sector Risk

Several studies have indicated that certain sectors are prone to greater political risk than others in some countries, though general climate to foreign investment is not unfavorable. Included in this category are Petroleum, Mining, Banking and so on. For instances, petroleum sector has been nationalized in various countries such as Mexico (1938), Libya (1968), Iraq (1972), Venezuela and Kuwait (1975), Iran (1978), and Nigeria (1979). Likewise, nationalization of copper mines took place in Zaire, Zambia, and Chile and of Iron mines in Venezuela. Banking sector was nationalized in Guinea (1962), Vietnam (1975) and Iran and Nicaragua (1978).

3. Project Risk

Sometimes, neither a country nor a sector may be a matter of risk; only a project is subject to risk. Often, multinationals take up big projects in foreign countries, like electricity generating plants, dams, exploration of petroleum fields *etc.* A project requires a huge expenditure and risk is very high in the beginning. In the event of the project turning to be successful (for example finding an exploitable petroleum field), some governments are very demanding, and in certain situations, in particular, whith the change of government the latter may even refuse to respect the engagement of the predecessor. In a recent case (1995), a new Government of the Maharashtra State in India refused to fulfill the agreement of the previous government for a large electricity project.

In respect of risk management, project participants need to be convinced that risk management activity will help them meet their own objectives. For powerful customers, a requirement that all tenders include a risk management plan is sufficient inducement for offering contractors to comply at some level. However, enlightened customers expecting risk management from contractors will take pains to demonstrate how contractors can benefit directly by improved cost estimation, greater efficiency, improved project control, and, ultimately, higher profitability.

8.3 Derivatives

This Section includes :

- Forward
- Future
- Option
- Swap

INTRODUCTION :

A typical financial transaction is marked by several risks. Derivatives allow us to manage these risks more efficiently by unbundling these risks and allowing either hedging or taking only one risk at a time. And therefore derivatives have become increasingly important in the field of finance.

Derivatives permit the separation of price risks and redistribution to others who can manage them. Derivatives traded on organized exchanges provide liquidity and quick adaptability of exposure to market changes.

Derivatives can be used for hedging, protecting against financial risk, or can be used to speculate on the movement of commodity or security prices, interest rates or the levels of financial indices.

Derivatives may be of the following forms:

 (a) **Forward,**

 (b) **Future,**

 (c) **Option,** and

 (d) **Swap.**

Options and futures are traded actively on many exchanges. Forward contract, swaps and different types of options are regularly traded outside exchanges by financial institutions, banks and their corporate clients in what are termed as over-the-counter markets—in other words, there is no single market place or an organized exchange. Derivatives are available on many aggregate economic risk factors such as global bond and stock portfolios. With many futures contracts, global risk positions and portfolios can be traded as a single financial product.

While, for example, it is difficult to trade baskets of securities at stock exchanges, stock index options and futures offer opportunities to trade aggregate stock market risks for as much as 1/10 or 1/20 of the costs of an equivalent cash market transaction! Derivatives also facilitate diversification because; given that the investment represents only a fraction of the cash instrument (leverage) it is easier to diversify a given amount of capital across several assets. Finally, if more risks can be diversified, the systematic risk exposure of the economy decreases which lowers the overall cost of risk capital for firms.

FORWARD TRANSACTIONS :

A forward contract is an agreement between two persons for the purchase and sale of a commodity or financial asset at a specified price to be delivered at a specified future date.

An agreement to purchase one currency and sell another for some date beyond two business days. A forward involves no fee, and no cash changes hands until the settlement date of the forward. A forward allows one to lock in an exchange rate today for a future payment or receipt, thereby eliminating rate risk.

Forward contracts are tailor made to the needs of the parties who may be banks in case of financial assets and trader or processor in case of commodities. Forward markets have flourished as a means to reduce price uncertainty.

The advantages of forward contract :

The benefits of forward contract are:

- It can be used to hedge or protect oneself form the price fluctuations on the future commitment date to extent of 100%

- The up front fees or margins are not applicable to forward contracts and hence no initial costs.

Disadvantages :

Forward contracts are not performance guaranteed. Hence involve counter party risk.

- The investor cannot derive any gain from favourable price movements either before or on delivery date.
- Forward contracts are not traded in the secondary market, hence there is no ready liquidity.
- Banks being one of the counter parties enter into reverse transactions to square positions and hence charge huge bid-ask spread.

A forward contract locks one investor to a particular exchange rate, thereby insulating the him or her from exchange rate fluctuations. In India, the forward contract has been the most popular instrument employed by corporate to cover their exposures, and, thereby, offset a known future cash outflow. Forward contracts are usually available only for periods up to 12 months. Forward premiums are governed purely by demand and supply, which provide corporate with arbitrage opportunities. The premiums in this market are quoted till the last working day of the month.

Internationally, the forward premiums, or discounts, reflect the prevailing interest rate differentials. Arbitrage opportunities are, therefore, limited. As a rule, a currency with a higher interest rate trades at a discount to a currency with a lower interest rate. Since there is a forward market available for longer periods, the forward cover for foreign exchange exposures can stretch up to five years. The premiums, or discounts, are quoted on a month-to-month basis. That is, from the spot date to exactly one month, or two months, or even a year.

Forward-to-forward contracts

A forward-to-forward contract is a swap transaction that involves the simultaneous sale and purchase of one currency for another, where both transactions are forward contracts. It allows the company to take advantage of the forward premium without locking on to the spot rate. The spot rate has to be locked onto before the starting date of the forward-to-forward contract.

A forward-to-forward contract is a perfect tool for corporate houses that want to take advantage of the opposite movements in the spot and forward market by locking in the forward premium at a high or low level now. CFO's can defer locking on the spot rate to the future when they consider the spot rate to be moving in their favour. However, a forward to forward contract can have serious cash flows implications for a corporate. Before booking a forward-to-forward contract, CFO should carefully examine his cash flow position bearing in mind the immediate loss that he would make if the spot rate did not move in his favour.

Example

An exporter believes that forward premiums are high, and will move down before the end of, say, December 2000. Also he expects the spot rate to depreciate. Then the optimal strategy would be to lock in the high premium now, and defer the spot rate to a future date. So he opts for a forward-to-forward contract for end-December, 2000, to end-March, 2001, paying a premium of say, Rs.0.64. By entering into such a contract, the exporter has the opportunity to lock on the spot rate anytime till December 31, 2000. Alternatively, if the three-month premium between end-December and end-March moves below the Rs.0.64 level, he can cancel the contract and book his profits.

Range-forwards

A range-forward involves the simultaneous purchase and sale of an option at different strike prices, but having the same maturity date and the same principal amount.

While an option provides a corporate the flexibility to benefit from upside movements while limiting downside risks, it has an associated cost; a high upfront premium. By setting a ceiling on the potential gains, a range-forward trades off some of the upside for a lower premium.

Example

Company X is importing machinery worth DM 1 million. Although the Chief Finance Officer (CFO) wants to insure against downside losses, he finds the option premiums are exorbitant. In exchange for a lower premium, say 0.5%, he is willing to give up some of the upside gains if the DM moves above 1.7600. So, he buys a range-forward, which limits the fluctuation of the DM to a band between 1.7600 and 1.7200.

The regulation

In September, 1996, the RBI's exchange Control Manual was amended to allow the banks to offer range-forwards to corporate to hedge their foreign exchange exposures, provided the net premium paid by the corporate was non-negative. This implies that a corporate cannot buy a range-forward which would result in a cash inflow by way of premium. The best that a corporate can do in such a situation is to opt for a zero-cost range-forward.

Ratio range-forwards

A ratio range-forward is an improved version of the basic range forward. The difference is that the principal amounts on the two options differ. The buyer gets full protection on the downside but shares the profit with the writer in a predetermined ratio if the currency moves above a specified level.

In the case of a range-forward, the buyer sacrifices the benefit of favourable movements in the currency beyond a predetermined level for a lower premium. However, with the ratio range-forward, the buyer shares the profit in a predetermined ratio if the currency moves above a predetermined ceiling. As this is an additional benefit, the ratio range-forward is more expensive.

If we consider the case of a CFO who would like to restrict his downside to DM 1.7200 to the dollar, however, he does not want to rule out the possibility of a strong dollar appreciation. The ideal instrument would b a ratio range-forward, which allows the CFO to have a specified share—say, 30% —in the gains if the DM crosses the 1.7600-mark. The Regulation: These derivative products can be freely booked and cancelled. However, the restriction barring the net inflows of premium to corporate still applies.

Terms and conditions applicable to forward contracts in India

In March, 1992, in order to provide operational freedom to corporate, the unrestricted booking and cancellation of forward contracts for all genuine exposures whether trade related or not, was permitted.

In February 1992, corporate with cross currency exposures were permitted to split their cover through the dollar. For instance if an importer with a DM 1-million payment to make on March 31st 1998, is of the view that the rupee will depreciate against the dollar, but that the dollar will appreciate against the deutsche mark, he can split his exposure into a $-DM leg and a $-Re leg-and hedge the latter. The Reserve Bank of India (RBI) has also permitted corporate to take cover in a currency of their choice irrespective of the currency receivable or payable.

In January 1997, the RBI allowed the banks to quote rupee forward premiums for more than six months. This has resulted in the development of a local forward market for up to 1-year. However, as the link between the local money market and the foreign exchange markets is not strong, and as demand and supply determine prices, activity in the long-term forward market has been limited.

In short the salient features of regulations may be enumerated as :

1. They are available for exposures arising out of genuine export / import transactions
2. They can be entered between authorized dealers and any entity which is a resident of India, at the time of the contract.
3. The authorized dealer must ensure that the investor is exposed to exchange rate risk.
4. They must be in writing, in a prescribed form.
5. The exchange broker cannot act as an authorized dealer.
6. Maximum tenure of forward contract is 6 months and can be extended to another 6 months if the need arises.

7. Forward cover in respect of one commercial transaction cannot be extended to any other foreign exchange commitment or risk.

8. Forward contracts can be cancelled for a fee.

FUTURES CONTRACT :

A futures contract is an agreement between a seller and a buyer which requires the seller to deliver to the buyer a specified quantity of security, commodity or foreign exchange at a fixed time in future at a price agreed to at the time of entering the contract. Futures contracts are traded in designed futures market unlike forward contracts that are executed over the counter. The terms of the future contracts are standardized to reduce the transaction cost to the bare minimum.

The oldest futures exchange is the Chicago Board of Trade in USA. The CBOT was limited to agricultural futures for the last 100 years. With the increased volatility in the financial markets, CBOT, along with other futures exchanges has started creating markets in financial futures.

Why futures?

Futures contracts are bought and sold for many reasons. Individuals deal in futures contracts to speculate about the future price of the asset or commodity underlying the futures contract. Corporates enter into futures contract to eliminate the risk exposure occurring due to changes in the price of the commodity. Fund managers use futures as a more economical way of achieving heir portfolio goals.

Speculators deal in futures contracts to benefit from the rice fluctuations in the underlying asset or commodity, while hedgers seek to protect themselves against price changes in commodities in which they have an interest.

Characteristics of futures

- **Organized exchanges :** Futures contracts are traded in organized exchanges with a designated physical location for futures trading. This provides instant liquidity as futures contracts can be sold and bought anytime like in a stock market.

- **Standardization :** The futures contracts are standardized in the sense that the price, the quantity and the date of maturity is fixed by the exchange in which they are traded.

- **Clearinghouse :** The clearinghouse acts as a middleman between the contracting parties. As soon as the deal is struck between X and Y, two contracts are entered into, one between X and the Clearinghouse and the other between Y and the Clearinghouse. The clearinghouse acts as a buyer for every seller and seller for every buyer. It guarantees the performance of the contracts.

- **Margins :** Only members of the respective exchanges can enter into futures contracts. They are required to deposit margin money with the clearinghouse. The amount of this margin money is generally between 2.5% to 10% of the value of the contract, but can vary.

- **Marking to market :** At the end of each trading session, all outstanding contracts are appraised at the settlement price of that trading session. This is known as Marking to market. This would mean that some participants would make a loss while others would stand to gain. The exchange adjusts this by debiting the margin accounts of those

members who made a loss and crediting the accounts of those members who have gained.

- **Actual delivery is rare :** In most futures markets, actual delivery takes place in less than one percent of the contracts traded. Futures are used as a device to hedge against price risk and as a way of betting against price movements rather than a means of physical acquisition of the underlying asset. To achieve this, most of the contracts entered into are nullified by a matching contract in the opposite direction before the maturity of the first.

Example : A fast food seller like Monginis will need to buy additional wheat from his supplier in three months. However, he feels that the price of wheat is going to increase by the time he needs the wheat in three months. May be he feels this year the monsoon will not set in on time. Because of fierce competition, he needs to hold his price constant. He wants to make sure that he pays Rs. 355 per quintal. Therefore, to lock in the Rs. 355 per quintal price, he buys a contract for three months out at Rs. 355 per quintal. If three months later the price of wheat has risen to Rs. 369 per quintal, he will pay his supplier Rs. 369. However, the Rs. 14 increase has been offset by the Rs. 14 increase in his futures contract.

On the other hand, if the price of wheat declines by an amount of Rs.10 per quintal to Rs. 345 per quintal, the decline in the futures contract will be offset by the lesser amount the manufacturer has to pay his supplier. Irrespective of what happens in the spot market, the manufacturer has locked in a set price for the wheat he needs to purchase in the future.

Types of Futures

Futures may be broadly classified into **Commodity** and **Financial Futures.** A commodity is a futures contract in a commodity like tea, coffee, cocoa, aluminium *etc.* A financial future is a futures contract in a financial instrument like Treasury bill, currency or stock index.

1. **Commodity futures**

   - **Agricultural :** This includes tea, coffee, wheat, spices, rice, sugar *etc.* For each of these commodities there are different contract months available. Contract months generally revolve around the harvest cycle. More actively traded commodities usually have more contract months available.

   - **Metallurgical :** The group of metallurgical commodities includes the metals and the petroleum. The metals group includes gold, silver, copper, palladium and propane. Different contract months, grades, amounts, and types of these contracts are available.

2. **Financial futures**

   - **Interest Bearing Assets :** This group of futures contracts includes Treasury Bills, Treasury Bonds, Treasury Notes, Municipal Bonds, and Eurodollar Deposits. The entire yield curve is represented and it is possible to trade these instruments with tremendous flexibility as to maturity. In fact, it is also possible to trade contracts with the same maturity but different expected interest rate differentials. In addition, foreign exchanges also trade debt instruments.

   - **Indexes :** Today, there are futures on most major indexes. The National Stock Exchange, BSE Sensex (of Mumbai Stock Exchange) of India, S&P 500, New York Stock Exchange Composite, New York Stock Exchange Utilities Index, Commodities

Research Bureau (CRB), Russell 2000, S&P 400 Midcap, Value Line, and the FT-Se 100 Index (London), Stock index futures are settled in cash. There is no actual delivery of a good. The only possibility for the trader to settle his positions is to buy or sell an offsetting position or in cash at expiration. Recently the National Stock Exchange has launched derivative futures called S&P CNX Nifty.

An Index future is a future where the underlying asset is a stock index. The NSE stock index (CNX Nifty) has been launched on 12th June 2000. It has been observed that investors like to hedge their entire share portfolio and not just one or two stocks. A portfolio of 10 to 15 stocks tends to have a strong correlation with the indices. Index futures may be

- Value weighted index (consists of each stock of the index value in proportion to the market value of the outstanding shares) Ex: S&P 500, NYSE.

- Price weighted index (is the one that gives a weight to each stock that is proportional to its stock price) Ex: NIKKEI

In value-weighted index, all blue chips with heavy market capitalization have more weightage whereas in price-weighted index, small equity company can also have major weights based on its price.

Trading and Settlement

Index futures are also standardized like all futures. The size and the tenure need to be understood. The size represents the minimum quantity of the index that is bought or sold; trading lots are in multiples of this number. The tenure is the minimum duration for which a futures contract can remain open. At the end of the period both the parties to the contract necessarily settle. Settlement is in cash and obviously the seller of the index future does not deliver the underlying securities of an index.

Index Futures and SEBI

SEBI has specified the minimum size of 2 lakh and a maximum tenure of three months. Given the current Nifty and Sensex levels, futures contracts based on these will have a minimum market lot of 150 and 50.

Advantage

Index futures help an investor to take a position on the market and also hedge the share portfolio against adverse market conditions. One can get out of the futures position anytime before the contract expires by entering into a reverse contract.

How does it work?

An Index future is essentially a forward contract and hence requires payment of an initial amount called up front or initial margin of the value of the contract ranging from 6 to 10 percent. They are marked to market daily *i.e.* profits and losses are received and paid out by the contracting parties every day.

For example, if an investor is optimistic that the Nifty would rise in future and buys, say 100 Nifty futures paying an initial margin of say, 8%. At the time he sells, he gains if the Nifty rises. The profit being the difference between the selling price and the buying price (margin) multiplied by the number of futures purchased.

Foreign Currencies : In the 1970s when freely floating exchange rates were established it became possible to trade foreign currencies. Most major foreign currencies are traded. The principal currencies traded are the Canadian dollar, Japanese yen, British pound, Swiss franc, French franc, Eurodollar, Euromark, and the Deutsch mark. The forward market in currencies is much larger than the foreign exchange futures market. Additionally, there are now cross currency futures those trades. Examples of these are the Deutsch mark / French franc and the Deutsch mark / yen. Almost every month a new type of contract appears to meet the needs of a continuously growing corporate and institutional market.

Forwards vs. Futures

S. No.	Difference	Forwards	Futures
1.	Size of contract	Decided between buyer & seller	Standardized in each futures market
2.	Price of contract	Remain fixed till maturity	Changes everyday
3.	Market to market	Not done	Market to market everyday
4.	Margin	No margin required	Margins are to be paid by both buyers & sellers
5.	Counter party risk	Present	Not present
6.	No. of contracts in a year	There can be no. of contracts	No. of contracts in a year are fixed.
7.	Hedging	These are tailor-made for specific date and quantity and hence are perfect	Hedging is by nearest month or quarter (if there are 4 contracts) and quantity contracts, so it is not perfect
8.	Liquidity	No liquidity, as they are not traded on secondary market	Highly liquid
9.	Nature of market	Over the counter	Exchange traded
10.	Mode of delivery	Specifically decided. Most of the contracts result in delivery	Standardized. Most of he contracts are cash settled

OPTION :

An option is a contract in which the seller (writer) of the option grants the buyer of the option the right to purchase from or sell to the writer a designated instrument for a specified price within a specified period of time.

Unlike a foreign exchange forward, the option does not obligate the buyer to deliver currency on the settlement date. Foreign exchange options are ideal for hedging exposures in which the amount or the timing of exposure are uncertain. Foreign exchange options allow you to protect against unfavourable currency moves while retaining the ability to participate in favourable moves.

In other words, an option is a contract that gives the holder the right, but the not the obligation, to buy (call) or sell (put) a specified underlying instrument at a fixed price before, or at, a future date. The option holder has to compensate the writer (the issuer of the instrument) for this right, and the cost borne is called the premium or the option price.

The premium should be adequate for the risk borne by the writer and yet, from the holder's point of view, must be worth paying. If the option contains provision to the effect that it can be exercised any time before the expiry of the contract, it is termed as an American Contract. If it can be exercised only on the expiry date, it is termed as European Contract.

Options contract gives the holder a right but not the obligation to buy or sell an underlying asset at a specified date in the future at a certain price. The specified date is called the expiration date. For, the contract expires on that date if the option-holder chooses not to exercise his right to buy or sell the asset. The price at which the option-holder can buy or sell the underlying asset is called the "Strike price."

When the contract gives the holder a right to buy an asset, it is termed as "Call option". On the other hand, an option that gives the right to sell an asset is called as "Put option".

Options are available on a large variety of underlying assets like common stock, currencies, debt instruments and commodities. Also traded are options on stock indices and futures contracts where the underlying asset is a futures contract on stock index with options combined.

Options have proved to be versatile and flexible tools for risk management by themselves as well as in combination with other instruments. Options also provide a way for individual investors with limited capital to speculate on the movements of stock prices, exchange rate, commodity prices *etc.* The biggest advantage in this context is the limited loss feature of options.

Let us consider a typical options contract. Suppose person buy call options on Reliance Industries Limited (RIL) at strike price of Rs. 375, expiring December. This gives one the right but not the obligation to buy RIL shares in December at a price of Rs. 375. Naturally, one would not exercise the option unless RIL's price in December is more than the strike price. Suppose RIL then trades at Rs. 400. The option is said to have an intrinsic value of Rs.25 that is the difference between the strike price and the market price.

Such options are said to be in-the-money as they help one to pocket gains. When the strike price is higher than the market price, the option is said to be out-of-the-money.

What are the advantages of an options contract?

Suppose somebody wants to buy RIL in December but wish to know his or her outflow now. Entering into a contract now to buy RIL at, say, Rs.425 in December is one way of locking into the outflow.

That would however, put him or her at a loss if the market price then falls below Rs.425. This is where an options contract helps. One would buy only if the strike price is lower than the market price.

Types of Options

- **Currency call option :** grants its owner the right but not the obligation to buy a specific currency at a specific price (exercise price or strike price) within a specified period of time.

- **Currency put option :** grants its owner the right and not the obligation to sell a specific currency at a specified price (the strike price) within a specified period of time.

- **Stock option :** an option on a stock is called stock option.

- **Bond option :** an option on a bond is called bond option.

- **Stock index option :** this involves buying units of index, which represents the whole market in the same proportion in which individual stocks are represented in the market.

- **Multi-currency option :** it is an arrangement whereby a borrower gets an option to draw funds in one or more of the specified currencies and switch over loans from one currency to another.

- **American option :** can be exercised anytime during the option period.

- **European option :** can be exercised only on the expiry or maturity date.

Options can be used for hedging currency exposures when a corporate is not sure which way the currency is going to move. By entering into an option contract, the investor gets the best of both worlds his downside is restricted to the premium that he pays, and he enjoys an unlimited upside. For the buyer of an option, the gains are unlimited and the losses are limited. For the writer of an option the losses are unlimited and the gains are limited to the extent of the premium he gains.

Currency Option and Two of its Components

- **The intrinsic value :** The amount by which an option is in the money. A call option whose exercise price is below the current spot price of the underlying instrument, or a put option whose exercise price is above the current spot price of the underlying instrument, is said to be in the money.

- • **The extrinsic value :** It is the total premium of an option less the intrinsic value. It is also known as the time value or volatility value. As the expiry time increases, the premium of an option also increases. However, with each passing day, the rate of increase in the premium decreases. Conversely, as an option approaches expiry, the rate of decline in its intrinsic value increases. This decline is known as the time decay. Therefore, the more volatile a currency, the higher will be its option value.

Example

Company X is importing machinery for DM 1 million. At the time the deal was struck, the DM was trading at 1.7600 to the dollar. Payment has to be made by April 30, 1998. The DM has already depreciated to 1.7700, and the company has made a tidy profit. The CFO believes that the dollar will continue to gain against the DM, but he would not like to loose the gains he already made. Therefore, he buys an in-the-money DM call option, by paying an up front premium of 2.01 percent. If on April 30, 1998, the DM is above 1.7900, he will let the option lapse; on the other hand, if the DM is 1.7200, he would exercise the option, and buy DM at the predetermined rate of 1.7600.

In January, 1994, corporate houses were permitted to use currency options as a hedging product. In the absence of a rupee-yield curve a rupee-based currency options were not permitted since the pricing of such options would have been arbitrary. Therefore, the banks were allowed to offer only cross-currency options on a fully-covered basis. And the option could be cancelled only once; Chief Finance Officers (CFOs) were not permitted to re-book options against the same exposure. They could, however, hedge the exposure using the forward market. In September, 1996, corporate houses were allowed to freely book and cancel options. But rupee-based options are still not permitted by the RBI.

Fixed Rate Debt and Embedded Options

Fixed rate debt typically includes either a prepayment option or, in the case of publicly traded debt, a call provision. In substance this right is no more and no less than a put option on interest rates and a right which becomes more valuable the further interest rates fall. By way of contrast, swap agreements do not contain a prepayment option. The early termination of a swap contract will involve the payment, in some form or other, of the value of the remaining contract period to maturity.

SWAPS :

Swap in finance means an exchange of one obligation with another. Financial swaps are a funding technique, which permit a borrower to access one market or instrument and exchange the liability for another market or instrument. Investors can exchange one type of risk with another.

It is a device for obtaining the desired form of financing indirectly which otherwise might be inaccessible or too expensive. Swaps allow the borrowers to raise money in one market and

to swap one interest rate structure for another (from fixed to floating), or swap principal and interest from one currency to another.

Why swaps?

Swaps are increasingly becoming popular for the following reasons:

- Difference in borrowers and investors preferences and market access;

- A low cost device to achieve certain objectives, which can be achieved by other means but at a higher cost;

- Market saturation *i.e.* lack of availability of the desired currency due to saturation; and

- Differences in financial norms followed by different countries.

Financial Benefits Created by Swap Transactions

Consider the following statements:

1. A company with the highest credit rating, AAA, will pay less to raise funds under identical terms and conditions than a less creditworthy company with a lower rating, say, BBB. The incremental borrowing premium paid by a BBB company, which it will be convenient to refer to as a "Credit quality spread", is greater in relation to fixed interest rate borrowings than it is for floating rate borrowings and this spread increases with maturity.

2. The counterparty making fixed rate payments in a swap is predominantly the less creditworthy participant.

3. Companies have been able to lower their nominal funding costs by using swaps in conjunction with credit quality spreads.

These statements are fully consistent with the objective data provided by swap transactions and they help to explain the "Too good to be true" feeling that is sometimes expressed regarding swaps. Can it really be true, outside of "Alice in Wonderland", that everyone can be a winner and that no one is a loser? If so, why does this happy state of affairs exist? The answer follows:

(a) The Theory of Comparative Advantage

When we begin to seek an answer to the questions raised above, the response we are most likely to meet from both market participants and commentators alike is that each of the counterparties in a swap has a "Comparative advantage" in a particular and different credit market and that an advantage in one market is used to obtain an equivalent advantage in a different market to which access was otherwise denied. The AAA Company therefore raises

funds in the floating rate market where it has an advantage, an advantage which is also possessed by company BBB in the fixed rate market.

The mechanism of an interest rate swap allows each company to exploit their privileged access to one market in order to produce interest rate savings in a different market. This argument is an attractive one because of its relative simplicity and because it is fully consistent with data provided by the swap market itself. However, as Clifford Smith, Charles Smithson and Sykes Wilford point out in their book *Managing Financial Risk,* it ignores the fact that the concept of comparative advantage is used in international trade theory, the discipline from which it is derived, to explain why a natural or other immobile benefit is a stimulus to international trade flows. As the authors point out: The United States has a comparative advantage in wheat because the United States has wheat producing acreage not available in Japan. If land could be moved—if land in Kansas could be relocated outside Tokyo—the comparative advantage would disappear. The international capital markets are, however, fully mobile. In the absence of barriers to capital flows, arbitrage will eliminate any comparative advantage that exists within such markets and this rationale for the creation of the swap transactions would be eliminated over time leading to the disappearance of the swap as a financial instrument. This conclusion clearly conflicts with the continued and expanding existence of the swap market.

(b) Information asymmetries

The much-vaunted economic efficiency of the capital markets may nevertheless co-exist with certain information asymmetries. Four authors from a major US money center bank have argued that a company will—and should—choose to issue short term floating rate debt and swap this debt into fixed rate funding as compared with its other financing options if:

1. It had information——not available to the market generally——which would suggest that its own credit quality spread (the difference, you will recall, between the cost of fixed and floating rate debt) would be lower in the future than the market expectation.

2. It anticipates higher risk-free interest rates in the future than does the market short and is more sensitive (*i.e.* averse) to such changes than the market generally.

In this situation a company is able to exploit its information asymmetry by issuing short term floating rate debt and to protect itself against future interest rate risk by swapping such floating rate debt into fixed rate debt.

Returning to our initial question as to why an interest rate swap can produce apparent financial benefits for both counterparties the true explanation is, I would suggest, a more complicated one than can be provided by the concept of comparative advantage alone.

Information asymmetries may well be a factor, together with the fact that the fixed rate payer in an interest rate swap—reflecting the fact that he has no early termination right—is not paying a premium for the implicit interest rate option embedded within a fixed rate loan that does contain a pre-payment right. This saying is divided between both counterparties to the swap.

Types of Swaps

- Interest rate swap
- Currency swap
- Cross currency swap (combination of the above two)

Interest Rate Swap

Example : Company A has borrowed $10 million of a floating interest rate of LIBOR (London Inter Bank Offer Rate) plus 2% payable and Company B has borrowed $10 million on which a fixed interest rate of 10% is payable. A and B enter into an interest rate swap transaction under which A agrees to pay B a fixed interest rate of 10% and B agrees to pay A LIBOR plus 2%.

Swaps may result in cost savings as the two parties may have different credit risks. To explain further, assume that company A has low rating and can borrow only at a fixed interest rate. On the other hand company B is rated high and can borrow at floating rate basis.

Fixed to floating rate swap is the standard interest rate swap. It is also known as vanilla swap. This refers to an agreement between two parties that contract to make payments to one another on specified dates in future till an agreed termination date in a particular way, where one party, known as the fixed rate payer makes an agreed payment. The other party known as the floating rate payer makes payments pegged to the movement of a particular interestrate index. Usually LIBOR is used as the underlying interest rate index.

There are three types of interest rate Swaps:

- **Coupon swaps:** fixed to floating rates or *vice versa.*
- **Basis swaps:** the exchange of one benchmark for another under floating rates (LIBOR for Treasury Bill rate)
- **Cross currency interest rates swap:** this swap has fixed rate flows in one currency for floating rate flows in another currency.

Interest rate swap: More Issues

An interest rate swap is a contractual agreement entered into between two counterparties under which each agrees to make periodic payment to the other for an agreed period of time based upon a notional amount of principal. The principal amount is notional because there is no need to exchange actual amount of principal in a single currency transaction: there is no foreign exchange component to be taken account of. Equally, however, a notional amount of principal is required in order to compute the actual cash amounts that will be periodically exchanged.

Under the commonest form of interest rate swap, a series of payments calculated by applying a fixed rate of interest to a notional principal amount is exchanged for a stream of payments similarly calculated but using a floating rate of interest. This is a fixed-for-floating interest

rate swap. Alternatively, both series of cash flows to be exchanged could be calculated using floating rates of interest but floating rates that are based upon different underlying indices. Examples might be LIBOR and commercial paper or Treasury bills and LIBOR and this form of interest rate swap is known as a basis or money market swap.

Pricing Interest Rate Swaps

If we consider the generic fixed-to-floating interest rate swap, the most obvious difficulty to be overcome in pricing such a swap would seem to be the fact that the future stream of floating rate payments to be made by one counterparty is unknown at the time the swap is being priced. This must be literally true: no one can know with absolute certainty what the 6 months US dollar LIBOR rate will be in 12 months time or 18 months time. However, if the capital markets do not possess an infallible crystal ball in which the precise trend of future interest rates can be observed, the markets do possess a considerable body of information about the relationship between interest rates and future periods of time.

Reversing or Terminating Interest Rate Swaps

The point has been made above that at inception the net present value of the aggregate cash flows that comprise an interest rate swap will be zero. As time passes, however, this will cease to be the case, the reason for this being that the shape of the yield curves used to price the swap initially will change over time. Assume, for example, that shortly after an interest rate swap has been completed there is an increase in forward interest rates, the forward yield curve steepens. Since the fixed rate payments due under the swap are, by definition, fixed, this change in the prevailing interest rate environment will affect future floating rate payments only; current market expectations are that the future floating rate payments due under the swap will be higher than those originally expected when the swap was priced. This benefit will accrue to the fixed rate payer under the swap and will represent a cost to the floating rate payer. If the new net cash flows due under the swap are computed and if these are discounted at the appropriate new zero coupon rate for each future period (i.e. reflecting the current zero coupon yield curve and not the original zero coupon yield curve), the positive net present value result reflects how the value of the swap to the fixed rate payer has risen from zero at inception. Correspondingly, it demonstrates how the value of the swap to the floating rate payer has declined from zero to a negative amount.

If, the floating rate payer wishes to terminate the swap with the fixed rate payer's agreement, then the positive net present value figure we have calculated represents the termination payment that will have to be paid to the fixed rate payer. Alternatively, if the floating rate payer wishes to cancel the swap by entering into a reverse swap a new counterparty for the remaining term of the original swap, the net present value figure represents the payment that the floating rate payer will have to make to the new counterparty in order for him to enter into a swap which precisely mirrors the terms and conditions of the original swap.

Credit Risk Implicit in Interest Rate Swaps

To the extent that any interest rate swap involves mutual obligations to exchange cash flows, a degree of credit risk must be implicit in the swap. Note however, that because a swap is a

notional principal contract, no credit risk arises in respect of an amount of principal advanced by a lender to a borrower which would be the case with a loan. Further, because the cash flows to be exchanged under an interest rate swap on each settlement date are typically "Netted" (or offset) what is paid or received represents simply the difference between fixed and floating rates of interest. Contrast this again with a loan where what is due is an absolute amount of interest representing either a fixed or a floating rate of interest applied to the outstanding principal balance. The periodic cash flows under a swap will, by definition, be smaller therefore than the periodic cash flows due under a comparable loan.

An interest rate swap is in essence a series of forward contracts on interest rates. In distinction to a forward contract, the periodic exchange of payment flows provided for under an interest rate swap does provide for a partial periodic settlement of the contract but it is important to appreciate that the net present value of the swap does not reduce to zero once a periodic exchange has taken place. This will not be the case because—as discussed in the context of reversing or terminating interest rate swaps—the shape of the yield curve used to price the swap initially will change over time giving the swap a positive net present value for either the fixed rate payer or the floating rate payer not withstanding that a periodic exchange of payments is being made.

Users and Uses of Interest Rate Swaps

Interest rate swaps are used by a wide range of commercial banks, investment banks, non-financial operating companies, insurance companies, mortgage companies, investment vehicles and trusts, government agencies and sovereign states for one or more of the following reasons:

1. To obtain lower cost funding
2. To hedge interest rate exposure
3. To obtain high yielding investment assets
4. To create types of investment asset not otherwise obtainable
5. To implement overall asset or liability management strategies
6. To take speculative positions in relation to future movements in interest rates.

The Advantages of Interest Rate Swaps

1. A floating –to-fixed swap increases the certainty of an issuer's future obligations
2. Swapping form fixed-to-floating rate may save the issuer money if interest rates decline.
3. Swapping allows issuers to revise their debt profile to take advantage of current or expected future market conditions.
4. Interest rates swaps are a financial tool that potentially can help issuers lower the amount of debt service.

Typical transactions would certainly include the following, although the range of possible permutations is almost endless.

(a)   Reducing funding costs. A US industrial corporation with a single A credit rating wants to raise US$ 100 million of seven year fixed rate debt that would be callable at par after three years. In order to reduce its funding cost it actually issues six month commercial paper and simultaneously enters into a seven year, non amortising swap under which it receives a six month floating rate of interest (Libor Flat) and pays a series of fixed semi-annual swap payments. The cost saving is 100 basis points.

(b)   Liability management. A company actually issues seven year fixed rate debt which is callable after three years and which carries a coupon of 7%. It enters into a fixed-to-floating interest rate swap for three years only under the terms of which is pays a floating rate of Libor + 185 bps and receives fixed rate of 7%. At the end of three years the company has flexibility of calling its fixed rate loan—in which case it will have actually borrowed on a synthetic floating rate basis for three years—or it can keep its loan obligation outstanding and pay a 7% fixed rate for further four years. As a further variation, the company's fixed-to-floating interest rate swap could be an "Arrears reset swap" in which—unlike a conventional swap—the swap rate is set at the end and not at the beginning of each period. This effectively extends the company's exposure to Libor by one additional interest period which will improve the economics of the transaction.

(c)   Speculative position.   The same company described in (b) above may be willing to take a position on short term interest rates and lower its cost of borrowing even further (provided that its judgment as to the level of future interest rates is correct). The company enters into a three year "Yield curve arbitrage swap" in which the floating rate payments it makes under the swap are calculated by reference to a formula. For each basis point that Libor rises, the company's floating rate swap payments rise by two basis points. The company's spread over Libor, however, falls from 185 bps to 144 bps. In exchange, therefore, for significantly increasing its exposure to short term rates, the company can generate powerful savings.

(d)   Hedging interest rate exposure. A financial institution providing fixed rate mortgages is exposed in a period of falling interest rates if homeowners choose to pre-pay their mortgages and re-finance at a lower rate. It protects against this risk by entering into an "Index-amortising rate swap" with, for example, a US regional bank. Under the terms of this swap the US regional bank will receive fixed rate payments of 100 bps to as much as 150 bps above the fixed rate payable under a straightforward interest swap. In exchange, the bank accepts that the notional principal amount of the swap will amortize as rates fall and that the faster rates fall, the faster the notional principal will be amortized.

A less aggressive version of the same structure is the "Indexed principal swap". Here the notional principal amount continually amortizes in line with a mortgage pre-payment index such as PSA but the amortization rate increases when interest rates fall and the rate decreases when interest rates rise.

(e)   Creation of new investment assets. A UK corporate treasurer whose company has substantial business in Spain feels that the current short term yield curves for sterling and the peseta which shows absolute interest rates converging in the two countries is exaggerated. Consequently he takes cash currently invested in the short term sterling money markets and

invests this cash in a "Different swap". A differential swap is a swap under which the UK Company will pay a floating rate of interest in sterling (6 mth. Libor) and receive, also in sterling, a stream of floating rate payments reflecting Spanish interest rates plus or minus a spread. The flows might be: UK Corporation pays six month sterling Libor flat and receives six month Peseta Mibor less 210 bps paid in sterling. Assuming a two year transaction and assuming sterling interest rates remained at their initial level of 5.25%, peseta Mibor would have to fall by 80 bps every six months in order for the treasurer to earn a lower return on his investment than would have been received from a conventional sterling money market deposit.

(f) Asset management. A German based fund manager has a view that the sterling yield curve will steepen (i.e. rates will increase) in the range two to five years during the next three years he enters into a "Yield curve swap" with a German bank whereby the fund manager pays semi-annual fixed rate payments in DM based on the two year sterling swap rate plus 50 bps. Every six months the rate is re-set to reflect the new two year sterling swap rate. He receives six months fixed rate payments calculated by reference to the five year sterling swap rate and re-priced every six months. The fund manager will profit if the yield curve steepens more than 50 bps between two and five years.

Example

Company X has obtained a loan of $20 million, with interest rates pegged to the six-month LIBOR. The CFO is of the view that interest rate in US are on the rise. To prevent a loss by way of a higher interest outflow in the coming years, he decided to enter into an interest swap with his banker. Essentially, the banker agrees to pay the corporate a six-month LIBOR rate in return for a fixed interest payment by the corporate.

The possibilities are almost endless but the aforementioned examples do give some general indication of how interest rate swaps can be and are being used.

Currency Swaps

A currency swap converts a stream of cash flow from one currency to another without exchange rate risk. Currency swaps enable a corporation to lower its borrowing costs in any desired currency. The basic principle is that a corporation should borrow in the country in which it receives the cheapest possible source of financing. A currency swap would then enable it to convert this to inexpensive financing in the desired currency.

In currency swap, both principal and interest payments in one currency are exchanged to another currency. An exchange of principal amounts in the beginning and re-exchange at termination is also possible. This may take the form of fixed to fixed, fixed to floating and floating to floating currency swaps.

- **Fixed to fixed currency swap** involves exchange of principals which are equivalent and denominated in different currencies, where both the parties make fixed payments to each other till the termination on a specified date.

- **Floating to floating swap** involves both payments at floating rate but in difference currencies.

- **Fixed to floating currency swap** is a combination of fixed to fixed and floating to floating currency swap.

Credit Derivative

Credit risk is an evitable risk faced by almost everyone entering into a loan contract. Credit risk is a risk that arises if a counter party does not honour or fails to fulfill his contractual obligation. For example, a bank giving loans to its client often fears default in its repayment.

Therefore, to minimise the impact of credit risk an innovative instrument called "Credit Derivatives" was designed. Credit derivative is an Over-the-Counter (OTC) derivative designed to transfer credit risk from one party to another. These privately negotiated bilateral contracts allow users to manage their exposure to credit risk. For example, a bank, concerned that one of its customers may not be able to repay a loan can protect itself against loss by transferring the credit risk to another party while retaining the loan on its books. This mechanism can be used for any debt instrument or basket of debt instruments.

Types of Credit Derivatives

Four major types of derivative instruments contribute maximum volume in OTC exchanges. These are explained below:

Credit Default Swaps

Two parties enter into an agreement, whereby one party pays the other a fixed periodic coupon for the specified life of the agreement. The other party makes no payment unless a specified credit event occurs. Credit events are typically defined to include a material default, bankruptcy or debt restructuring for a specified reference asset. If such a credit event occurs, he makes a payment to the first party, and terminates the swap. The size of the payment is usually linked to the decline in the reference asset's market value following the credit event.

Future of Credit Derivative

Credit derivatives have radically altered the credit market. The range of positions, include long, flat, short, asymmetric and option-like. Credit derivatives have unlocked market.

The interest rate swap market is likely to make rapid strides. This in turn, is likely to affect the credit derivative business as banks develop tools to manage credit using the portfolio theory. Quite similar to the upsurges in the interest rate swap market which banks developed good asset / liability management models. Most importantly, capital regulations will reflect the shift from large, illiquid, long-maturity credit exposures to liquid risks and basis risk.

MANAGING INTEREST RATE : MORE TO LEARN :

Forward Rate Agreements

A Forward Rate Agreement (FRA) is an agreement between two parties who wish to protect themselves against fluctuations in interest rates. The parties agree on an interest rate for a specific period of time on a specified principal amount.

The Instrument : FRAs are an effective instrument for companies which have borrowed at floating rates of interest, and wish to hedge their interest rate risks. The buyer of an FRA is a party wishing to protect itself against a rise in the interest rates, and the seller is a party insuring itself against a decline.

The price of an FRA will depend on the slope of the yield curve — which essentially reflects interest rate expectations. Earlier the FRA was linked to dollar-linked borrowings since the dollar was perceived to be more volatile than the European currencies. However, FRAs now cover a wide selection of currencies and maturities. In an environment of increasing interest rate volatility, a FRA helps a corporate crystallize its interest costs.

The banks can offer FRAs linked to the LIBOR. Again, they have to ensure that such agreements are used purely as a liability management tool.

Example

Company X is raising a dollar loan, with the effective annual rate at the London Inter-Bank Offered Rate (LIBOR) plus 100 basic points. Installments are payable every six months. The CFO believes that the interest rates in the US will rise in the near future by at least 0.25%. The payments are due in end-September, 1997 and end-March, 1998. Since this is a floating interest loan, the LIBOR for interest payments is crystallized six months in advance. While the LIBOR in August 1, 1997 was 5.70%, the corporate enters into an FRA for two against eight months to protect its interest liability in March, 1998, the LIBOR for which will be fixed in end-September, 1997. The "2s vs. 8s" FRA costs 5.77%. If no interest rate hike takes place, the LIBOR will be applied (5.70%) and the corporate will pay the difference of 0.07% to the FRA-seller as the FRA is independent of the loan agreement. In case the hike happens as expected, and interest rate rise to 5.95%, the corporate will receive 0.18% (5.95 – 5.77) from the seller, and interest on the installment will be calculated at 5.95%.

What is an Interest Rate Swap ?

An interest rate 'swap' is an exchange of interest payments between two parties. In the above example it means that fixed rate payments and floating rate payments are exchanged at periodic intervals based on an underlying notional principal amount by the counterparties. This is an Interest Rate Swap. Thus Interest rate swaps are generally used for 'swapping' from a floating rate of interest into a fixed rate of interest, or vice-versa.

Interest rate swaps are used to hedge interest rate risks as well as to take on interest rate risks. If a treasurer is of the view that interest rates will be falling in the future, he may convert his fixed interest liability into floating interest liability; [Take a home loan borrower who 2 years ago, took a fixed rate home loan from ICICI bank]; and also his floating rate assets into fixed rate assets. If he expects the interest rates to go up in the future, he may do vice versa [As it is now when many home loan borrowers chose to convert floating rate home loans to fixed rate loans]. Since there are no movements of principal, these are off balance sheet instruments and the capital requirements on these instruments are minimal. Please note that individual borrowers do not perform swap though they may face similar situations with their borrowings.

Definition : A contract which involves two counter parties to exchange over an agreed period, two streams of interest payments, each based on a different kind of interest rate, for a particular notional amount.

Mechanism of an Interest Rate Swap

Take the case of an interest rate swap, in which Counter Party A and Counter Party B agree to exchange over a period of say, five years, two streams of semi-annual payments. The payments made by A are calculated at a fixed rate of 6% (Fixed rate) per annum while the payments to be made by B are to be calculated using periodic fixings of 6-month Libor (floating). The swap is for a notional principal amount of USD 10 million. The above swap is called the "plain vanilla" or the "coupon swap". Interest rates are normally fixed at the beginning of the contract period, but settled at the end of the period.

The contract can be simplified as follows.

Counter parties :: A and B

Maturity :: 5 years

A pays to B : 6% fixed p.a.

B pays to A : 6-month LIBOR

Payment terms : semi-annual

Notional Principal amount: USD 10 million.

Diagram :
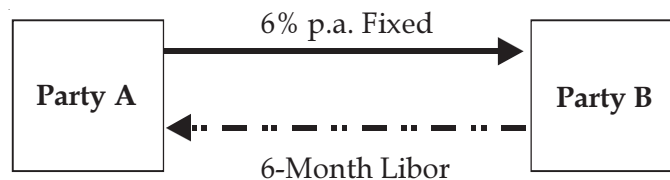
Cash flows in the above swap are represented as follows :

Period	Fixed Payments	Floating Payments	Net Cash from A to B	LIBOR Rate
1	300000	337500	-37500	6.75
2	300000	337500	-37500	6.75
3	300000	337500	-37500	6.75
4	300000	325000	-25000	6.50
5	300000	325000	-25000	6.50
6	300000	325000	-25000	6.50
7	300000	312500	-12500	6.25
8	300000	312500	-12500	6.25
9	300000	312500	-12500	6.25
10	300000	325000	-25000	6.50
		-250000		

Typical Characteristics of the Interest Rate Swaps :

The principal amount is only notional.

Opposing payments through the swap are normally netted.

The frequency of payment reflects the tenor of the floating rate index.

Interest Rate Swap with Bank as an intermediary

The following diagram illustrates the case in which an intermediary, e.g. a bank, is involved in a swap deal between two counter parties. Borrower A has a floating rate loan, but would prefer a fixed rate loan. There is another borrower B who has a fixed rate loan, but would prefer a floating rate loan. The intermediary can now match these two borrowers as described in the following diagram.

Diagram :
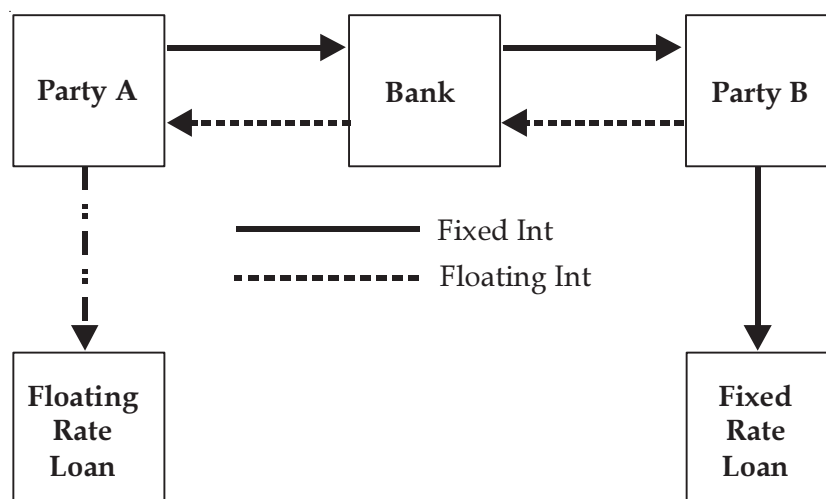
Example

Consider two companies, rated AAA and BBB. AAA has a higher credit rating than BBB. Both companies can raise funds either by issuing fixed-interest bonds or by taking bank loans (at a floating interest rate). Their borrowing costs are :

		Cost of Funds to AAA and BBB	
	Objective	Fixed rate bonds	Floating rate loans
AAA	Floating	10.00% p.a.	Libor+ 1 OObp
BBB	Fixed	12.00% pa	Libor + 160bp
Differential		**200 bps**	**60bps**

Assume now that AAA wants to raise floating rate money and BBB wants to raise fixed rate money. It will be realized that the advantage (200 basis points) of AAA raising fixed rate money in the bond market as against BBB, and an advantage (60 basis points) of AAA raising

floating rate money in the bond market as against BBB, can be exploited by both parties if they meet. The key to an interest-rate swap is the QSD (Quality Spread Differential), the difference or spread between fixed interest rates, and floating interest rate. There is a comparative advantage Le. QSD of 140(200-60) basis points. Both the parties can share the difference and reduce their borrowing costs. A Banker normally acts as an intermediary and arranges most of these deals. A share of the advantage is passed on to the banker. In this case, if the three parties agree to share the difference as 80:40:20 basis points, then we examine as follows :

Firm	Paid to Bank	Received from Bank	Paid to market	Net Cost	Savings
AAA	Libor	9.8%	10%	Libor + 20bp	(Libor +100bp) – (Libor + 20bp) = 80bp
BBB	10%	Libor	Libor + 160bp	11.6%	(12-11.6) = 40bp

The following diagram illustrates the transaction.
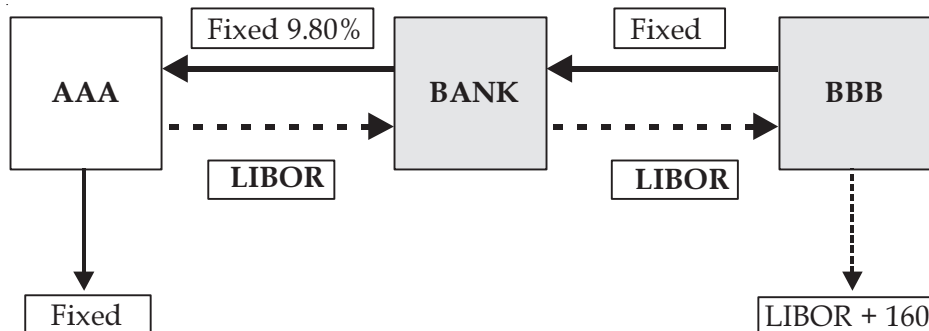
Uses of Interest Rate Swap

Interest Rate swaps without offsetting underlying create interest rate risk. : Each counter party in an interest rate swap is committed to pay a stream of interest payments and receive a different stream of interest payments. A payer of fixed interest rate payments is exposed to the risk of falling interest rates, while a payer of floating interest rate payments is exposed to the risk of rising interest rates. Similarly, a receiver of fixed interest rate payments is exposed to the risk of rising interest rates while the receiver of floating interest payments is exposed to the risk of falling interest rates. To summarize, interest rate swaps create an exposure to interest rate movements, if not offset by an underlying exposure.

Interest rate swaps can be used to hedge interest rate risk

Floating rate loans expose the debtor to the risk of increasing rates. To (avoid this risk, he may like to go for a fixed rate loan, but due to the market conditions and his credit rating, his fixed rate loans are available only at a very high cost. In that case, he can go for a floating rate liability and then swap the floating rate liability into a fixed rate liability. He can do the

swap with another'counter party whose requirements are the exact opposite of his or, as is more often the case, can do the swap with a bank.

Example

A manufacturing company embarks on a project for which it borrows USD 4 million working capital on a floating interest rate basis, payable quarterly for"two years. Since the treasurer of the company felt that the floating rate payments will involve serious risks, he decides to enter into a swap with a bank and convert the same into a fixed rate loan. The bank now swaps the floating rate payments into a fixed rate at 12%. The resultant cash flow arising out of the transaction is illustrated below.

Quarter	Floating rate	Floating rate payments	Fixed rate payments	Net cash paid by Co.
1	12.25	122500	120000	-2500
2	12.25	122500	120000	-2500
3	12.25	122500	120000	-2500
4	12	120000	120000	0
5	12	120000	120000'	0
6	12	120000	120000	0
7	11.75	117500	120000	2500
8	11.75	117500	120000	2500
		962500	**960000**	**-2500**

Interest Rate Swaps in India

With a view to deepening the money market and also to enable banks, primary dealers and all-India financial institutions to hedge interest rate risks, the Reserve Bank of India has allowed scheduled commercial banks, primary dealers and all-India financial institutions to make markets in Interest Rate swaps from July 1999. However, the market which has taken off seriously so far, is the one based on Overnight IndexSwaps(OIS). Benchmarks of tenor beyond overnight have not become popular due to the absence of a vibrant inter bank term money market. The NSE publishes MIBOR(Mumbai Inter bank Offered Rate) for three other tenors viz., 14-day, 1month and 3 months. The other longer tenor benchmark that is available is the yield based on forex forward premiums. This is called MIFOR (Mumbai Inter bank Forward Offered Rate). Reuters published 1 m, 3m, 6m, 1 yr MIFOR's are the market standard for this benchmark.

Example

XYZ company has entered into a "plain-vanilla" interest rate swap on $1,900,000 notional principal. XYZ company pays a fixed rate of 8 percent on payments that occur at 90-day intervals. Six payments remain with the next one due in exactly 90 days. On the other side of the swap, XYZ company receives payments based on the UBOR rate. Describe the transaction between XYZ company and the dealer at the end of the sixth period if the appropriate UBOR rate is 5 percent.

XYZ company owes the dealer ($1,000,000)(.08)(90/360) = $20,000. The dealer owes XYZ company ($1,000,000)(.05)(90/360) = $12,500. Net: XYZ company pays the dealer $7,500.

Example

Company X wishes' to borrow U.S. dollars at a fixed rate of interest. Company Y wishes to borrow Japanese yen at a fixed rate of interest. The amount required by the two companies are roughly the same at the current exchange rate. The companies are quoted the following interest rates :

	Yen	Dollars	Y	D
Company X	5.0%	9.6%	6	10.6
Company Y	6.5%	10.0%	7.5	11.0

Design a swap that will net a bank, acting as an intermediary, 50 basis points per annum. Make the swap appear equally attractive to the two companies.

Solution :

Let x be the spread in the yen market (in this case 150 basis points) and let y be the spread in the dollar market (40 basis points). The total gain available is x-y = 110 basis points. The bank will take 50 basis points, so that leaves 60 basis points to be split equally between X and Y. Therefore, X must end up paying 10.3% [10.6-0.30] in dollars and Y must end up paying 7.2% [7.5-0.30] in yen. One way to accomplish this is as follows :

X	Pay 6% in yen to outside lenders
	Pay 10.3% in dollars to the bank in the swap
	Receive 6% in yen from the bank in the swap
Total	**10.3% in dollars**
Y	Pay 11 % in dollars to outside lenders
	Pay 7.2% in yen to the bank in the swap
	Receive 11 % in dollars from the bank in the swap
Total	**7.20% in yen**

Note that the bank's profits of 50 basis points come from receiving 7.20% and paying 6% in yen (thereby gaining 120 basis points in yen) while receiving 10.30% and paying 11 % in dollars (thus losing 70 basis points in dollars). Also, the final exchange of principal will expose X and *Yto* exchange rate risk, but not the bank.

CURRENCY SWAPS

Introduction

In Great Britain, during the 1970's, the British government sought to encourage domestic investment by taxing foreign-exchange transactions on its own currency. This control made

it difficult for British multinational companies to transact in the foreign exchange market. As a result, British companies often engaged in what was known as back-to-back loans.

A back-to-back loan involves two companies located in separate countries. Each company will borrow money in their domestic financial marketplace and then lend this borrowed money to the other firm. By this simple exchange, each company can access the capital markets in the other country without involving foreign exchange transactions.

The currency swap is merely a simple extension of the back-to-back loan concept. The back-to-back loan suffered two problems that gave birth to currency swaps.

1. Finding counterparty with mirror image needs was often an exhaustive task for a corporation.

2. Secondly, as these back-to-back loans were two different loans, they were evidenced by two loan agreements, completely separate from one another

Currency swaps solved these problems to great extent. The currency swap would operate in a manner such that two counterparties would be brought together by a central matchmaker, or swap dealer (often an investment house or a bank) thus eliminating the exhaustive search costs to the corporation of finding another counterparty. Secondly, the transaction would now be witnessed by one document that would spell out the circumstances and provisions under the possibility of default by one counterparty.

Definition

Currency swaps involve an exchange of cash flows in two different currencies. A currency swap is a contract which commits two counter parties to an exchange, over an agreed period, two streams of payments in different currencies. These payments are each calculated using a different interest rate. At the end of the period, exchange takes place of the corresponding principal amounts, at an exchange rate agreed at the start of the contract.

Currency swap differ from interest swaps on the following counts :

1. An exchange of payments in two currencies.

2. Not only exchange of interest, but also an exchange of principal amounts.

3. Unlike interest rate swaps, currency swaps are not off balance sheet instruments since they involve exchange of principal at the end of the period.

4. The interest payments at various intervals are calculated either at a fixed interest rate or a floating rate index as agreed between the parties.

5. Currency swaps can also use two fixed interest rates for the two different currencies - different from the interest rate swaps.

6. The agreed exchange rate need not be related to the market.

7. The principal amounts can be exchanged even at the start of the swap

Example of Parallel Loan

Four parties are involved.

1) U.K. parent company, and

2) Subsidiary company in Canada.

3) Canadian parent company, and

4) Subsidiary in U.K.

Assume that typical borrowing costs are 10% in U.K. and 11 % in Canada. U.K. parent company would like to borrow money to finance expansion of its subsidiary in Canada. If it borrows in U.K. (pounds) and converts to C$ it will have to pay a price and is exposed to risk. Also, the Canadian subsidiary is not well known in Canada, so it would have to pay a 2% risk premium over the normal rate (11 + 2 = 13%), and 13% is considered too high.

Assume that the Canadian parent company is in the same situation, it has a subsidiary in UK that would have to pay a 3% risk premium because it is not well known in UK. Borrowing costs in UK (pounds) for the Canadian subsidiary would be 10% + 3% = 13%, which is considered to be excessive.

Parallel Loan

U.K. parent company borrows. in U.K. at 10% in £s, and re-lends the money to the Canadian subsidiary in U.K. Canadian parent company borrows C$ at 11% and re-Iends the money to the U.K. subsidiary in Canada. Since no currency leaves the respective countries no exposure and no taxes if applicable.

During the loan, the U.K. subsidiary in Canada earns C$ to pay the interest and principal. The Canadian subsidiary in U.K. earns pounds to pay back the loan. Result: U.K. subsidiary in Canada pays 11 % instead of 13% (savings of 2%) and the Canadian subsidiary in UK pays 10% instead of 13% (savings of 3%).

Back-to-Back Loan

Similar to a Parallel loan, but only involves 2 parties, not 4. Assume that the same conditions hold, interest = 10% in UK and interest = 11 % in Canada. British parent firm borrows in U.K. at 10% and re-lends to Canadian parent firm. Canadian parent firm borrows in Canada at 11 % and re-lends those funds to UK firm. UK firm makes payments annually to Canadian firm in C$ and Canadian firm makes payments to UK firm in pounds.

In this case the two parent companies deal directly with each other, so there are only two parties to the agreement, vs. four parties in the last example.

Potential Problems with Parallel and Back-to-Back Loans :

1. Time-consuming and expensive to set up. You have to search for and find two MNC's in almost the exact opposite position at the same time.

2. Potential for default. What if the Canadian subsidiary of the U.K. firm defaults on the parallel loan? The parent is still liable. To minimize these problems a legal document called a "rights of set-off" is usually in effect to address the potential problems of default.

Currency Swap Example

In US

U.S. MNC like GM has a subsidiary in Germany, and there is an investment opportunity for expansion in Germany that will require 40m and will have an economic life of 5 years. Current spot rate is $0.90/, so the firm could consider raising $36m in U.S. by issuing bonds at 8% (payable in Dollars), and converting $36m to 40m to finance the expenditure. Hopefully CFs (in Euros) would be generated from the project to make the interest payments in $.

Problem

Transaction Exposure (potential change in the financial position of the project due to currency changes over 5 years), because German earnings are in Euros, interest payments due in U.S. are in USD. What is the MNC worried about ?

Alternative : Raise 40m in the Eurobond market by issuing 5-year Eurobonds, payable in Euros. Eurobond rate is 6% for a well-known firm, but the German subsidiary of the U.S. MNC pays 7% because it is unknown (1% risk premium).

In Germany

Assume there is a German MNC with a mirror-image financing need. It has a U.S. subsidiary needing $36m for an expansion project in U.S. with a 5-year life.

Problem :

Transaction Exposure German MNC could borrow Euros in Germany at 6% convert to dollars, but there is transaction exposure since dollar CFs would be generated in U.S. to make Euro interest payments in Germany. Worried about what over 5 years???

Alternative : Company could issue Eurodollar bonds in U.S., but would face a 9% (normal rate is 8%) interest rate because the German subsidiary is not well-known in U.S.

Opportunity :

Swap Bank could arrange a **Currency Swap** to :

1) Eliminate the long-term currency risk for both MNCs (transaction exposure), and

2) Reduce interest expense for both companies.

   Each company has a "comparative advantage" at raising money in its home country, so each MNC would issue debt domestically at a savings of 1 % compared to the foreign MNC raising funds (U.S. company raises $36m in U.S. at 8%, vs. 9% for the German MNC; German company raises 40m in Germany at 6%, vs. 7% for the U.S. MNC).
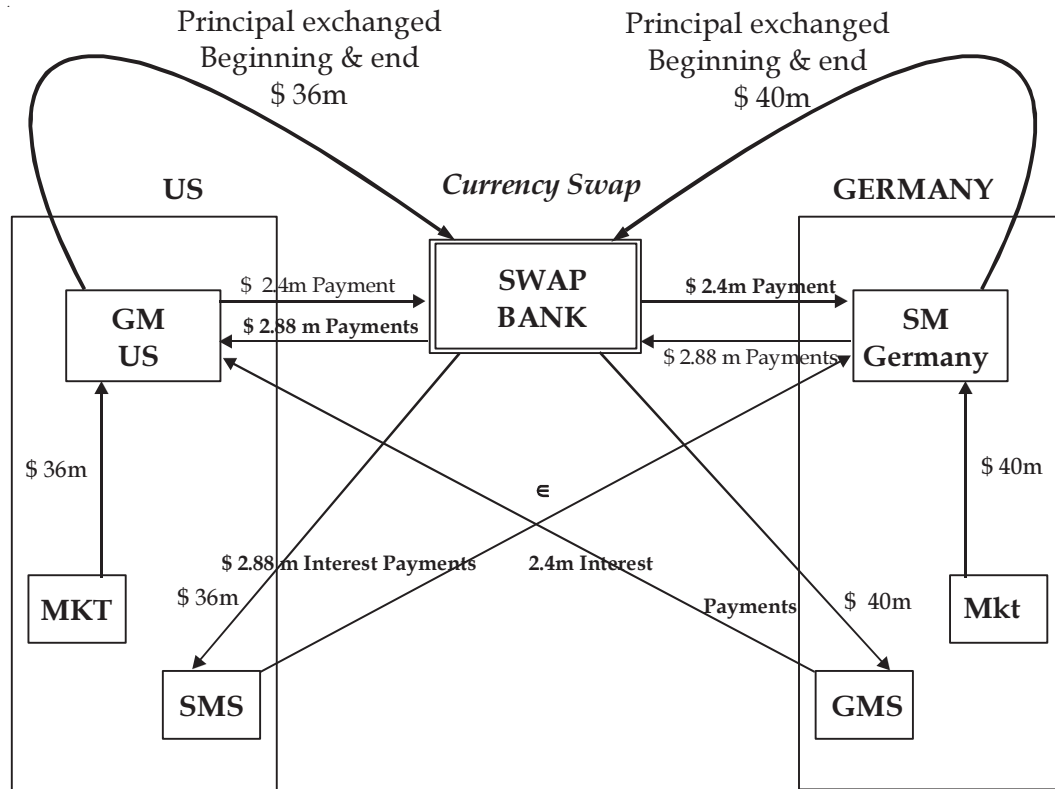
The principal sums would be exchanged through a Swap Bank - U.S. company transfers $36m to the German subsidiary in U.S. and the German company transfers 40m to the U.S. subsidiary in Germany. Every year the U.S. subsidiary in Germany would submit .2.4m (40m @ 6% - instead of borrowing at 7%) to its parent company in U.S., which would transfer the money to the Swap Bank, which transfers funds to the German MNC to pay the Euro loan. The German subsidiary in U.S. would submit $2.88m ($36m @ 8% - instead of 9% on its own) to the German MNC, which would transfer the money to the Swap Bank, and the bank would transfer to the U.S. MNC to pay for the dollar loan. At maturity, principal payments would take place the same way.

Currency swap locks in three ex-rates :

1. Principal sums are exchanged at the current ex-rate, $36m/∈40m = $.90/.

2. The contractual (implicit) exchange rate for the annual payments would be $1.20/, which is fixed.

3. The implied exchange at maturity for last interest payment and principal payment is also fixed, viz. the prevailing spot rate.

   Therefore, the currency swap locks in a fixed exchange rate and there is *no currency risk*.

Note :

At first it might seem like the German company is not getting as good of a deal compared to the U.S. firm. The German MNC borrows Euros at 6% but pays 8% in U.S. dollars. However, IRP should hold, making the two interest rates equal after adjusting for the expected change in the value of the currencies. Since int. rates are higher (lower) in the U.S. (Germany), the dollar (∈) is expected to depreciate (appreciate), by 2% per year. German MNC pays back the loan with a currency (USD) that is depreciating (USD is depreciating by 2% per year), Euro is appreciating by 2% per year.

German MNC borrows ∈s @ 6%, pays loan back in USDs at 8%, but since the dollar (Euro) is depreciating (appreciating) by 2%/year, the effective borrowing cost in Euros is 6%.

U.S. MNC borrows $s @ 8%, pays back Euros @ 6%, but since the USD (Euro) is getting weaker (stronger) by 2%, the effective borrowing cost in $ is 8%.

Point :

In equilibrium (lAP), if the Euro is selling at a forward premium of +2%/year, the Borrowing Euros at 6% is exactly equivalent to borrowing dollars at 8%.

8.4 Caps, Floors and Collars

This Section includes :

- **Interest Rate CAPS**
- **Interest Rate COLLARS**
- **Interest Rate FLOORS**

INTRODUCTION :

Interest Rate Caps, Floors and Collars are option-based Interest Rate Risk Management products.

These options products can be used to establish maximum (cap) or minimum (floor) rates or a combination of the two which is referred to as a collar structure. These products are used by investors and borrowers alike to hedge against adverse interest rate movements.

A Cap provides variable rate borrowers with protection against rising interest rates while also retaining the advantages of lower or falling interest rates.

INTEREST RATE CAPS :

Variable rate borrowers are the typical users of Interest Rate Caps. They use Caps to obtain certainty for their business and budgeting process by setting the maximum interest rate they will pay on their borrowings. By implementing this type of financial management variable rate borrowers obtain peace of mind from rising interest rates but retain the ability to benefit from any favourable interest rate movements.

Working of a Interest Rate Cap

An interest rate cap is an option in respect of maximum interest rate on borrowing. For example, a company has a plan to borrow in future and expects that present interest rate structure may increase by the time the funds are borrowed. The company may buy an interest rate cap (option) from a bank which will fix the maximum rate of interest. The bank will reimburse the company if the market rates rise above the cap rate. So, the company can fix its interest rate liability by buying an interest rate cap.

Risks : There are no risks associated with an Interest Rate Cap. It is important to understand that if interest rates do not rise above the Cap rate, you have not obtained any benefit from the purchase of the Cap.

Example

Company X has obtained a $20 million seven-year loan. The interest on the loan is payable on a six-monthly basis, and is pegged to the six-month LIBOR. To limit the maximum interest rate payable in a period without forfeiting the possibility of lower interest rates, the CFO decides to buy an interest rate cap option. The cap strike rate of 6.50% is based on the US dollar six-month LIBOR, and the maturity period is same as that of the loan. The company pays an upfront premium of 5.40% of the principal. If, on any date, the LIBOR is more than 6.50%, the company will exercise the option, and the banker will have to pay the corporate the difference.

Cap Option

Company X has raised a Five Year Dollar Loan. Interest Rates are pegged to the Libor
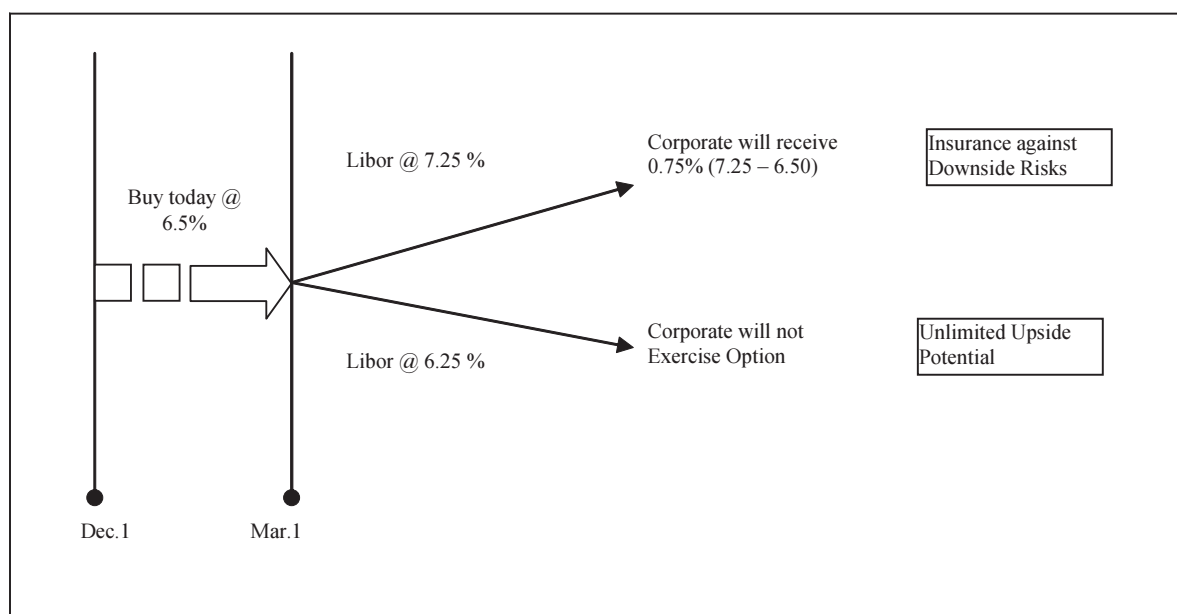
INTEREST RATE COLLAR :

Variable rate borrowers are typical users of Interest Rate Collars. They use Collars to obtain certainty for their borrowings by setting the minimum and maximum interest rate they will pay on their borrowings. By implementing this type of financial management, variable rate borrowers obtain peace of mind from the knowledge that interest rate changes will not impact greatly on the borrowing costs, with the resultant freedom to concentrate on other aspects of their business.

As Interest Rate Collar is simply a combination of an Interest Rate Cap and an Interest Rate Floor. One may receive payment of premium from St George to purchase the Interest Rate Floor which offsets the premium that he pays for the Interest Rate Cap. As such the premiums payable for an Interest Rate Collar are less than the premium payable for an Interest Rate Cap.

Working of a Interest Rate Collar

An Interest Rate Collar ensures that one will not pay any more than a pre-determined level of interest on his borrowings. St George will reimburse him the extra interest if interest rates rise above the level of the Cap. An Interest Rate Collar however, will not allow him to take advantage of interest rates below a pre-determined level. He will be required to reimburse St George the extra interest if interest rates fall below the level of the Floor. An Interest Rate Collar enables variable rate borrowers to retain the advantages of their variable rate facility while obtaining the additional benefits of a maximum interest rate, at a reduced cost to an Interest Rate Cap.

Risks:

There are risks associated with an Interest Rate Collar. It is important to understand that if interest rates fall below the Floor rate, one will have missed out on the potential reduction to his cost of funds. The cost advantages over an Interest Rate Floor may or may not compensate for this potential loss. Only one can decide if the premium savings outweigh the potential of reduced cost in a falling interest rate environment.

Example*:*

Company X has to pay off a floating rate dollar loan. It wishes to insure against the upward movements of the interest rate, but the upfront premium on a cap option will result in a large cash outflow. Therefore, the CFO decides to give away some of its possible gains by limiting the downward movement of interest rates, and creating a collar (band) for his loan. If the LIBOR moves above the collar, the bank will pay the corporate the difference. If the LIBOR dips below the collar, the corporate compensates the bank for the difference.

INTEREST RATE FLOORS :

Variable rate investors are the typical users of Interest Rate Floors. They use Floors to obtain certainty for their investments and budgeting process by setting the minimum interest rate they will receive on their investments. By implementing this type of financial management, variable rate investors obtain peace of mind from falling interest rates and the freedom to concentrate on other aspects of their business / investments.

Working of an Interest Rate Floor

An Interest Rate Floor ensures that you will not receive any less than a pre-determined level of interest on your investment. The Bank will reimburse you the extra interest incurred should interest rates fall below the level of the Floor.

An Interest Rate Floor enables variable rate investors to retain the upside advantages of their variable rate investment while obtaining the comfort of a known minimum interest rate.

Risks: There are no risks associated with an Interest Rate Floor. It is important to under-stand that if interest rates do not fall below the Floor rate, you have not obtained any benefit from the purchase of the Floor.

The position of caps, floors and collars has been shown in the following diagram.
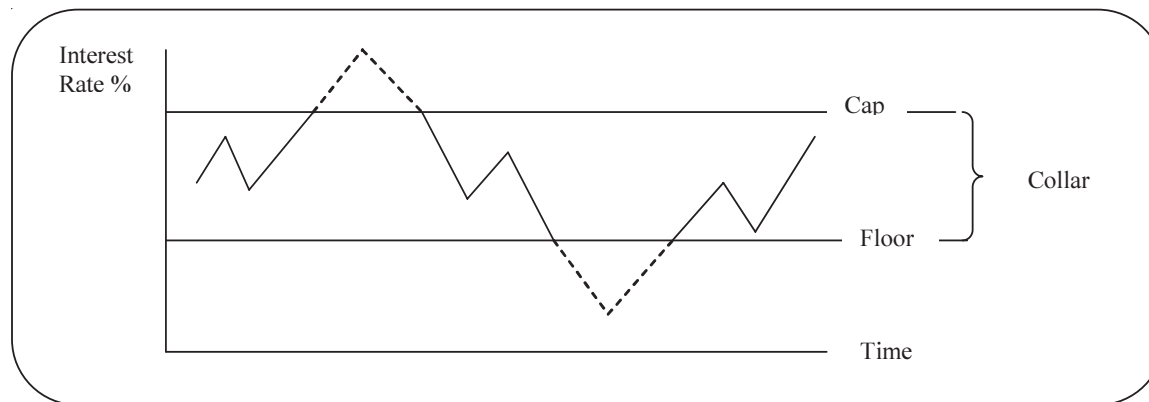
8.5 Money Market Hedge

This Section includes :

- **Concept of Money Market Hedge**
- **Process of Money Market Hedge**

INTRODUCTION :

Money market is a market for short-term instruments. In this market you can borrow or lend for a short period of time. Salient features are:

1. Short period of time – ranges from an "overnight" time period (a day comprising 24 hours from the close of business hours on day – 1 till close of business hours on day-2) to generally six to twelve months.

2. Each time period will have its own interest rates – lowest for overnight periods, and increasing gradually with the tenor of the borrowing/lending.

3. Money market rates are always given in nominal annual rates. If a rate of 8% is quoted, it means 8% per annum and will have to be adjusted for the relevant time period. A three-month tenor would thus carry interest at 2% (8 x 3/12)

4. Interest or deposit rates differ from country to country, and hence currency to currency.

CONCEPT OF MONEY MARKET HEDGE :

Most corporates would like to avoid the risk associated with fluctuating foreign exchange rates. Consider an Indian exporter who is expecting a receivable of $ 1 million to mature three months from now. Being an Indian company, it would like to know with as much certainty as possible how many rupees it will obtain by selling the dollars. Unfortunately, since it does not know what the $ - Re rate would be three months from now, the company has an exposure. The company can hedge its risk in two ways. It could sell dollars forward at a rate which it can obtain from the bank today and thus know for certain the quantum of rupee inflows after three months. Alternatively, the company could borrow dollars such that the repayment of principal and interest after three months would exactly equal $1 million. The company can repay its loan with the receivables maturing after three months. Meanwhile, it does not really need the dollars it has borrowed today. So, it could convert into rupees and invest for three months at a rate of interest which is known today. In either case, the company knows with certainty what its rupee inflow would be after three months.

A similar approach can be used in the case of a $ 1 million payable. In this case, the company could buy $ 1 million forward at a rate which is known today. Alternatively, it could borrow rupees, convert into dollars and invest the foreign currency so obtained to ensure that the dollar investment maturing after three months will be just sufficient to settle the payable. Since it knows exactly how many rupees it will have to repay after three months, it has successfully locked in the cost of funds.

We can now summarize the rules for hedging receivables and payables using forward and money markets.

a) **Receivables.**

Using **Forward market** : Sell the receivable **forward**

Using **Money market** : Borrow the foreign currency today and repay with the receivable. Convert the foreign currency borrowed into home currency and invest.

b) **Payables**

Forward market : Buy the payable forward

Money market : Borrow the home currency, convert into foreign currency, invest the foreign currency so obtained to ensure that the investment can be used to settle the payable. Payoff the home currency loan.

When money market hedging is not beneficial?

When Interest rate parity holds and no arbitrage -opportunities exist, Money Market Hedge and forward hedge provide identical costs. In such a scenario, money market hedging is not beneficial.

Review of Techniques

	To hedge Payables	**To hedge Receivables**
Forward	Negotiate a forward contract to purchase foreign currency	Negotiate a forward contract to sell foreign currency
Futures	Purchase a futures contracts of the foreign currency	Sell a futures contracts of the foreign currency
MM	Borrow home currency, convert to payable currency and invest. On maturity, settle receipt of deposit against payable.	Borrow receivable currency, convert to home currency and invest. On receipt of receivable you payoff borrowed currency
Options	Buy a CALL option of the foreign currency for the payable amount	Buy a PUT option on the foreign currency for the receivable amount

PROCESS OF MONEY MARKET HEDGE :

Money market hedge involves:

- Borrowing in foreign currency (say $) in the case of exports

- Investing in foreign currency (say ¥) in the case of imports

Steps to be adopted :

		From the view point of	
		Importer	**Exporter**
1. Find	Whether the importer or exporter have a foreign currency asset or liability.	Importer will have a FC liability	Exporter will have a FC asset
2. Create	Hedge Position	Importer will create a FC asset	Exporter will create a FC liability
3. Borrow	Amount required to be borrowed to Hedge Position	Importer will borrow home currency, for an amount equivalent to PV of FC liability, at the foreign currency deposit rate.	Exporter will borrow in FC abroad. Amount will be equal to PV FC asset, discounted at borrowing rate.
4. Convert	Convert the borrowed money into the required currency	Home currency into foreign currency at spot rate.	Foreign currency so borrowed will be converted into home currency at spot rate.
5. Invest	Invest the amount which is converted	Invest that foreign currency in abroad, as a deposit, carrying interest at the such deposit rate Investment becomes an asset	Invest the domestic currency to earn interest in home deposits
6. Settle	Encash the invested amount with interest to settle FC liability	Receive maturity proceeds of FC asset and settle FC liability	Receive the asset value from overseas customer, and settle FC liability there itself.

Several illustration :

1. Identify direct and indirect quotes. For each direct quote find Indirect quote and vice versa.

    a. Rs.75.31   = GBP 1

    b. GBP 1   = Rs.75.31

    c. Rs. 5.19   = Sw.Kr.1

    d. Rs. 126.26 = Omani Riyal 1

    e. GBP 1   = $ 0.639

Solution :

    a. This is a Direct Quote in India and Indirect Quote in Britain.

        Indirect Quote in India would be

        Re.1 = 1/75.31 = £0.0133

    b. This is a Direct Quote in India and Indirect Quote in Britain.

        Indirect Quote in India would be

        Re.1 = 1/75.31 = £0.0133

    c. This is a Direct Quote in India and Indirect Quote in Sweden

        Indirect Quote in India would be

        Re.1 = 1/5.19 = Sw.KrO.193

    d. This is a Direct Quote in India and Indirect Quote in Oman

        Indirect Quote in India would be

        Re.1 = 1/126.26 = Omani Riyal 0.0079

    e. This is a Direct Quote in US and Indirect Quote in UK

        Indirect Quote in US would be

        $1 = 1/0.639 = £ 1.565

2. The following spot rates are observed in the foreign currency market:

CURRENCY	FOREIGN CURRENCY PER U.S. $
Britain pound	00.62
Netherlands Guilder	01.90
Sweden krona	06.40
Switzerland Franc	01.50
Italy Lira	1,300.00
Japanese Yen	140.00

On the basis of this information, compute the nearest second decimal the number of

    A. British pounds that can be acquired for $ 100

    B. $ that 50 Dutch guilders will buy

    C. Swedish Krona that can be acquired for $ 40

    D. Dollars that 200 Swiss francs can buy

E. Italian Lira that can be acquired for $ 10

F. Dollars that 1000 Japanese yen will buy

Solution :

[Tip : Always find out the answer from a currency quote which you want to transact]

A. Here we have $100. To get £ we need to sell $. Thus we require a quote in dollars. Since we already have $1 = £0.62 → $100 = £100 × .62 = £ 62. Thus £62 can be acquired for $100.

B. Here we have DG 50. To get $ we need to sell DG. Thus we require a quote in DG. Since we have $1 = DG 1.90 we convert a dollar quote to a DG quote, which is simply the inverse → DG1 = $ 1/1.9 Therefore DG 50 → $ 50 × 1/1.9 = $26.32

C. Here we have $40. To get SKr we need to sell $. Thus we require a quote in dollars. Since we already have $1 = SKr 6.40 → $40 = SKr 40 × 6.40 = SKr 256. Thus 256 SKr can be acquired for $40.

D. Here we have SFr 200. To get $ we need to sell SFr. Thus we require a quote in SFr.. Since we have $1 = SFr.1.50 we convert a dollar quote to a SFr. quote, which is simply the inverse → SFr.1 = $ 1/1.5 Therefore SFr. 200 → 200/ 1.50 = $133.33

E. Similar to what is explained above we get $10 × 1,300 = 13,000 lira

F. Similar to what is explained above we get 1,000/ 140 = $7.14

3. Identify the nature of the quotes

$1.5626 per pound

0.6399 pound per dollar

Solution :

Rewrite the questions as : £1= $1.5626 & $1 = £0.6399

The first one is a direct quote in US and the second one is a Direct Quote in UK and vice versa

4. Direct quote for pounds Sterling in New York is 1.5636. Compute direct quote in London.

Solution :

Direct Quote in US will be £ quote in terms of $. Therefore £1 = $1.5636

In London Direct Quote will be $ quote in terms of £ Le. $1 = 1/1.5636 = £0.6395

5. Assuming you are the calling bank and the following rates per $ is quoted against S F.

Day	Quotes
1	1.6962/78
2	1.6990/1.7005
3	1.7027/42
a.	On which day is it cheaper to buy US $ with respect to SF?
b.	How many US $ do you need to buy 1000 SF on Day 1?
c.	What is the spread on Day 2?
d.	If you exchanged $ 2500 for SF 4256.75 on which day did you exchange?

Solution :

Please note that the rates are given for Dollars against SF Le. (SF/$)

a. The dollar is cheap to buy on the 1st day.

b. Here we need to buy SFr 1000. Thus we require a quote in SFr.. Since we have a $ quote, we convert to a SFr. quote, which is simply the inverse.

$1 = S.F. 1.6962/1.6978

∴ S F1 = $ 0.5890/0.5896

To buy 1000 SF we have to pay (buyer pays more)

= 1000×0.5896= $ 589.60

c. Spread on day 2   = 1.7005 – 1.6990 = 0.0015 = 15 points

d. $2500   = S F4256.75

Therefore $1   = S F 4256.75/2500 7 Sf 1.7027

This matches with the bid rate on the 3rd day.

6. In the inter-bank market, the DM is quoting Rs.21.50. If the bank charges 0.125% commission for TT selling and 0.15% for TT buying, what rate should it quote?

Solution :

TT selling rate = 21.50 (1 – 0.00125) = As. 21.47/DM

TT buying rate = 21.50 (1 + 0.00150) = As. 21.53/DM

Appreciation / Depreciation

7. The price of Swedish Krones is $0.14 today. If it appreciates by 10% today, how many Krones a dollar will buy tomorrow?

Solution:

The price of Swedish Krones is $0.14 today. A 10 percent appreciation will make it worth $0.154 tomorrow. A dollar will buy 1/0.154 = 6.49351 Krones tomorrow.

8. Given the following quotes for per unit of each currency against US dollar, on two different dates :

British pound	1.5398	1.6385
Canadian dollar	0.6308	0.6591
EMU euro	0.9666	1.0835
Japanese yen	0.008273	0.008343
Mexican peso	0.1027	0.0917
Swedish krona	0.1033	0.1179

What is the rate of appreciation or depreciation of each currency over the period?

Solution :

Pound	= ($1,.6385 - $1.5398)/$1.5398 = +0.0641 = +6.41%.
Canadian dollar	= ($0.6591 - $0.6308)/$0.6308 = +0.0449 = +4.49%.
Euro	= ($1,0835 - $0.9666)/$0.9666 = +0.1209 = +12.09%.
Yen	= ($0.008343 - $0.008273)/$0.008273 = +0.0085 = +0.85%.
Peso	= ($0.0917 – $0.1027)/$0.1027 = -0.1071 = -10.71%.
Krona	= ($0.1179 - $0.1033)/$0.1033 = +0.1413 = +14.13%.

9. The exchange rate for Mexican peso was 0.1086 in December 2004, and 0.0913 in November 2004, against dollar. Which currency has depreciated and by how much?

Solution :

Nov 2004 rate :   Peso1 = $ 0.1086

Dec 2004 rate :   Peso1 = $ 0.0913

This means Mexican peso has depreciated against the US dollar.

The rate of depreciation of Peso can be calculated as:

(0.0913-0.1086)/0.1086 = – 0.0173/0.1086 = – 0.159.

In other words, from November 2004 to December 2004, the Mexican peso depreciated 15.9% against the US dollar.

10. The dollar is currently trading at Rs. 40. If Rupee depreciates by 10%, what will be the spot rate? If dollar appreciates by 10% what will be the spot rate?

Solution :

To find appreciation or depreciation of a rupee, we need to have a quote of Re. Since we are given $ quote, we need to convert the same to Re. quote. (which is simply the inverse)

i.e. Re. 1 = $1/40 = $ 0.025

If rupee depreciates by 10%, then   = 0.025–0.0025 = 0.0225

The new spot rate would be $1   = Re.0.0225

And, if dollar appreciates by 10%, then we can apply 10% directly to the given $ quote. Therefore, 40+ 40*0.1 = 44

The new spot rate would be $1 = Rs.44

11. A French Co., has shipped 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 $ 124000. Presently spot rate is 5.70 F to the $; if the F were to strengthen by 5% by the end of 90 days what would be the transactions gain or loss in F ? If it were to weaken by 5% what would happen? Make calculations in F per $.

Solution :

Given spot rate $1 = F 5.70. If F strengthens $ weakens. Therefore $1=F 5.70*0.95 = F5.415. However, if F weakens, $ strengthens and therefore $1 = F5.70*1.05 = F5.985.

The transaction before and after (weakening & strengthening of F can be summarized below)

	French Franc Strengthens	**French Franc Weakens**
Before	$124,000 × 5.70 = F706,800	$124,000 × 5.70 = F706,800
After	$124,000 × 5.415 = F671,460	$124,000 × 5.985 = F742,140
Gain (Loss)	(F35340)	F35340

12. ICICI Mumbai quotes Rs. 26.45/65 for Australian Dollar. Compute Bid, Ask and spread. Also show what they would quote if it were an indirect quote.

Solution :

Bid quote   = Rs. 26.45 Ask quote = Rs. 26.65

Spread   = Rs. 26.65 - Rs. 26.45 = 0.20 paise per Australian Dollar (AUD)

Indirect Quote would be Rupees in terms of AUD

i.e. Re1.   = AUD 0.0375/0.0378

13. Given the following one-, three-, and six-month outright forward European term bid-ask quotes.

Find the respective bid-ask spreads in points.

Spot 1.3431-1.3436

One-Month 1.3432-1.3442

Three-Month 1.3448-1.3463

Six-Month 1.3488-1.3508

Solution :

Bid-Ask Spread

Spot   5

One-Month   10

Three-Month   15

Six-Month   20

14. Following are the quotes given by the Banker in Mumbai. Find out Bid Rate, Offer Rate, Spread in %.

    a.   INR / $ 48.72 - 48.94

    b.   INR / 44.44 - 44.67

    c.   INR / i: 71.00 - 71.12

    d.   INR / f 4.52 - 4.78

    e.   INR /100 ¥ 38.01 - 38.14

Solution :

Exchange Rates	Bid rate	Offer rate	Spread	Spread %
INR / $ 48.72 - 48.94	48.72	48.94	0.22	=0.22/48.72=0.45%
INR / 44.44 - 44.67	44.44	44.67	0.23	=0.23/44.44=0.52%
INR /i: 71.00 - 71.12	71.00	71.12	0.12	=0.12/71.00=0.17%
INR / f 4.52 - 4.78	4.52	4.78	0.26	=0.26/4.52=5.75%
INR /100 ¥ 38.01 - 38.14	38.01	38.14	0.13	=0.13/38.01 =0.34%

15. Consider the following quotes.

Spot (Euro/Pound) =   1.6543/1.6557

Spot (Pound/NZ$) =   0.2786/0.2800

1. Calculate the % spread on the Euro/Pound Rate

2. Calculate the % spread on the Pound / NZ $ Rate

3. The maximum possible % spread on the cross rate between the Euro and the NZ $

Solution :

a.   The % spread on Euro/Pound $= \dfrac{1.6557 - 1.6543}{1.6543} \times 100 = 0.085\%$

b.   The % spread on Poundl NZ $ $= \dfrac{0.2800 - 0.2786}{0.2786} \times 100 = 0.50\%$

c.   The maxium possible % spread on the cross rate between ∈ & NZ $ → To find cross rate first.

Given Spot (Euro/Pound)   = 1.6543/1.6557

Spot (Pound/NZ$)   = 0.2786/0.2800

Spot (Euro/NZ$)   = 0.2786×1.6543/0.2800×1.6557

= 0.4609/0.4636

The maximum % spread on Eurol NZ $ $= \dfrac{0.4636 - 0.4609}{0.4609} \times 100 = 0.59\%$

Cross Rates

Remember the following before proceeding ahead

Rule 1

$$\frac{A}{B} = \frac{A}{C} \times \frac{C}{B}$$

$$\text{Bid}\left(\frac{A}{B}\right) = \text{Bid}\left(\frac{A}{C}\right) \times \text{Bid}\left(\frac{C}{B}\right)$$

$$\text{Ask}\left(\frac{A}{B}\right)=\text{Ask}\left(\frac{A}{C}\right)\times\text{Ask}\left(\frac{C}{B}\right)$$

Rule 2

$$\text{Bid}\left(\frac{A}{B}\right)=\frac{1}{\text{Ask}\left(\dfrac{B}{A}\right)}$$

16. Fill in the boxes indicated by alphabets in the following table.

Country	USD	AUD	GBP	CAD	FRF	DEM
US	—	1.5122	0.6241	1.4727	6.2657	1.8682
Australia	a	—	0.4127	0.9739	4.1435	1.2354
Britain	1.6023	2.4230	—	2.3597	10.0395	f
Canada	0.6790	1.0268	c	—	4.2546	1.2686
France	0.1596	b	0.0996	d	—	0.2982
Germany	0.5353	0.8094	.0.3341	0.7883	e	—

Solution :

a.	Given AUD/USD	= 1.5122	⇔ USD/AUD	= 1/1.5122 = 0.6613
b.	Given FRF/AUD	= 4.1435	⇔ AUD/FRF	= 1/4.1435 = 0.2413
c.	Given CAD/GBP	= 2.3597	⇔ GBP/CAD	= 1/2.3597 = 0.4238
d.	Given FRF/CAD	= 4.2546	⇔ CAD/FRF	= 1/4.2546 = 0.2350
e.	Given DEM/FRF	= 0.2982	⇔ FRF/DEM	= 1/0.2982 = 3.3535
f.	Given GBP/DEM	= 0.3341	⇔ DEM/GBP	= 1/0.3341 = 2.9931

17. Find the direct cross quote of French Francs in India, given that

Rs./USD = 44.04/44.08

USD/AUD = 18.05/18.08

GBP/AUD = 0.4119/0.4127
GBP/FRF = 0.0996/0.0999

Solution :

$$\frac{\text{Rs.}}{\text{FRF}}=\frac{\text{Rs}}{\text{USD}}\times\frac{\text{USD}}{\text{AUD}}\times\frac{\text{AUD}}{\text{GBP}}\times\frac{\text{GBP}}{\text{FRF}}$$

$$\left(\frac{Rs.}{FRF}\right)_{Bid} = \left(\frac{Rs.}{USD}\right)_{Bid} \times \left(\frac{USD}{AUD}\right)_{Bid} \times \left(\frac{AUD}{GBP}\right)_{Bid} \times \left(\frac{GBP}{FRF}\right)_{Bid}$$

$$= \left(\frac{Rs.}{USD}\right)_{Bid} \times \left(\frac{USD}{AUD}\right)_{Bid} \times \frac{1}{\left(\dfrac{GBP}{AUD}\right)_{Ask}} \times \left(\frac{GBP}{FRF}\right)_{Bid}$$

= 44.04*18.05*2.4230*0.0996 = Rs.191.84

Similarly, $\left(\dfrac{Rs.}{FRF}\right)_{ask} = = \left(\dfrac{Rs.}{USD}\right)_{Ask} \times \left(\dfrac{USD}{AUD}\right)_{Ask} \times \dfrac{1}{\left(\dfrac{GBP}{AUD}\right)_{Bid}} \times \left(\dfrac{GBP}{FRF}\right)_{Ask}$

Therefore, $(Rs/FRF)_{Ask}$ = 44.08*18.08*2.4277*0.0999 = Rs. 193.29

The above information can be displayed in tabular form as :

Country	USD	GBP	INR
USD	–	–	44.04/44.08
AUD	18.05/18.08	0.4119/0.4127	–
FRF	–	0.0996/0.0999	191.84/193.29

18. Portugal Escudo is quoted in London at 313.00. Frankfurt is quoting Pd. Sterling at 1.561. Compute the indirect quote Escudo/Euro.

Solution :

£ 1 = 313 Escudo £1 = 1.561

To find indirect quote of Escudo/Euro;

From the above we get 313 Escudo = 1.561

Therefore 1 Escudo = 0.0050

This is a direct quote Euro/Escudo or Indirect quote of Escudo/Euro.

19. Assume you have a German customer who experts to London and would like to sell pounds against Euros. The following market rates prevail :

Euro/$ 1.1875/1.1890

Pound/$ 0.6957/0.7008

If your customer wants a Cross Rate for Pound/Euro in Euro terms from you, what rate will you quote assuming you want a spread of 0.0020 points.

Solution :

Given $1 = €.1.1875/1.1890 (€/$)

$1 = £ 0.6957/0.7008   (£/$)

German exporter would receive pounds and would like to sell them to have them converted to euros.

Therefore, we need bid $\in/£$ quote.

We know that Bid $\text{Bid}\left(\dfrac{\text{Euro}}{£}\right) = \text{Bid}\left(\dfrac{\text{Euro}}{\$}\right) \times \text{Bid}\left(\dfrac{\$}{£}\right)$

Since we do not have a quote of $\$/£$, and have $£/\$$ quote, we use

$$\text{Bid}\left(\frac{\$}{£}\right) = \frac{1}{\text{Ask}\left(\dfrac{£}{\$}\right)}$$

Substituting, the values we get Bid rate for $\$/£ = 1.1875 \times 1/0.7008 = 1.6945$

If the German would like to sell pound, he would be given c 1.6945 – 0.0020 (the spread required) = $\in$1.6925 per £.

20. If the following quotes are available, what is the Cross exchange rate, yen/shekel?

   $1 = 4.0828 Israeli shekel; $1 = 111.23 Japanese yen ;

Solution :

We have

$$\text{Cross Rate} : \frac{\text{Dollars}}{\text{Shekel}} \times \frac{\text{Yen}}{\text{Dollar}} = \frac{\text{Yen}}{\text{Shekel}}.$$

Note that an indirect quotation is given for Israeli shekel; however, the cross rate formula requires a direct quotation. The indirect quotation is the reciprocal of the direct quotation. Thus we get

$$\frac{1}{\dfrac{\text{Shakel}}{\text{Dollar}}} \cdot \frac{\text{Yen}}{\text{Dollar}} = \frac{\text{Yen}}{\text{Shekel}}$$

$$= \frac{111.23}{4.0828}$$

Therefore Yen/Shekel = 27.2436 yen per shekel.

21. Given that :

	U.S. $ Equivalent	Currency per U.S. $
British pound	1.6385	0.6103
Swedish krona	0.1179	8.4818

   What is the Cross quote of Kronas/Pound?

Solution :

Cross rate = kronas/dollar × dollars/pound = kronas/pound

= 8.4818 × 1.6385 = 13.8974 kronas per pound.

22. Given the following information, what are the DM/S$ currency against currency bid-ask quotations?

	Bid	Ask	Bid	Ask
Deutsche Marks	0.6784	0.6789	1.4730	1.4741
Singapore Dollar	0.6999	0.7002	1.4282	1.4288

Solution :

We have $(DM/S\$_b) = (\$/S\$_b) \times (DM/\$_b) = 0.6999 \times 1.4730 = 1.0310$.

Similarly, it is implied that $S(DM/S\$_a) = S(\$/S\$_a) \times \$(DM/\$_a) = 0.7002 \times 1.4741 = 1.0322$.

Thus, the DM/S$ bid-ask spread is DM1.0322–DM1.0310 = 0.0012.

23. An Indian bank sells FF 1,000,000 spot to a customer at Rs.6.40. At that point of time, the following rates were being quoted.

FF/$: 5.5880/5.5920
Rs./$: 35.50/35.60

How much profit do. you think the bank has made in the transaction?

Solution :

We first need to calculate only the Rs./FF forward Offer/Ask rates. This is because customer buys FF from the bank.

$$Ask\left(\frac{Rs.}{FF}\right) = Ask\left(\frac{Rs.}{\$}\right) \times Ask\left(\frac{\$}{FF}\right)$$

$$Ask\left(\frac{Rs.}{FF}\right) = Ask\left(\frac{Rs.}{\$}\right) \times Bid\frac{1}{\left(\frac{FF}{\$}\right)}$$

= 35.60 × 1/5.588
= 6.3708

Thus, the exchange rate at which the bank does the cover transaction is = Rs. 6.3708/FF.

So, profit for the bank = (6.40 – 6.3708) (1,000,000) = Rs. 29,200.

24. As a dealer in the bank, you observed the following quotes in the market.

Rs./$ 42.18   42.60
Rs./£ 68.59   69.96
Rs./∈ 46.25   47.17

Compute the cross rates for $/£ and $/∈.

Solution :

To calculate the $/£ bid and offer rates, we calculate :

$$Bid\left(\frac{\$}{£}\right) = Bid\left(\frac{\$}{Rs.}\right) \times Bid\left(\frac{Rs.}{£}\right) \& Ask\left(\frac{\$}{£}\right) = Ask\left(\frac{\$}{Rs.}\right) \times Ask\left(\frac{Rs.}{£}\right)$$

Substituting we get as follows:

Bid ($/£) = 1/Ask (Rs./$) × Bid (Rs./£) = 1/42.6 × 68.59 = 1.6101

Ask ($/£)= 1/Bid (Rs./$) ×Ask (Rs./£) = 1/42.18 × 69.96 = 1.6586

Now, to calculate the $/∈ bid and offer rates, we calculate :

$$\text{Bid}\left(\frac{\$}{\in}\right) = \text{Bid}\left(\frac{\$}{\text{Rs.}}\right) \times \text{Bid}\left(\frac{\text{Rs.}}{\in}\right) \, \& \, \text{Ask}\left(\frac{\text{Rs.}}{\in}\right) = \text{Ask}\left(\frac{\$}{\text{Rs.}}\right) \times \text{Ask}\left(\frac{\text{Rs.}}{\in}\right)$$

Substituting we get as follows :

Bid ($/∈) = 1/Ask (Rs./$) × Bid (Rs./∈) = 1/42.6 × 46.25 = 1.0856

Ask ($/∈) = 1/Bid (Rs./$) × Ask (Rs./∈) = 1/42.18 × 47.17 = 1.1183

25. If the value of a Malaysian Ringgit ($/MR) was 0.2632, and the value of an Indian rupee ($/Rs.) was 0.02212. Find the value of a Malaysian Ringgit in terms of Indian rupee.

Solution :

We have $/MR and $/Rs. We need to find Rs./MR.

We have Rs./MR = Rs./$ x $/MR.

$$= 1/(\text{Rs.}/\$) \times \$/\text{MR}$$

$$= 1/0.02212 \times 0.2632 = 11.90$$

26. From the following quotes of a bank, determine the rate at which Yen can be purchased with Rupees.

Rs./Pd. Sterling	75.31-33
Pd.Sterling/Doliar	1.563-65
Dollar/Yen	1.048/52 [Per 100 Yen]

Solution :

To purchase ¥ we need to have a quote of ¥ in terms of rupees i.e. ¥1 = Rs. ? and we need only the ask quote.

$$\text{Ask}\left(\frac{\text{Rs.}}{¥}\right) = \text{Ask}\left(\frac{\text{Rs.}}{£}\right) \times \text{Ask}\left(\frac{£}{\$}\right) \times \text{Ask}\left(\frac{\$.}{¥}\right)$$

= 75.33 × 1.565 × 1.052 =

= Rs.124.02 [Per 100 Yen]

27. A spot rate is DM = $0.3302-10. Another spot rate is FF= $ 0.1180-90. Compute direct quote of FF in Germany.

Solution :

To find Direct Quote of F in Germany. i.e. we need to find DM/F.

$1 = DM 1/0.3310/1/0.3302

$1 = DM 3.0211/3.0284

Similarly $ 1= F 8.4034/8.4746

Therefore   DM 3.0211/3.0284 ⇔ F 8.4034/8.4746

Therefore   DM/F = (3.0211/8.4034)/(3.0284/8.4746)

DM/F = 0.3595/0.3574

28. Following spot rates are available in the London market.

Currency	Buying rate	Selling Rate
French Francs	10.24	10.30
Swedish Kroner	13.50	13.75
Japanese Yen	170	175

Since these currencies are in short supply, you are required to operate through only sterling, which is quoted at Rs.75.25-35 in Mumbai.

a.   Compute the quantum of French Franc that you can buy for Rs.1 ,20,000.

b.   What is the likely rate of Yen against Swedish Kroner.

Solution:

a.   Given £1 = F10.24/10.30 and £1 = Rs.75.25/75.35

Using the general rules, we know

To find F/Rs. (because we have Rupees). Since we need to sell Rupees, we need only bid side of cross quote. (Rs./FF).

Here we have $= Bid\left(\dfrac{FF}{Rs.}\right) = Bid\left(\dfrac{FF}{£}\right) \times Bid\left(\dfrac{£}{Rs.}\right)$

We do not have a quote of £/Rs., instead we have Rs./£. Hence we use

$$Bid\left(\dfrac{£}{Rs.}\right) = \dfrac{1}{Ask\left(\dfrac{Rs.}{£}\right)}$$

Substituting, the values we get Bid rate for F/Rs. = 10.24/75.35 = 0.1359

Similarly $Ask\left(\dfrac{FF}{Rs.}\right) = Ask\left(\dfrac{FF}{£}\right) \times \dfrac{1}{Bid\left(\dfrac{£}{Rs.}\right)} = 10.30/75.25 = 0.1369$

We get the quote as F/Rs. = 0.1359/0.1369

For by selling As. 1,20,000 we get = F 120000 × 0.1359 = F 16308

b.   £1 = Sw.Kr.13.50/13.75 (Sw.Kr./£)

£1 = ¥ 170/175   (¥/£)

We need Sw.Kr./¥ rate.

We know that $\text{Bid}\left(\dfrac{\text{Sw.Kr.}}{\yen}\right) = \text{Bid}\left(\dfrac{\text{Sw.Kr.}}{\pounds}\right) \times \text{Bid}\left(\dfrac{\pounds}{\yen}\right)$

We do not have a quote of £/¥., instead we have ¥/£ Hence we use

$$\text{Bid}\left(\frac{\pounds}{\yen}\right) = \text{Ask}\,\frac{1}{\text{Ask}\left(\dfrac{\pounds}{\yen}\right)}$$

Substituting, the values we get Bid rate for Sw.Kr./¥ = 13.50 × 1/175 = 0.077

Similarly $\text{Ask}\left(\dfrac{\text{Sw.Kr.}}{\yen}\right) = \text{Ask}\left(\dfrac{\text{Sw.Kr.}}{\pounds}\right) \times \dfrac{1}{\text{Bid}\left(\dfrac{\pounds}{\yen}\right)} = 13.75 \times 1/170 = 0.081$

We get the quote as Sw.Kr./¥ = 0.077/0.081

29. If the following rates are prevailing :
Euro/$: 1.1916/1.1925 and $/£ : 1.42/1.47,
What will be the cross rate between Euro/Pound?

Solution :

Given £1 = $1.42/1.47 ($/£)
$1 = 1.1916/1.1925   (∈/$)
We need ∈/£

We know that $\text{Bid}\left(\dfrac{\text{Euro}}{\pounds}\right) = \text{Bid}\left(\dfrac{\text{Euro}}{\$}\right) \times \text{Bid}\left(\dfrac{\$}{\pounds}\right)$

Substituting, the values we get Bid rate for ∈/£ = 1.1916 × 1.42 = 1.6921
Substituting, the values we get Ask rate for ∈/£ = 1.1925 × 1.47 = 1.7530
We get the quote as ∈/£ = 1.6921/1.7530

30. Swiss exporter who sells to Denmark must sell Euros and Purchase Swiss Francs.

a.   What options are available to him considering the following market rates
SFr/$ 1.7654
Euro/$ 1.1918
Euro/SFr   0.6566

b.   What should he do?

Solution :

a.   Option I →
Sell ∈ against 1.1918 per $, and purchase Swiss Francs against $ at SFr 1.7654
Option II →
Sell ∈ against SFr. at the direct cross rate of ∈/SFr. 0.6566

b. The Swiss exporter must determine the cross rate equivalent of dealing in $ against ∈ at 1.1918. and against SFr. at 1.7654 and then compare the result with the given cross rate of 0.6566.

For this we need to calculate the cross rate ∈/SFr.

We know that $\text{Bid}/\text{Ask}\left(\dfrac{\text{Euro}}{\text{SFr.}}\right)=\text{Bid}/\text{Ask}\left(\dfrac{\text{Euro}}{\$}\right)\times\text{Bid}/\text{Ask}\left(\dfrac{\$}{\text{SFr.}}\right)$

We do not have a quote of $/SFr., instead we have SFr./$ Hence we use

$$\textbf{Bid}/\text{Ask}\left(\dfrac{\$}{\text{SFr.}}\right)=\dfrac{1}{\text{Ask}/\text{Bid}\left(\dfrac{\text{SFr.}}{\$}\right)}$$

Substituting, the values we get rate for ∈/SFr. = 1.1918 × 1/1.7654 = 0.6751

The German must now decide whether to purchase directly or through dollars.

Forward Rates

31. Restate the following one-, three-, and six-month outright forward European term bid-ask quotes in forward points and bid-ask spreads in points.

    Spot   1.3431-1.3436
    One-Month   1.3432-1.3442
    Three-Month   1.3448-1.3463
    Six-Month   1.3488-1.3508

Solution :

Forward Points

    One-Month   01/06
    Three-Month   17/27
    Six-Month   57/72

32. The following quotes are available

    Spot (DM/$)   : 1.5105/1.5120
    Three-month swap points : 25/20
    Six-month swap points   : 30/25

    Calculate the three-month and six-month outright forward rates.

Solution :

In this case, swap points are given in descending order. Hence, we have to subtract the swap points from the spot rates to arrive at the outright forward rates. This will ensure that the spread widens (by subtracting the larger number from the bid rate and the smaller number from the offer rate) as the time horizon increases.

Three-month forward bid rate   = 1.5105 - 0.0025 = 1.5080

Three-month forward offer rate = 1.5120 - 0.0020 = 1.5100

Six-month forward bid rate   = 1.5105 - 0.0030 = 1.5075

Six-month forward offer rate   = 1.5120 - 0.0025 = 1.5095

33. You are given the following information

Spot DM/$: 1.5105/1.5130

Three-month swap   : 25/35

Spot $/£   : 1.6105/1.6120

Three-month swap   : 35/25

Calculate the three-month DM/£ rate.

Solution :

The first rule we apply is that when the swap points are in ascending order we add to the spot rate and when they are in descending order, we subtract from the spot rate in order to arrive at the forward rate. This is to increase the spread.

DM/$ Three-month forward.

   Bid   : 1.5105+0.0025=1.5130

   Offer : 1.5130 + 0.0035 = 1.5165

$/£ Three-month forward :

   Bid   : 1.6105 - 0.0035 = 1.6070

   Offer : 1.6120 - 0.0025 = 1.6095

To calculate the DM/£ forward bid and offer rates, we calculate :

$$\text{Bid}\left(\frac{DM}{£}\right) = \text{Bid}\left(\frac{DM}{\$}\right) \times \text{Bid}\left(\frac{\$}{£}\right) \quad \& \quad \text{Ask}\left(\frac{DM}{£}\right) = \text{Ask}\left(\frac{DM}{\$}\right) \times \text{Ask}\left(\frac{\$}{£}\right)$$

The forward bid rate = Bid (DM/£) = DM 1.5130 * 1.6070 = DM 2.431/£

The forward ask rate = Ask (DM/£) = DM 1.5165 * 1.6095 = DM 2.441/£

Thus, the forward quote will be DM/£ : 2.431/2.441

34. A bank has to submit a quote to a customer for buying DM against Rupees. The customer will have the option of taking delivery of Rs. at the end of the second month. Given the following spot and forward rates what rate should it quote?

Rs./$ Spot   : 35.20/35.30

One-month forward   : 15/25

Two-month forward   : 20/30

DM/$ Spot   : 1.51/1.52

One-month forward   : 15/10

Two-month forward   : 20/15.

Solution :

In this case, the outright Rs./$ forward rates have to be obtained by adding swap points to the spo' rates. In the case of DM/$, the swap points have to be subtracted from the spot rates to obtain the outright forward bid rates.

Rs./$:	One-month forward	:	Bid	:	35.20	+	0.15	=	35.35
			Offer:		35.30	+	0.25	=	35.55
Rs./$:	Two-month forward	:	Bid	:	35.20	+	0.20	=	35.40
			Offer:		35.30	+	0.30	=	35.60
DM/$:	One-month forward	:	Bid	:	1.51	–	0.15	=	1.36
	One-month forward		Offer:		1.52	–	0.10	=	1.42
DM/$:	One-month forward	:	Bid	:	1.51	–	0.20	=	1.31
	Two-month forward		Offer:		1.52	–	0.15	=	1.37

Since the delivery is made during the second month, the bank will base its quotation on the rate prevailing for end of the second month.

When the bank sells DM for $, it will base its rate on the two-month forward rate as this is the more diverse rate. Thus, it will have to sell DM 1.37 to obtain $1.

When it sells $1, it will base itself on the two-month rate. It will expect to get only Rs. 35.40 per $. So, DM 1.37 = Rs. 25.84/DM.

$$\left(\frac{Rs.}{\$}\right) \times \frac{1}{\left(\frac{DM}{\$}\right)} = \frac{35.4}{1.37} = 25.84$$

35. A customer wants to sell a bill worth $ 1,000,000 to a bank. The bill matures at the end of the second month. If the bank charges a margin of 0.5% and exchange rates are as given below, determine the rate which the bank is likely to quote.

Rs./$ spot   :   35.50/35.55

One-month forward : 15/10

Two-month forward : 20/ 15

Solution :

We first determine the outright forward rates. In this case, since the swap points are in descending order, we have to subtract from the spot rates to obtain the outright forward rates.

One-month forward   :   35.35/35.45

Two-month forward   :   35.30/35.40

When the customer sells $ to obtain Rupees, the bank will quote the rate prevailing for second month i.e. Rs. 35.30/$.

Subtracting a margin of 0.5%, the rate quoted by the bank will be (35.30) (1-0.005) = Rs. 35.12/$.

36. An Indian customer who has imported equipment form Germany has approached its bank for booking a forward DM contract. The delivery is expected at the end of the sixth months from now. The following rates are being quote.

DM/$ spot   : 1.584/1.585

Three-month forward   : 0.030/0.029

Six-month forward   : 0.059/0.058

Rs./$ spot   : 35.60/35.70

Three-month forward   : 15/25

Six-month forward: 20/30 What rate will the bank quote if it needs a margin of 0.5%?

Solution :

We first calculate the outright forward rates (Rs./DM). In the case of Rs./$, since the swap points are in descending order, we work out the outright forward rates by subtracting the swap points. In the case of DM/$ rates, since the swap points are in descending order, we subtract the swap points.

The outright forward rates are given below :

DM/$:	Spot	:	1.584/1.585
	Three-month forward	:	1.554/1.556
	Six-month forward	:	1.525/1.527
Rs./$:	Spot	:	35.60/35.70
	Three-month forward	:	35.75/35.95
	Six-month forward	:	35.80/36.00

We first need to calculate only the Rs./DM forward Offer/Ask rates. This is because customer buys DM from the bank.

$$\text{Ask}\left(\frac{\text{Rs.}}{\text{DM}}\right) = \text{Ask}\left(\frac{\text{Rs.}}{\$}\right) \times \text{Ask}\left(\frac{\$}{\text{DM}}\right)$$

$$\text{Ask}\left(\frac{\text{Rs.}}{\text{DM}}\right) = \text{Ask}\left(\frac{\text{Rs.}}{\$}\right) \times \text{Bid}\frac{1}{\left(\frac{\text{DM}}{\$}\right)}$$

= 36 × 1/1.525 = 23.61

Adding a margin of 0.5%, the bank will quote a rate of (23.61) (1+0.005)=Rs.23.73/DM.

37. You are a banker. A client has approached you for a quote to purchase DM 1,000,000. The client will be receiving the amount at the end of third month.

You collect the following information:

Bombay : (Rs./$) spot   : 42.50 /43.00

2 month forward   : 43.00/43.60

3 month forward   : 43.60/44.20

Singapore : (DM/$) spot   : 1.68/1.69

2 month forward   : 1.69/1.70

3 month forward   : 1.71/1.72

What rate should you quote to the customer?

Solution :

The client wants to purchase DM. He will have to be quoted DM rate in terms of Rs. We therefore need to find Rs./DM 3 month forward offer (Ask) rates. We calculate as below :

$$\text{Ask}\left(\frac{\text{Rs.}}{\text{DM}}\right) = \text{Ask}\left(\frac{\text{Rs.}}{\$}\right) \times \text{Ask}\left(\frac{\$}{\text{DM}}\right)$$

Now 3 month forward Rs./$ Ask quote is = Rs.44.20 and

3 month forward $/DM Ask quote is = 1/Bid (DM/$) = 1/1.71 = 0.585

Thus Rs./DM quote is = 44.2 × 0.585 = Rs.25.857

The bank will quote Rs. 25.857.

38. Jupiter, a hundred percent export oriented company based at Chennai, exports leather jackets to various European countries. All exports are invoiced in Euro. In April, 2000, Jupiter has sent a consignment to an import house based at Frankfurt. The receivable is likely to be realized at the end of July, 2000. Jupiter approaches its banker to sell these euro earnings. The banker has the following information :

Rs./$ spot   43.50/60

2-m forward   25/30

3-m forward   40/50

Euro/$ spot   1.0420/1.0430

2-m forward   1.0400/1.0415

3-m forward   1.0380/1.0400

You are required to :

Calculate the rupee inflow for Jupiter in July, if the expected Euro of one million is sold to the banker forward?

Solution :

We are given Rs./$ & €/$ rates. We have to calculate the Rs./€ bid as Jupiter would sell at Bid rates. Moreover we are interested in calculating only the 3-month forward rates i.e. July rate only, because the euros are due only in July.

$$\text{Bid}\left(\frac{\text{Rs.}}{€}\right) = \text{Bid}\left(\frac{\text{Rs.}}{\$}\right) \times \text{Bid}\left(\frac{\$}{€}\right)$$

3-m forward $= \text{Bid}\left(\dfrac{\text{Rs.}}{€}\right) = 43.90 \times \dfrac{1}{\text{Ask}\left(\frac{€}{\$}\right)} = 43.90 \times \dfrac{1}{1.04} = 42.21$

Hence the bank will buy Euro @ 42.21. Therefore, rupees realized by Jupiter will be 42.21 × 1 million = Rs. 42.21 million.

39. In September 2002, Multi Industries Inc., assessed the expected future spot rate for pounds for March 2003 on the following basis.

$1.30   Probability 0.15

$1.35   Probability 0.20

$1.40   Probability 0.25

$1.45   Probability 0.20

$1.50   Probability 0.20

a. What is the likely spot rate in March 2003?

b. If six months forward rate is $1.40 to one Pound Sterling, should the firm sell forward the dollar receivables due in March 2003?

Solution :

a. The likely spot rate

= 0.15*1.30 + 0.2*1.35 + 0.25*1.40 + 0.20*1.45 + 0.20*1.5

= $ 1.4050

b. The firm is to receive dollars in March 2003, i.e. it will buy pounds in March 2003, by selling dollars. Thus we need a $ quote. Given £1 = $ 1.4050

⇔ $1 = £1/1.4050 = £0.7117 & similarly forward rate ⇔ $1 = £1/1.4 = £0.7143. By selling $ forward, the firm would get more £. Hence the firm should sell forward.

40. **The following quotes are available.**

Spot ($/Euro)   0.8385/0.8391

3-m swap points   20/30

Spot ($/Pound)   1.4548/1 .4554

3-m swap points   35/25

Find the 3-m (€/£) outright forward rates.

Solution:

Given $\$/\euro = 0.8385/0.8391$ 3m fwd. $= 0.8405/0.8421$

[Swap points ascending order $\rightarrow$ Hence, add to find forward rates]

          $\$/£ = 1.4548/1.4554$ 3m fwd. $= 1.4513/1.4529$

[Swap points descending order $\rightarrow$ Hence, deduct to find forward rates]

To find $\euro/£$ (3m outright forward rates)

We know that $\text{Bid}\left(\dfrac{\euro}{£}\right) = \text{Bid}\left(\dfrac{\euro}{\$}\right) \times \text{Bid}\left(\dfrac{\$}{£}\right)$

We do not have a quote of $\euro/\$$, instead we have $\$/\euro$. Hence we use

$$\text{Bid}\left(\frac{\euro}{£}\right) = \frac{1}{\text{Ask}\left(\dfrac{\$}{£}\right)}$$

Substituting, the values we get Bid rate for $\euro/£ = 1/0.8421 \times 1.4513 = 1.7234$

Similarly $\text{Ask}\left(\dfrac{\euro}{£}\right) = \dfrac{1}{\text{Bid}\left(\dfrac{\$}{£}\right)} \times \text{Ask}\left(\dfrac{\$}{£}\right) = 1/0.8405 \times 1.4529 = 1.7286$

We thus get the 3m outright forward ($\euro/£$) quote as $= 1.7234/1.7286$

41. You are given the following information about current rates for Sterling Spot & Forward.

	Spot	**1-month Forward**	**3-month Forward**
Canadian Dollar	1.8630-0.8640	30-20 cents Premium	0.90-80 Premium
Belgian Franc	72.20-30	10-20 cents Discount	45-55 Discount
Danish Kroner	13.01-02	44 - 45 5/8 Discount	18 3/8 - $19\frac{3}{4}$ % Discount
German DM	3.065-075	2 - 1.5 Premium	5.5-5.0 Premium

Calculate the cost or value in sterling to a customer, who wishes to a) Buy Canadian dollars 25000 spot

b) Buy Belgian francs 75000 three months forward

c) Sell Danish Kroner 20000 three months forward

d) Sell DM 6000 one month forward

Solution :

a.   To buy 25000 Canadian Dollars (CD) Spot

First get a quote in CD.

1 CD = 1/1.8630 = £0.5368

Therefore to get 25000 CD customer pays = 25000×0.5368 = £13420

b. To buy 75000 Belgian Francs (BF) 3m fwd.

First get a quote in BF.

Spot rate (BF/£)   72.20/72.30

3m fwd. rate (BF/£) 72.65/72.85 [Swap low/high, ascending order, hence add]

3m fwd. rate (£/BF) 0.0137/0.0138 [1 BF = 1/72.65 = £0.0138] $\left(\dfrac{1}{72.85} \Big/ \dfrac{1}{72.65}\right)$

Therefore to get 75000 BF customer pays = 75000*0.0137 = £ 1027.50

c. Sell Danish Kroner (DK) 20000 three months forward

Spot rate (DK/£)   13.01/13.02

1m fwd. rate (DK/£) 13.1938/13.2175 [Swap 18.375/19.75, Asc. order, hence add]

1m fwd. rate (£/DK) 0.0757/0.0758   [1 DK = 1/13.1938 = £0.0758]

Therefore to sell 20000 DK customer gets = 20,000×0.0757 = £ 1514

d. Sell DM 6000 one months forward

Spot rate (DM/£)   3.065/3.075

1m fwd. rate (DM/£) 3.045/3.060 [Swap 2.0/1.5, Desc. order, hence subtract]

1m fwd. rate (£/DM) 0.3268/0.3284   [1 DM = 1/3.045 = £0.3284]

Therefore to sell 6000 DM customer gets = 6000×0.3268 = £ 1960.8

42. An Indian customer who has imported equipment from Germany has approached a Bank for booking a forward Euro contract. The delivery is expected six months from now. The following rates are quoted.

($/Euro) Spot   0.8453/0.8457

6-m swap   15/20

Rs./$ Spot   46.47/46.57

6-m swap   20/30

What rate the Bank will quote if it needs a margin of 0.5%?

Solution :

First calculate outright forward rates :

$/ 6m Forward Rates:

Bid rate   = 0.8453+0.0015=0.8468

Offer rate   = 0.8457+0.0020=0.8477

$/Rs. 6m Forward rates

Bid rate   = 46.47+0.20=46.67

Offer rate   = 46.57+0.30=46.87

The customer needs ∈ to pay for imports. He would purchase euros. Therefore he needs a quote of Euro in Rupee terms. We therefore need to find only ask quote.

(Rs./∈) = (Rs./$) × ($/∈) = 0.8477 × 46.87

The Bank would quote Rs. 39.73 + 0.5% = Rs. 39.93/∈

43. Consider the following rates :

Spot   Rs./$ 42.17/42.59

                              Rs./DM 24.61/25.10

3-m forward   Rs./$ 43.15/43.60

                              Rs./DM 25.36/25.90

a.   From these rates calculate the spot and forward DM/$ rates.

b.   What are the upper and lower boundaries for the DM/$ quotations.

Solution :

Given :

Spot   Rs./$ 42.17/42.59

              Rs./DM 24.61/25.10

3-m forward Rs./$ 43.15/43.60

              Rs./DM 25.36/25.90

a.   Calculation of Spot DM/$ rates.

We know that $\text{Bid}\left(\dfrac{DM}{\$}\right) = \text{Bid}\left(\dfrac{DM}{Rs.}\right) \times \text{Bid}\left(\dfrac{Rs.}{\$}\right)$

We do not have a quote of DM/Rs., instead we have Rs./DM. Hence we use

$$\text{Bid}\left(\frac{DM}{\$}\right) = \frac{1}{\text{Ask}\left(\dfrac{Rs.}{DM}\right)}$$

Substituting, the values we get Bid rate for DM/$ = 1/25.10 × 42.17 = 1.6800

Similarly $\text{Ask}\left(\dfrac{DM}{\$}\right) = \text{Ask}\left(\dfrac{Rs.}{\$}\right) \times \dfrac{1}{\text{Bid}\left(\dfrac{Rs.}{DM}\right)} = 42.59 \times 1/24.61 = 1.7365$

We thus get the (DM/$) quote as = 1.6800/1.7305

Calculation of 3m Forward DM/$ rates

Similarly we get 3m Forward quote for (DM/$) as 1.6660/1.7192

b.   Upper boundary for spot rate is 1.7305

Lower boundary for spot rate is 1.6800

Upper boundary for forward rate is 1.7192

Lower boundary for forward rate is 1.6660

Study Note - 9

SOURCES OF INTERNATIONAL FINANCE

9.1 Raising Funds in Foreign Markets and Investment in Foreign Markets

This Section includes :

- **Need for Foreign Capital**
- **Official Foreign Source of Finance**
- **Non Official Foreign Source Of Finance**

INTRODUCTION :

Most countries of the world which raced to the path of economic and industrial development had to depend on foreign capital to some extent. Under developed countries like India have to depend on foreign capital for financing their development programmes as they suffer from low level of income and low level of capital accumulation. The degree of dependence, however, varies from country to country depending upon its level of mobilization of domestic capital, technology development, attitude of the government, etc. But the fact cannot be denied that foreign capital contributes in many ways to the process of rapid economic growth and industrialization.

NEED FOR FOREIGN CAPITAL :

The need for foreign capital in a developing country like India arises on account of the following:

1. Inadequacy of Domestic Capital : In view of the inadequacy of domestic capital, foreign capital is needed to meet the huge requirements of development projects in the path of rapid economic development and inustrialisation.

2. The Technology Gap : As compared to the advanced countries there is a lot of technology gap which necessitates import of foreign technology. Such technology usually comes along with foreign capital in the form of private foreign investment or foreign collaborations. Thus, there is utmost need of foreign capital.

3. The Initial Risk : Due to lack of experience, expertise and heavy initial risk, there is always a lack of flow of domestic capital into lines of production. The foreign capital taking initial risk stimulates the flow of domestic capital and stock entrepreneurship.

4. Development of Basic Infrastructure : There is also a lack of basic infrastructure which is very essential for the economic development of the underdeveloped countries. Foreign capital helps in the development of infrastructural facilities such as transport, communication, power etc.

5. Balance of Payment Support : During the process of economic development, the underdeveloped countries usually face a crisis of balance of payments due to heavy imports of capital goods, technical know-how, spare parts and even industrial raw materials. Thus, foreign capital is needed to face the crisis during this period.

```
                          Foreign Capital (FC)
                                  |
          ┌───────────────────────┴───────────────────────┐
          ↓                                                 ↓
     Official (FC)                                Non-Official / Private (FC)
          |
    ┌─────┴─────────┐                              → Foreign Direct Investment
    ↓               ↓
Bilateral Government   International               → Portfolio
Funding Arrangements
                                                   → Operations of MNCS
    → Loans and Advances    Financial
                            Institutions           → Deposits and
    → Foreign Aid                                     investments by NRI

    → Grants / Subsidies                           → Investments by FIIs

    → Concessions                                  → Euro Issues

                                                   → ECBs
```
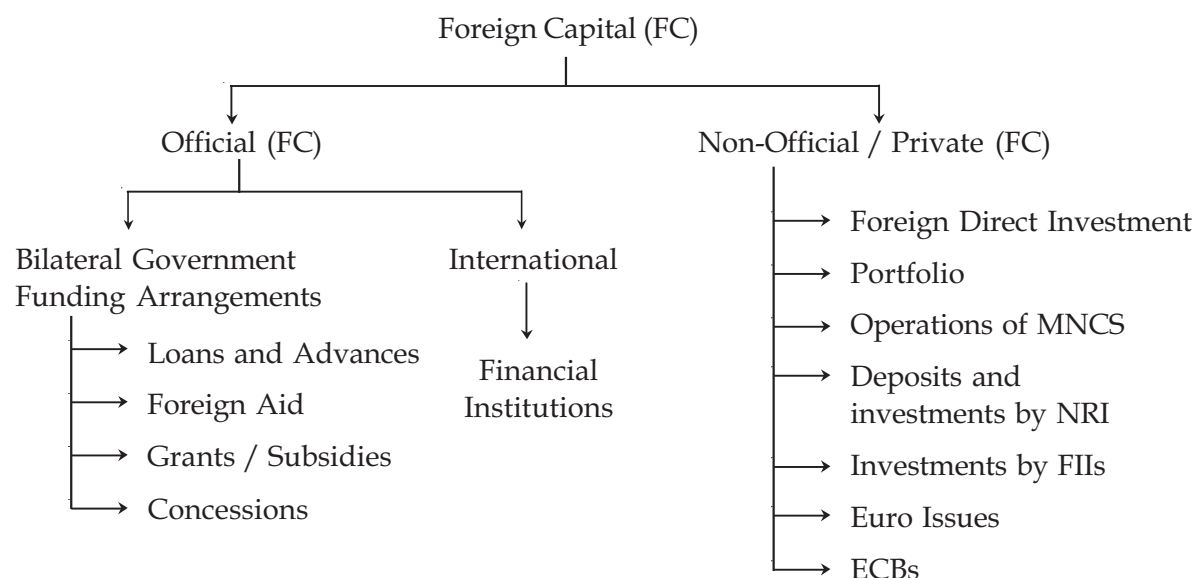
The above pictorial presentation shows the divisions of foreign capital

OFFICIAL FOREIGN SOURCE OF FINANCE :

1. Foreign Collaboration: In India joint participation of foreign and domestic capital has been quite common in recent years. Foreign collaboration could be either in the form of joint participation between private firms, or between foreign firms and Indian Government, or between foreign governments and Indian Government.

2. Bilateral Government Funding Arrangement: Generally, advanced countries provide aid in the form of loans and advances, grants, subsidies to governments of under-developed and developing countries. The aid is provided usually for financing government and public sector projects. Funds are provided at concessional terms in respect of cost (interest), maturity, and repayment schedule.

3. NRI Deposits and Investments: Non-resident Indian have always been making a contribution in Indian economy. Government has been making efforts to encourage their deposits and investments. Various schemes have been devised which ensure higher returns; procedures have been simplified to attract investments in primary and secondary market. Tax incentives are given on interest earned and dividends received by NRIs.

4. Loans from International Financial Institutions : International Bank for Reconstruction and Development (IBRD), International Monetary Fund (IMF), Asian Development Bank (ADB), and World Bank have been the major source of external finance to India.

5. External Commercial Borrowing (CEB) : Our country has also been obtaining foreign capital in the form of external commercial borrowings from agencies like US EXIM Bank, Japanese EXIM Bank, ECGC of UK, etc.

NON OFFICIAL FOREIGN SOURCE OF FINANCE :

Foreign Direct Investment (FDI)

Foreign direct investment is one of the most important sources of foreign investment in developing countries like India. It is seen as a means to supplement domestic investment for achieving a higher level of growth and development. FDI is permitted under the forms of investments.

1. Through financial collaborations / capital / equity participation;

2. Through Joint ventures and technical collaborations;

3. Through capital markets (Euro Issues);

4. Through private placements or preferential allotment.

Capital participation / financial collaboration refers to the foreign partner's stake in the capital of the receiving country's companies while technical collaboration refers to such facilities provided by foreign partner as licencing, trade marks and patents (against which he gets lump sum fee or royalty payments for specified period); technical services etc.

From investors' point of view, the FDI inflows can be classified into the following groups.

(a)   Market seeking :   The investors are attracted by the size of the local market, which depends on the income of the country and its growth rate.

(b)   Lower cost : Investors are more cost-conscious. They are influenced by infrastructure facilities and labour costs.

(c)   Location and other factors : Technological status of a country, brand name, goodwill enjoyed by the local firms, favourable location, openness of the economy, policies of the government and intellectual property protection granted by the government are some of the factors that attract investors to undertake investments.

Factors that attracts FDIs in India

The following factors can be held responsible for the flow of foreign direct investments in India:

1. India has a well developed network of banking and financial institutions and an organized capital market open to foreign institutional investors that attracts them to undertake investments.

2. India has vast potential of young entrepreneurs in the private sector. India skills and competence is used as a base for carrying out production activities and export to neighbour countries.

3. For the last few years there has been political stability in the country.

4. India enjoys good reputation among other countries as to honouring of its commitments about repayment obligations, remittance of dividends etc.

5. India has vast potential of unskilled labour available at cheap rates as compared to other countries, and vast natural resources that attract foreign investors.

Factors that Discourage FDIs

Factors that discourage foreign investors to undertake investments in India include:

(i)   High rates of taxation;

(ii)   Lack of infrastructure facilities;

(iii)   Favouritism in the selection of investment;

(iv)   Complicated legal framework of rules, regulations procedures for foreign direct investments into India;

(v)   Lack of transparency.

Investments by Foreign Institutional Investors (FIIs)

SEBI (Foreign Institutional Investors) Regulations, 1995, define Foreign Institutional Investors as an institution established or incorporated outside India which proposes to make investment in India in securities. The regulations make it mandatory for FIIs to seek registration with SEBI before operating in Indian securities market. Before granting certificate of registration, the applicant's track record, professional competence, financial soundness experience, general reputation of fairness and integration is taken into consideration by SEBI.

Eligibility Criteria

An FII eligible to apply has to be:

1. An institution established or incorporated outside India as a pension fund or mutual fund or investment trust;

2. An asset management company or nominee company or bank or institutional portfolio manager, established or incorporated outside India and proposing to make investments in India on behalf of a broad based fund;

3. A trustee or power of attorney holder established or incorporated outside India and proposing to make investments in India on behalf of broad based funds.

By an amendment in October, 1996, university funds, endowments foundations or charitable trusts or charitable societies were included.

Proprietary funds which are regulated in their home countries were also included under the eligible list of FIIs later in February, 1997.

A certificate for registration once issued is valid for 5 years and can be renewed there after. FIIs are required to obtain permission under the provisions of the FERA, 1973 in order to make investment in India.

Investment Restrictions

FIIs are permitted to invest only in the following securities.

1. Securities in the primary and secondary markets including share, debentures and warrants of companies whether listed or to be listed on a recognized stock exchange in India including OTC exchange of India.

2. Units of schemes floated by domestic mutual funds including UTI;

3. Dated government securities w.e.f. February, 1997;

4. Derivatives trade on a recognized stock exchange;

5. Commercial paper.

FIIs are now permitted to invest in unlisted companies. Transactions in government securities, commercial paper including treasury bills shall be carried as per Reserve Bank of India rules. All investments by FIIs are subject to government of India guidelines. The general obligations and responsibilities of FIIs include appointment of a domestic custodian, appointment of a designated bank, maintenance of proper books of accounts, record, appointment of a compliance officer and submission of information, records or documents as may be required by SEBI.

In case, FII fails to comply with any condition subject to which certificate has been granted or contravenes any of the provisions of the Act then it shall be liable to the penalty of suspension or cancellation of certificate as per SEBI (Procedure for Holding Enquiry Officer and Imposing Penalty) Regulations, 2002.

Government of India guidelines place no restriction on the volume of investment minimum or maximum for the purpose of entry of FIIs in the primary and secondary market and prescribes no lock in period of such investments. Portfolio investments in primary or secondary markets initially were subject to a ceiling of 24% of issued share capital for all the total holdings of all registered FIIs, in any one company. The limit was enhanced to 30% w.e.f. April 1997. In 2001-02 the government raised this limit to 49% w.e.f September, 2001; the level of FDI in various sectors has been raised to 74% or even beyond this in various sectors. The holdings of a single FII in any company is subject to a ceiling of 10% of total issued capital.

NRI Investments In India

Developing countries require more and more investments to accelerate the rate of growth. India has embarked on a plan to industrialise the country to accelerate antipoverty programmes. The liberalization process started since 1991 is to attract more investments from outside the country. Non-Resident Indians have always been making a contribution in Indian economy. The present policy of Indian Government is to amend laws which placed obstacles in attracting foreign investments and simplifying rules and regulations for setting up new undertakings.

Meaning of NRI

Before discussing the gamut of NRI investments, it will be necessary to know who is a Non-resident Indian. The term *Non-resident* is very broad and includes:

(i) Non-resident persons of Indian Nationality and

(ii) Non-resident foreign citizens. Non-resident foreign citizens may further be of two

   Types:

   (a) Non-resident foreign citizens of Indian origin and

   (b) Non-resident foreign citizens of non-Indian origin.

Non-resident Indians have different meaning under Foreign Exchange Regulation Act (FERA), 1973 and Income Tax Act, 1961. It is the nationality and purpose of stay of an individual outside India which is relevant for determining the residential status for FERA whereas period of stay outside India determines the status of a person under Income Tax Act. Non-resident persons of Indian origin are given special treatment in respect of investment in India. They are almost treated at par with non-resident Indian nationals and are collectively referred to as *Non-resident Indians (NRI).*

Non-resident Indians are covered under the following categories:

1. Indian citizens who stay abroad for employment, business or vocation or for other purposes stating their intention to stay abroad for indefinite period;

2. Indian citizens working abroad on assignments with Foreign Government / Government Agencies or International Agencies etc.;

3. Officials of the Central and state Government and public sector undertakings deputed abroad on temporary assignments or posted to their offices abroad.

Modes of NRI Investments

The role of NRI's in Indian economy has been well recognized by the government which has constantly made efforts to encourage their deposits and investments. Government has been devising schemes which give higher returns, providing liberalizations in existing schemes, simplifying procedures and removing bureaucratic bottlenecks. The changes in New Industrial Policy, 1991 are designed to attract significant capital flows into India on a sustained basis. They are also aimed to encourage technology collaborations between Indian and foreign companies.

NRI investments are both direct and indirect. Direct investments are in shares, debentures, other securities, etc. and indirect investments are in the form of mopping up their surplus funds into savings accounts, mutual funds etc. Some of the investment schemes for NRI's are discussed here:

1. Investments in Govt. Securities, UTI Units etc. : NRI's can freely purchase central and state governments securities and units of UTI by either transferring money from foreign countries through normal banking channels or by withdrawing money from their accounts in India. The banks are also allowed to credit interest, dividend, sale and maturity proceeds to the non-resident accounts or through stock exchanges in India provided it is done through authorized dealers.

2. Investment in SBI Bonds and India Development Bonds : State Bank of India issued "NRI Bonds" in 1998 and India Development bonds in 1991 for NRI's. These were close ended schemes and investments are not allowed now in these schemes.

3. Investments in Proprietorship / Partnership Concerns : The Central Government has allowed NRI's to invest by way of capital contribution in any proprietary or partnership concern engaged in any industrial, commercial or trading activity on repatriations basis. The profits accruing to the NRI may be credited to ordinary Non-resident Rupee Account or may be ploughed back in the business itself.

The funds must come through normal banking channels. The business where investment has to be made should not deal in land and immovable property. There is no need to obtain prior approval of Reserve Bank but it can be informed of the details later on.

4. Investment in New Issues of Shares / Debentures : In 1992, NRI's have been allowed to take up or subscribe on non-repatriation basis the shares or convertible debentures issued, whether by public issue or private placement, by a company incorporated in India. They can also be given rights / bonus shares and these certificates can be sent out of India. Any income accruing from such investments or sale price of these securities will be credited to their NRI accounts.

Investments in new issues under the Forty (40) per cent scheme are now allowed on repatriation basis also. NRI's can subscribe to new issues of shares or convertible debentures of any new or existing company with the right of repatriation of the capital invested and income earned thereon, provided the aggregate issue, to non-residents qualify for the facility of repatriation does not exceed 40 per cent of the face value of the new issue. Such investment can be made only in private or public limited companies raising capital for setting up new industrial / manufacturing projects or for expansion or diversification etc. Such investments can also be made in companies engaged in hospitals, hotels, shipping and development of computer software and oil exploration services.

5. Deposits with Companies : Companies can accept deposits from NRI's within the limits prescribed by Reserve Bank of India. The company accepting such deposits will apply for permission to RBI with details of deposits and NRI's will not be required to get separate permission.

6. Investments in Commercial Paper & Mutual Funds : NRI's can invest in Commercial paper issued by Indian Companies in non-repatriation basis. CP issued to NRI's will not be transferable.

They are also allowed to invest in mutual funds floated by private / public sector banks / financial institutions. Such investments can also be made through secondary market. The funds accepting such investments will get an approval from Reserve Bank of India.

7. Investment in Priority Industries : NRI's are permitted to invest with full repatriation benefits upto 100 percent in the issue of equity shares or convertible debentures of a private / public limited Company engaged in or proposing to engage in high priority industries. The investments by NRI's should cover foreign exchange requirements for import of capital goods. Any income out of these investments can be freely remitted except in case of consumer goods industries where the outflow on account of dividend is balanced by export earnings of the company. The proposed project should not be located within 25 K.M. from the periphery of the city have a population of more than 10 lakhs as per 1991 census. It means that government wants to utilize NRI funds for industrializing new areas or under-developed areas.

8. Investment in Other Industries : NRI's can invest in sick industrial units. Such units must be incurring losses for consecutive three years, its shares are selling at a discount for 2 years and financial institutions have formulated rehabilitation plans for such sick units. Such investments are allowed on the following conditions:

(i) Investments can be made either by purchasing equity shares of existing share holders or by subscribing to new issues of such Companies;

(ii) Bulk investment on private placement basis even upto 100 per cent of equity Capital of sick unit.

(iii) The funds should come either as fresh foreign remittance or from NRI accounts;

(iv) The capital brought in will not be repatriated before 5 years.

(v) The sick unit will not be allowed to deal in real estate business or agricultural plantation activities.

9. Investment in Housing & Real Estate Development : NRI's are permitted to invest upto 100 per cent in the new issue of equity shares / convertible debentures of Indian Companies engaged in the following areas:

(i) Development of serviced plots and construction of built up residential premises;

(ii) Real estate covering construction of residential and commercial premises including Business centres and offices;

(iii) Development of township;

(iv) City and region level urban infrastructure including roads bridges;

(v) Manufacturing of building materials;

(vi) Financing of housing development.

A permission from Reserve Bank of India is essential for making investments in above mentioned schemes. Repatriation of original investment is not allowed before 3 years.

The need for NRI investments is realized by the Government of India and that is why it has made a number of schemes for attracting their funds. Various laws have been amended to simplify the procedures for bringing NRI funds into the country. Indian economy needs more and more investments in every activity. Infrastructural investments are inadequate to develop a base for accelerating industrialization. Both direct and indirect investments are allowed to NRI's. They can take part in industrial activity by even investing 100 per cent money in certain areas. On the other hand they can invest in mutual fund schemes and may deposit funds with Commercial banks which too ultimately will be used for productive purposes.

Euro Issues

After the onset of the process of globalization of Indian economy, the govt. thought it imperative to allow the companies in India to raise funds from foreign market in foreign exchange. It may be noted that in case of foreign capital, the foreign exchange is involved, so, it is controlled and regulated by the RBI and the govt. Euro issues are outside the ambit of SEBI. In November 1993, the govt. announced the scheme of issue of securities by Indian companies in capital markets

abroad. This scheme is known as "issue of foreign currency convertible bonds and ordinary shares scheme 1993". The scheme has been reviewed and several amendments have been made in the scheme from time to time.

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│      FCCB       │    │      GDR        │    │      ADR        │
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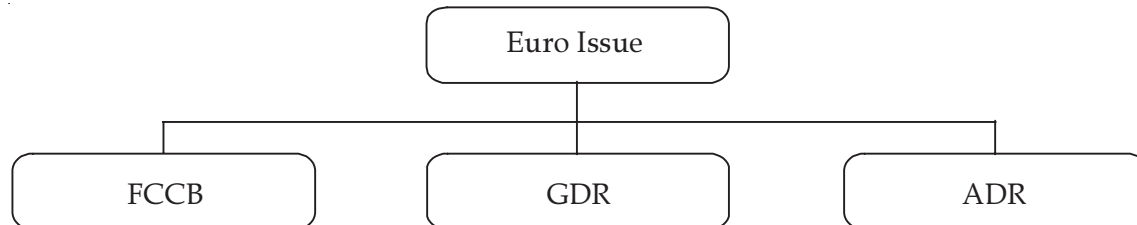
The scheme has permitted Indian companies to two types of securities:

      (a) Foreign currency convertible bonds, and

      (b) Equity shares through depositary receipts.

The regulatory provisions of these securities are as follows:

Foreign Currency Convertible Bonds (FCCBs) : FCCB means bonds issued in accordance with the relevant scheme and subscribed by a non-resident in foreign currency and convertible into depositary receipts or ordinary shares of the issuing company in any manner, either in whole or in part, on the basis of any equity related warrants attached to debt instruments. A company seeking to issue FCCBs should have consistent track record of good performance for a period of three years. The FCCBs are unsecured; carry a fixed rate of interest and an option for conversion into affixed number of equity shares of the issuer company. Interest on redemption price (if conversion option is no exercised) is payable in dollars. Interest rates are very low by Indian domestic standards. FCCBs are denominated in any freely convertible foreign currency, generally in US $.

FCCB has been popular with issuers. Local debt markets can be restrictive with comparatively short maturities and high interest rates. On the other hand, straight equity may cause a dilution in earnings, and certainly dilutions in control, which many share holders, especially major family share holders, would find unacceptable. Thus the low many coupon security which defers share holders dilution for several years in form of FCCB, can be alternative to issuer. Foreign investor also prefer FCCBs because of dollar denominated servicing, the conversion option and the arbitrage opportunities presented by conversion of the FCCBs into equity at discount on prevailing market price in India.

The major drawbacks of FCCBs are that the issuing company cannot plan capital structure as it is not assured of conversion of FCCBs. Moreover, the projections for cash outflows at the time of maturity cannot be made. In addition, FCCBs would result in creation of external debt for the country, as there would be foreign exchange outflow from the country if conversion option is not exercised by the investors. Some other regulations of FCCBs are

(1) Interest payment on bond, until the conversion option is exercised, shall be subjected to TDS @ 10%

(2) Conversion of FCCBs into shares shall not give rise to capital gain in India.

(3) Transfer of FCCBs shall not give rise to capital gain in India.

Depository Receipts (DRs): A DR means any instrument in the form of depository receipt or certificate created by the overseas depository bank outside India and issued to non-resident investors against the issue of ordinary shares. In depository receipt, negotiable instrument evidencing a fixed number of equity shares of the issuing company generally denominated in U.S. $. DRs are commonly used by the company which sells their securities in international market and expanding their share holdings abroad. These securities are listed and traded in international stock exchanges. These can be either American depository receipt (ADR) or global depositary receipt (GDR). ADRs are issued in case the funds are raised through retail market in United States. In case of GDR issue, the invitation to participate in the issue cannot be extended to retail US investors.

While DR is denominated in any freely convertible foreign currency, generally in US dollars are issued by the depository in the international market, the underlying shares denominated in Indian rupees are issued in the domestic market by the issuing company. These shares are issued by the company are custodized in the home market with the local bank called custodian.

An investor has an option to convert the DR into fixed number of equity shares of Issuer Company after a cooling period of 45 days. He can do so by advising the depository. The depository in turn, will instruct the custodian about cancellation of DR and release the correspondence shares infavour of non resident investor, for being sold directly on behalf of the non-resident or being transferred in books of accounts of the issuing company in the name of the non resident. Once the underlying shares are released, the same cannot be recustodized. In addition, shares acquired in open market cannot be custodized. Until such conversion the DRs, which are negotiable, are traded on an overseas stock exchange, entitled for dividend in dollar but that carry no voting rights, yield rupee dividend and are tradable on Indian stock exchanges like another equity shares. Some other regulatory provisions are:

     i.   DR may be issued for one or more underlying shares.

    ii.   Dividend on shares will be subjected to TDS @10%.

  iii.   Transfer or trading of DR outside India will not give rise to any capital gain in India.

Some of the provisions relating to euro issues are as follows:

1. Euro issue shall be considered as direct foreign investment in the issuing company.

2. There is no limit on the number of euro issues to be floated by a company in one year.

3. Investment of proceeds of euro issues cannot be made in stock market and real estate. However, the funds can be used for prepayment of scheduled payment of external commercial borrowings.

4. Within the framework, GDR raising companies will be allowed full flexibility in deploying the proceeds. Up to maximization of 25% of total proceeds may be used for general corporate restructuring including working capital requirements of the company raising the GDR.

5. The company can be required to specify the proposed end uses of the issue proceeds at the time of making their application, and will be required to submit the quarterly statement of utilization of funds for the approved end uses, duly certified by the auditors.

6. Currently, companies are permitted to access foreign capital market through foreign currency convertible bonds for (*i*) Restructuring of external debt which helps to lengthen maturity and soften terms, and (*ii*) For end use of funds which confirm to the norms prescribed by the govt. for external commercial borrowings (ECBs) from time to time. In addition to these, not more than 25% of FCCB proceeds may be used for general corporate restructuring including working capita requirements.

7. Companies will not permit to issue warrants along with their euro issue.

8. Companies may retain the proceeds abroad or may remit into India in anticipation of the use of funds for approved end uses.

9. Both the in-principle and final approvals will be valid for three months from the date of their respective issue.

Considering the funding requirements of unlisted companies, it has been decided to permit all unlisted companies to float Euro/ADR issue provided they fulfill the three year track record eligibility requirement. These unlisted companies floating GDR/ADR/FCCB issues would, however, need to comply with the standard listing requirement of listing on the domestic stock exchange within 3 years of having started making profit.

In February 2002, the government has allowed **two-way fungibility** of shares issued under the euro issues. Two-way fungibility means reissue of ADR/GDR in place of shares which were issued by way of conversions of ADR/GDR. Some of the regulatory provisions relating to two way fungibility are:

a) Re-issuance of ADR/GDR would be permitted to the extent of ADRs/GDRs which have been redeemed into underlying shares.

b) Transaction would be effected through SEBI registered brokers and under the RBI guidelines.

c) The re-issuance of ADR/GDR will takes place through custodian.

d) For creation of ADR/GDR the Indian broker will purchase the shares from stock exchanges, for which money will come from overseas buyer.

e) Overseas depositor will issue ADR/GDR to the foreign investors.

f) A monthly report of two way fungibility is to be submitted to the RBI and SEBI.

g) The two-way fungibility process is demand driven and the company is not involved in it. Since 1994, several companies are have raised foreign capital through Euro issues (both FCCB and DR). Some of these companies are Reliance, Dr. Reddy's lab, Indian Rayon, etc.

Benefits of Euro-issues to Issuing Company

- International capital market is very large and liquid, and can absorb issues larger size.

- Better corporate image of issuing company both in India and abroad among bankers, customers, etc.

- Proceeds can be used for import and acquisition abroad.

- It will broaden the shareholders base and enhance investors quality.

- It normally offers better comparative share value.

- The cost of raising equity funds from international market is generally lower than the cost domestic issues.

- It implies acceptance by sophisticated western investors which in turn would help to enhance the image of the company and its product internationally.

Benefits of Euro-Issues to the Investors

- Euro issues are allowed to be issued only by the companies with proven track record.

- It is listed and traded in international stock exchanges in the dematerialized form and hence is free from delivery and settlement problems.

- It is generally denominated in US Dollars and hence reduces the foreign exchange risk.

- Dividend and interest on investment in Euro issues instruments may carry concessional tax rates.

- Market for most of the script is more liquid and hence facilitates faster entry and exit.

- Investors in Euro-issues are not required to comply with a large number of complex formalities and regulations normally required for investment through domestic stock exchanges.

Issue of ADRs by an Indian Company: An Indian company may think of floating an ADR issue primarily with an intention of getting its shares listed at NASDAQ or New York Stock Exchange. ADR issue should be attempted in two phases:

i.   **Preparing for the ADR issue:** Before a company goes for issue of ADRs, it has to adequately and systematically prepare for it. It has to prepare the business plan for which the funds are required. Next, it should get fair valuation of its equity shares. The current market price, projected earnings and intrinsic worth will help in this matter. The company has to prepare and redraft its financial statements for last at least 3 years as per US GAAP.

It has to empanel and select merchant bankers in the US capital market. These would include Overseas Depository, Legal Advisors and Certified Public Accountants. The company then has to obtain necessary approval from the government. Thereafter, it has to get itself registered with the Securities Exchange Commission of US and the NYSE or NASDAQ where the ADRs are planned to be listed. Then the company can proceed with the offer of ADRs to the investors for which Roadshows. Presentations, conference, etc. may be planned.

ii. **Offering the ADRs:** The ADRs are issued through the depository mechanism. The subscription list will be kept open as per the SEC regulations. If the company has opted for green shoe option, it has to prepare for this also. Once the subscriptions are received in the designated overseas banks, the company shall create shares and will hand over these shares to the custodian in India. The depository shall issue ADRs to the foreign investors against the underlying shares.

The foreign investors can transact in the ADRs either by selling at the stock exchange, or can get the underlying shares handing over the ADRs to the depository. These underlying shares can then be sold at the recognized stock exchange in India.

9.2 Forward (Interest) Rate Agreements – FRAS

This Section includes :

- **Forward Rate Agreements (FRA)**
- **Interest Rate Guarantee (IRG)**

INTRODUCTION :

The foreign exchange market is undoubtedly the world's largest financial market. It is a market where one country's currency is traded for another's. Most of the trading takes place in few currencies. Viz. US Dollar, Euro, Great Britain Pound, Japanese Yen, the four major currencies of the world.

The foreign exchange market is an over the counter market, so there is no single location where the trader's get together. Instead market participants are located in major commercial and investment banks around the world.

FORWARD RATE AGREEMENTS (FRA) :

Forward contracts helps the company to freeze the rate at which the currency will be bought or sold and the forward rate agreement (FRA) freezes the rate at which interest will be paid on a prospective borrowing arrangement. In other words, FRA is an agreement to borrow or to lend a sum of money in the future, at any interest rate, which is fixed at the time the arrangement is made.

For example : A forward rate agreement is entered into today under which X Ltd will borrow from the bank Rs.100 crores one year from today at 10%. Like any forward contract, both parties are obliged to contract.

Advantages

It protects the borrower from adverse movements in market rates of interest. Incidentally, on the date of entering into the FRA there may or may not exist an underlying loan. Three situations are contemplated :

a. You don't have an existing loan. You go to a banker indicating that you would like to borrow Rs.100 crores two years form today. You want to freeze the rate. You enter into an FRA for either a fixed rate or a floating rate.

b. You have an existing loan with a bank contracted at a certain fixed rate for the duration of the loan. In this case, FRA cannot be used as hedging a tool to freeze interest rate since the rate is already a frozen fixed rate.

c. You have an existing loan with a bank contracted at a floating rate. You could get into a FRA under which say two years from today onwards you would have a fixed rate to say 9%.

On the specified date if the originally contracted rate turns out to be different from the FRA rate, the differential will have to be received or paid. If actual original rate is higher than what is agreed upon under FRA, the bank compensates the borrower. On the other hand, if the actual original rate at the specified future date is lower than what is agreed upon under FRA the borrower is required to pay the differential.

INTEREST RATE GUARANTEES (IRG) :

Interest Rate guarantees are true options in that they hedge the company against adverse interest rate movements, but allow it to take advantage of favorable movements. In taking a decision on whether to use IRG or otherwise, cost in respect of other alternatives, such as Futures Contracts, is also taken into account, and the most favorable alternative, which leads to the lowest cost, is chosen.

Your firm will have $1,000,000 in 3 months' time, for a 6-month period. Nobody is sure what interest rates will prevail in the future. Some analyst's think rates will increase, others feel they will fall. You want to protect your firm against the risk of a reduced return on your funds. You can use the Forward-Rate Agreements to protect yourself, but you know that if you use Forward-Rate Agreements now you will give up the possibility of benefiting from higher interest rates. In these circumstances, interest-rate guarantee products can be very useful. An Interest-Rate Guarantee is a product, which can be very useful in these circumstances. Basically, it is an option on a Forward-Rate Agreement. It allows you a period of time during which you have the right to buy a Forward-Rate Agreement at a set price. The guarantee protects you against a fall in interest rates while giving you the freedom to enjoy a better return if rates increase. If you want this guarantee you will need to pay a higher premium.

Illustration

Suppose you will have a deposit of $1,000,000 for a 6-month period beginning in 3 months' time. You want to protect your firm against lower interest rates and guarantee a minimum return of 5%. You can buy an Interest-Rate Guarantee at this rate of 5%. Let us see how the option would work.

Examples

- In 3 months' time the 6-month Libor sets at 4.5% you use your Interest-Rate Guarantee and will receive a compensation for the 0.5% difference in interest rates so that your 5% return is protected.

- In 3 months' time the 6-month Libor sets at 5.5%. You choose not to use your guarantee and instead you will deposit your funds at the higher rate. In these circumstances the Interest-Rate Guarantee protected you against lower interest rates and also allowed you to take advantage of the rise in interest rates.

The benefits

The guarantee will give you full protection against falling interest rates.

The guarantee will give you freedom to benefit if rates increase.

If you decide that you do not need the guarantee, you can sell it back

Features

- You can get an Interest-Rate Guarantee whenever you need once customized to your requirement.

- Interest rate guarantees are available for all major currencies and different maturities

- One can get Interest-Rate Guarantees from a bank other than the one who holds the cash. Interest-Rate Guarantee can be used for any cash held or expected to have.

The price of your Interest-Rate Guarantee will depend on

- the guaranteed rate;

- how long you want the Option for; and

- how often interest rates are changing.

 Interest rate Guarantee hedges the interest rate for a single period of up to one year. Guarantee commission paid to the guarantor is comparable to option premium.

The comparison between Forward Rate Agreement and Interest Rate Guarantee are

- FRA covers the period which is mutually agreed by the parties of the contract, but in IRG covers only a fixed period generally one year.

- IRG provides protect from one side i.e. adverse movement of interest rates. In case of FRA, it covers both adverse and favorable movements. It simply hedges the risk.

- FRA is similar to Forward contract and IRG is an option contract.

9.3 Exposures in International Finance

This Section includes :

- **Transaction Exposure**
- **Translation Exposure**
- **Economic Exposure**
- **Political Exposure**

INTRODUCTION :

The exposure indicates a situation of being open or being vulnerable to risks. As soon as a firm enter into transactions dealings involve foreign currency, it is exposed to foreign exchange risk. The dealings may be related to sale or purchase of goods and services, overseas investments or financing its operations in foreign currencies by issue of shares/debentures/loans to foreign investors.

The exposure of a firm to variations in exchange rates, may be of four types :

i.   Transaction Exposure

ii.   Translation Exposure

iii. Economic Exposure

iv.   Political Exposure

(i)   TRANSACTION EXPOSURE :

Usually there is a time gap between sale of goods and services and the receipt and payment. During this period the exchange rates may change and there may arise a risk due to exchange rates. This risk is known as transaction exposure. A transaction exposure occurs when a value of future transaction, though known with certainty, is dominated in some currency other than the domestic currency. In such cases, the monetary value is fixed in terms of foreign currency at the time of agreement which is completed at a later date. For example, an Indian exporter is to receive payment in Roubles 90 days time for an export made today. His receipt in Roubles is fixed and certain but as far as the revalue is concerned, it is uncertain and will depend upon the exchange rate prevailing at the time of receipt. All fixed money value subjected to transaction exposure. The transaction exposure look at the effects of fluctuations denominated in foreign currency. It may be noted that if the payment is denominated in foreign currency, then the importer carries the risk of transaction exposure. However, if the payment in domestic currency of the importer then the risk of transaction exposure goes with the exporter. So, the receipts and payments denominated in foreign currency have transaction exposure. If receipts (denominated in foreign currency) are more than payment (denominated in foreign currency), the decrease in value of foreign currency will cause exchange loss and appreciation in the value of foreign currency will bring exchange gains. However, if receipts are lower than the payments, decrease in value of currency will create gain and appreciation will create losses.

(ii) TRANSLATION EXPOSURE :

Translation exposure is the profit or loss associated with converting foreign currency denominated assets / liabilities (also income and expenses) in reporting currency. It emerges when for the limited purpose of financial reporting, items of income, expenses, assets & liabilities denominated in foreign currency translated into home currency, i.e., reporting currency. The effect of such translation need not necessarily affect the cash flows of an entity. [Risk under this category relates to the accounting treatment of changes in exchange rates for reporting purposes and is some what technical. And it is governed by accounting standard -11 revised and issued by the Accounting Standard Board, and is dealt with there elaborately.

(iii) ECONOMIC EXPOSURE :

When an exchange rate changes, one currency depreciates and the importers of that country would pay more for the current transactions. This is known as transaction exposure. The other effect of the change in exchange rate would be that goods will be dearer and customers have to pay more for the same product. This would affect the future cash flows by affecting the sales and competitiveness.

In case, the currency of the exporter's country depreciates, the exporter stands to gain in terms of current transaction. The goods /services will become cheaper relative to competing countries and there exists a possibility of making increased sales and profits. This is known as the economic exposure of the firm.

The economic value of an asset, or collection of assets, is the present value of the future cash flows that the asset would generate. For a firm, the economic value is the present value of the future cash flows. The economic exposure refers to the profitability that the changes in foreign exchange rate will affect the value of the firm. Since the intrinsic value of the firm is equal to sum of the present values of future cash flows discounted at an appropriate rate of return, the risk contained in economic exposure requires a determination of the effect of changes in exchange rates on each of the expected future cash flows.

The value of the foreign assets or foreign subsidiary is affected not only by the business risk but also by the exchange rate risks. The value of the foreign operation at any time depends upon the future cash flows, expected exchange rate and the appropriate discount rate to be applied to find out the present values.

Economic exposure is a broader and more subjective concept than the transaction and translation exposure because it involves potential effects of changes in exchange rates on all operation of the firm. So, the measurement of economic exposure requires that a detailed analysis of the effects of exchange rate changes should be made.

(iv) POLITICAL EXPOSURE :

Political risk refers to consequences that political activities in a country may have on the value of a firm's overseas operations.

Explanation: while political risks can cause either a negative or positive effect on the value of the firm. We confine ourselves to adverse effects, on any firm operating in a foreign market.

Political risk includes :

- Discrimination against foreign business.

- Compulsory acquisition of properties of government.

- Boycott of products

- Rules specifying the use of labour and materials, or prices setting constraints.

- Exchange controls-limitations on the extent to which a country's currency can be used to transfer funds or restrictions on the conversion of currency into other currencies.

- Tax regulations biased against foreign investment, or foreign operations.

The link between transactions or events attributable to political risk, and change in exchange rate, is rather week. Nevertheless, such risks associated with operations in a foreign center cannot be ignored either.

The political risks are perceived to be high in foreign country, does not necessarily follow that a company should refrain from investing in a country, if the project returns are large enough to justify taking on that risk. The bottom line is- assess the risk- reward ratio and take decision.

9.4 Parity Theorems

This Section includes :

- **Theory of Purchasing Power Parity (PPP)**
- **Theory of Interest Rate Parity (IRP)**
- **International Fisher Effect (IFE)**

INTRODUCTION :

Foreign exchange includes Foreign Currency, Drafts, Bills, Letters of credit and travellers cheques that are denominated and eventually payable in foreign currency. Exchange rate is the price of foreign currency expressed in terms of local currency. The factors influencing rates are the purchasing power parity (inflation). The differences between two countries, vis-a-vis inflation and interest are addressed and suggested means are expressed to bring an equilibrium.

THEORY OF PURCHASING POWER PARITY (PPP) :

This theory was enunciated by Gustav Cassel. Purchasing power of a currency is determined by the amount of goods and services that can be purchased with one unit of that currency. If there is more than one currency, it is fair and equitable that the exchange rate between these currencies provides the same purchasing power for each currency. This is referred to as purchasing power parity.

It is ideal if the existing exchange rate is in tune with this cardinal principle of purchasing power parity. On the contrary, if the existing exchange rate is such that purchasing power parity does not exist in economic terms, it is a situation of disequilibrium. It is expected that the exchange rate between the two currencies conform eventually to purchasing power parity.

Likewise, if the rate of inflation is different in two countries, the floating exchange rate should accordingly vary to reflect that difference. Let us consider two countries, A and B. The rate of inflation in the country A is higher than that in the country B. As a result, imports of the country A increases since the price of foreign goods tend to be lower. Similarly exports from the country A decreases since the prices of its goods appear to be higher to foreigners (residents of country B included). This situation cannot persist for long. In consequence, the currency of country A will depreciate with respect to that of the country B.

If i_h and i_f are the inflation rates in the home country and the foreign country; and ER_o is the value in terms of home currency for one unit of foreign currency at the beginning of the given period and ER_t is the value in terms of home currency at the end of the period,

then $\dfrac{ER_t}{ER_0} = \dfrac{(1+i_n)^t}{(1+i_f)^t}$

Change in the exchange rate $= \dfrac{(1+i_n)}{(1+i_f)}$

Criticism of the PPP Theory

Conceptually, this theory is sound. However, there are a number of recognized factors that prevent this theory from determining exchanges rates, in practice. Some of the major factors in this regard are:

1. Government intervention, directly in the exchange markets or indirectly through trade restrictions;

2. Speculation in the exchange market;

3. Structural changes in the economy of the countries;

4. Continuation of long-term flows in spite of the disequilibrium between purchasing power parity and exchange rates.

Another criticism leveled against this theory is that the rate of inflation or the relevant price level indices are not well defined. Questions pertaining to what constitutes an appropriate sample and weight assigned to each commodity are not satisfactorily answered. For example, should the sample represent all the goods and services, or only those that are traded internationally?

The theory takes into account only the movement of goods and services and not that of capital. In operational terms, it is concerned only with the current account segment of the balance of payment and not with the total **BOP.**

Above all, this theory ignores the fact that a currency may be an instrument of payment by other countries (e.g. US dollar). In this situation the exchange rate may evolve in a manner that has nothing to do with the price levels of the country (i.e. the USA).

The PPP theory can be considered as an ideal theory to determine exchange rates in specific situations, such as high inflation or monetary disturbances. In such situations, the response to individuals to changes in value of real and monetary assets can be expected to be strong and the exchange rate prediction by PPP theory may turn out to be realistic.

Absolute Purchasing Power Parity : A theory which states that the exchanqe rate between one currency and another is in equilibrium when their domestic purchasing powers at that rate'of exchange are equivalent. In short, what this means is that bundle of goods should cost the same in India and the United States once you take the exchange rate into account. To see why, we'll use an example.

First suppose that one Australian Dollar (AUD) is currently selling for 25 Indian Rupees (INR) on the exchange rate market. In Australia cricket bats sell for AUD 40 while in India they sell for only Rs.800. Since 1 AUD = Rs.25, then while the bat costs AUD 40 if we buy it in Australia, it costs only AUD 32 if we buy it in India. Clearly there's an advantage to buying the bat in India, so consumers are much better off going to India to buy their bats. If consumers decide to do this, we should expect to see three things happen :

1. Australian consumers would buy Indian Rupees in order to buy cricket bats in India. So they go to an exchange rate office and sell their Australian Dollars and buy Indian Rupees. This will cause the Indian Rupee to become more valuable relative to the Australian Dollar.

2. The demand for cricket bats sold in Australia decreases, so the price Australian retailers charge goes down.

3. The demand for cricket bats sold in India increases, so the price Indian retailers charge goes up.

Eventually these three factors should cause the exchange rates and the prices in the two countries to change such that we have purchasing power parity. If AUD declines in value to 1 AUD = Rs.23, the price of cricket bats in the AUD goes down to AUD 38 each and the price of cricket bats in India goes up to Rs. 874 each, we will have purchasing power parity. This is because a consumer can spend AUD 38 in Australia for a cricket bat, or he can take his AUD 38, exchange it for Rs. 874 (since 1 AUD = Rs.23) and buy a cricket bat in India and be no better off.

Purchasing-power parity theory tells us that price differentials between countries are not sustainable in the long run as market forces will equalize prices between countries and change exchange rates in doing so. The example of consumers going overseas to buy cricket bats may seem unrealistic as the expense of the longer trip would wipe out any savings you get from buying the bat for a lower price. However it is not unrealistic to imagine an individual or company buying hundreds or thousands of the bats in India then shipping them to Australia for sale. In the long run having different prices in Australia and India is not sustainable because an individual or company will be able to gain an arbitraae profit by buying the good cheaply in one market and selling it for a higher price in the other market.

Thus Absolute PPP says that,

P_{India} = Spot (Rs.lAUD) × $P_{Australia}$ $\quad$ implies

Spot Exchange rate (Rs./AUD) = $P_{India}/P_{Australia}$

Thus it is the price levels in countries that determine the exchange rate.

Since the price for any one good should be equal across markets, the price for any combination or basket of goods should be equalized.

So, why Purchasing Power Parity theory doesn't always work in practice?

Anything which limits the free trade of goods will limit the opportunities people have in taking advantage of these arbitrage opportunities. A few of the larger limits are :

1. **Import and Export Restrictions :** Restrictions such as quotas, tariffs and laws will make it difficult to buy goods in one market and sell them in another. If there is a 300% tax on imported cricket bats, then in our first example it is no longer profitable to buy the bat in India instead of the Australia. Australia could also just pass a law make it illegal to import cricket bats.

2. **Travel Costs :** If it is very expensive to transport goods from one market to another, we would expect to see a difference in prices in the two markets.

3. **Perishable Goods :** It may be simply physically impossible to transfer goods from one market to another. There may be a place which sells cheap sandwiches in Indore, but that doesn't help me if I'm living in Delhi. Of course, this effect is mitigated by the fact that many of the ingredients used in making the sandwiches are transportable, so we'd expect that sandwich makers in Delhi and Indore should have similar material costs.

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4. **Location :** You can't buy a piece of property in Indore and move it to New Delhi. Because of that realestate prices in markets can vary wildly. Since the price of land is not the same every where, we would expect this to have an impact on prices, as retailers in New Delhi have higher expenses than retailers in Indore.

So while purchasing power parity theory helps us understand exchange rate differentials, exchange rates do not always converge in the long run the way PPP theory predicts.

Absolute PPP works as a theoretical construct to understand an imaginary world of perfect competition. It does not serve well as a practical model to forecast exchange rates.

As a practical matter, a relative version of PPP has evolved, which states that the change in the exchange rate over time is determined by the difference in the inflation rates of the two countries.

THEORY OF INTEREST RATE PARITY :

There is a relationship between the foreign exchange market and the money market. This relationship affects the rate of exchange as well as the difference between spot rate and forward rate. The IRP says that the spread between the forward rate and the spot rate should be equal but opposite in sign to the difference in interest rates between two countries. So, as per IRP, a change in interest rate in any country will affect the exchange rates of its currency with other currencies and vice-a-versa. The basic principle is that there is an interconnection between the interest rates and the exchange rates. As per IRP, the forward exchange rates between two currencies will be equal to the spot rate adjusted for the interest rates differential between the currencies. According to IRP, the currency of one country with a lower interest rate should be at a forward premium in terms of the currency of the country with the higher interest rates. So, in an efficient market, the interest rate differential should be equal to the forward rate differential. When this condition is met, the forward rate is said to be at interest parity and the quilibrium prevails in the exchange market.

When the nominal interest rates differ from one country to another, the spot rate and the forward rate will also be different. The relationship can be expressed as follows:

$$\frac{Forward\ Rate}{Spot\ Rate} = \frac{1+r_h}{1+r_f}$$

Where r_h is the home interest rate and r_f is the foreign country rate.

Criticism of the Theory of Interest Rate Parity

The theory of interest rate parity is a very useful reference for explaining the differential between the spot and future, exchange rate, and international movement of capital. Accepting this theory implies that international finance markets are perfectly competitive and function freely without any constraints. However, reality is much more complex. Some of the major factors that inhibit the theory from being put into practice are as follows:

Availability of funds that can be unused for arbitrage is not infinite. Further, the importance of capital movements, when they are available, depends on the credit conditions practiced

between the financial places and on the freedom of actions of different operators as per the rules of the country in vogue.

Exchange controls certainly place obstacles in the way of theory of interest rate parity. The same is true about the indirect restrictions that can be placed on capital movement in the short run.

Interest rate is only one factor affecting the attitude and the behaviour of arbitrageurs. In the other words, capital movements do not depend only on interest rates. Other important factors are concerned with liquidity and the case of placement.

Speculation is an equally important element. This becomes very significant during the crisis of confidence in the future of currency. The crisis manifests in terms of abnormally high premium or discount – much higher that what the interest rate parity can explain.

Fisher Effects

All interest rates in a country are nominal interest rates consisting of two elements:

   a) The real interest rate, and
   b) The expected rate of inflation

The real interest rate is also known as the real required rate of return. The expected rate of inflation embodies an inflation premium sufficient to compensate lenders or investors for expected loss of purchasing power. So, the nominal interest rate depends on the rate of inflation and is defined as:

Nominal Interest Rate = (1+ Real Rate) (1+ Inflation Rate) – 1

The real interest rate is relatively stable over time and is identical every where, but the nominal interest rate will vary by the differences in expected rates of inflation. The Fisher Effect says that the real interest rates are equalized across the countries, otherwise arbitrage will take place. So, in the equilibrium stage, the nominal rate differential will approximately equal the anticipated inflation rate differential. This can be stated follows:

$$\frac{(1+r_h)}{(1+r_f)} = \frac{(1+i_h)}{(1+i_f)}$$

Where r_h and r_f are nominal interest rates for home currency and foreign currency and i_h and i_f are inflation rates.

So, the Fisher Effect analyses the relationship between the interest rates and the expected inflation. The countries with higher rate of inflation will have higher nominal interest rates.

Implications of IRP

   - *If domestic interest rates are less than foreign interest rates*, foreign currency must trade at a forward discount to offset any benefit of higher interest rates in foreign country to prevent arbitrage. IRP states that if foreign currency does not trade at a forward discount or if the forward discount is not large enough to offset the interest rate advantage of foreign country, then arbitrage opportunity exists for domestic investors. In such case, domestic investors can benefit by investing in the foreign market.

- *If domestic interest rates are more than foreign interest rates*, foreign currency must trade at a forward premium to offset any benefit of higher interest rates in domestic country to prevent arbitrage. If foreign currency does not trade at a forward premium or if the forward premium is not large enough to offset the interest rate advantage of domestic country, arbitrage opportunity exists for foreign investors. Foreign investors can benefit by investing in the domestic market.

Interest rate parity plays a fundamental role in foreign exchange markets, enforcing an essential link between short-term interest rates, spot exchange rates and forward exchange rates.

Covered Interest Arbitrage

First, let us examine what is an, uncovered interest arbitrage. Uncovered interest arbitrage is the notion that the forward exchange rate is an unbiased estimate of the future spot rate. Uncovered interest arbitrage assumes that, on average, an investor who borrows in a low interest rate country, converts the funds to the currency of a high interest rate country, and lends in that country will not realize a profit or suffer a loss. It follows from uncovered interest arbitrage that the expected return of a forward contract equals 0 percent

A covered interest arbitrage exists when an arbitrage profit can be made. The process of borrowing in one currency and simultaneously investing in another *with the exchange risk hedged in the forward market* is referred to *Covered Interest Arbitrage*.

If domestic interest rates are higher than the foreign interest rates, an arbitrageur would do the following :

He would borrow in foreign currency, convert receipts to domestic currency at the prevailing spot rate, invest in domestic currency denominated securities (as domestic securities carry higher interest). At the same time he would cover his principal and interest from this investment at the forward rate. At maturity, he would convert the proceeds of the domestic investment at prefixed domestic forward rate and payoff the foreign liability. The difference between the receipts and payments serve as profit to customer.

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Example :

$ Interest rate = 2% for 90 days in US	£ Interest rate = 3% for 90 days in UK
Spot $/£ = 1.50	90 day forward $/£ = 1.50

Arbitrageur does the following :

Step I   Borrow $1.50 million in US for 90 days.

Step II   Convert to £ at the prevailing spot rate Le. 1.50 to get £1 million

Step III Buy 90 days Deposit at UK Bank yielding 3% for 90 days.

Step IV Sell £1.03 million forward [£1 million + £0.03 million interest on deposit] at forward rate of 1.50 per £.

Step V At maturity he gets £ 1.03 million

Step VI Against his forward contract selling which he has booked he would get
1.50 × £ 1.03 = $1.545 million dollars

Compare this with 1.50 × 1.02= $1.530 million dollars he would have got by depositing directly in US deposits. Thus he made a profit of $1.545 – $1.530 = 0.015 million dollars i.e. $15000.

INTERNATIONAL FISHER EFFECT (IFE) :

IFE holds that the interest rates differentials should reflect the expected movement in the spot exchange rates, i.e., the spot exchange rate should move an equal amount but in a different direction to the difference in interest rates in two countries. The spot rate of a currency with higher interest rate would depreciate and that of a lower interest rate would appreciate.

So, the interest rate differentials between two countries are offset by the spot and forward exchange rates which is as follows:

$$\frac{S_1}{S_0} = \frac{1+r_h}{1+r_f}$$

Where S_0 = Current Spot Rate

S_1 = Future Spot Rate

r_h = Home Interest Rate

r_f = Foreign Exchange Rate

Advangates of International Fisher Effect

- Uses interest rate differentials to explain changes in exchange rates

- Assumes real interest rates are the same globally

- Believes high nominal rates indicate, potentially higher inflation and probable weakening of the currency

9.5 Foreign Direct Investment (FDI)

This Section includes :

- **FDI Cash Flows**
- **Factors attracts FDIs**
- **Factors that discourage FDIs**

INTRODUCTION :

Foreign investment into a country can come in form of direct investment or portfolio investment. Portfolio investment takes the form of acquisition of tradable securities either in primary or secondary market. Foreign Investment is preferred for its direct nature. It implies a more lasting interest and controlling voice in the management. Theoretically, FDI is less violate than that the portfolio investment.

FDI CASH FLOWS :

Foreign direct investment is one of the most important sources of foreign investment in developing countries like India. It is seen as a means to supplement domestic investment for achieving a higher level of growth and development. FDI is permitted under the forms of investments.

1. Through financial collaborations / capital / equity participation;

2. Through Joint ventures and technical collaborations;

3. Through capital markets (Euro Issues);

4. Through private placements or preferential allotment.

Capital participation / financial collaboration refers to the foreign partner's stake in the capital of the receiving country's companies while technical collaboration refers to such facilities provided by foreign partner as licencing, trade marks and patents (against which he gets lump sum fee or royalty payments for specified period); technical services etc.

From investors' point of view, the FDI inflows can be classified into the following groups.

a) **Market seeking:** The investors are attracted by the size of the local market, which depends on the income of the country and its growth rate.

b) **Lower cost :** Investors are more cost-conscious. They are influenced by infrastructure facilities and labour costs.

c) **Location and other factors:** Technological status of a country, brand name, goodwill enjoyed by the local firms, favourable location, openness of the economy, policies of the government and intellectual property protection granted by the government are some of the factors that attract investors to undertake investments.

FACTORS THAT ATTRACTS FDIS IN INDIA :

The following factors can be held responsible for the flow of foreign direct investments in India:

1. India has a well developed network of banking and financial institutions and an organized capital market open to foreign institutional investors that attracts them to undertake investments.

2. India has vast potential of young entrepreneurs in the private sector. India skills and competence is used as a base for carrying out production activities and export to neighbour countries.

3. For the last few years there has been political stability in the country.

4. India enjoys good reputation among other countries as to honouring of its commitments about repayment obligations, remittance of dividends etc.

5. India has vast potential of unskilled labour available at cheap rates as compared to other countries, and vast natural resources that attract foreign investors.

FACTORS THAT DISCOURAGE FDIS :

Factors that discourage foreign investors to undertake investments in India include:

(i)   High rates of taxation;

(ii)   Lack of infrastructure facilities;

(iii)   Favouritism in the selection of investment;

(iv)   Complicated legal framework of rules, regulations procedures for foreign direct investments into India;

(v)   Lack of transparency.

FDI Inflows

Foreign Direct Investment is an important avenue through which investment takes place in India. The importance of FDI extends beyond the financial capital that flows into the country. In addition, foreign direct investment can be a tool for bringing knowledge, and integration into global production chains, which are the basis of a successful exports strategy.

The following shows FDI Inflows:

Foreign direct investment in some Asian developing countries						
Country	Foreign Direct Investment Inflows (billions of US $)			Share in World FDI Inflows		
	2002	2003	2004	2002	2003	2004
China	52.74	53.51	60.63	7.36	8.46	9.35
Hong Kong	9.68	13.62	34.04	1.35	2.15	5.25
India	3.45	4.27	5.34	0.48	0.67	0.82
Indonesia	0.15	-0.6	1.02	0.02	-0.09	0.16
Korea	2.98	3.79	7.69	0.42	0.60	1.19
Malaysia	3.2	2.47	4.62	0.45	0.39	0.71
Philippines	1.79	0.34	0.47	0.25	0.05	0.07
Singapore	5.82	9.33	16.06	0.81	1.47	2.48
Sri Lanka	0.2	0.23	0.23	0.03	0.04	0.04
Thailand	0.95	1.95	1.06	0.13	0.31	0.16
Developing economies	155.53	166.34	233.23	21.72	26.29	35.98
World	716.13	632.6	648.15	100.00	100.00	100.00

Source : World Investment Report 2005, UNCTAD

Study Note - 10

INTERNATIONAL MONETARY FUND AND FINANCIAL SYSTEM

INTRODUCTION :

A sound knowledge of international financial systems is a pre-requisite for the following reasons :

a. Global trade have been on the steady increase

b. Global opportunities have to be exploited

c. It helps in avoiding delays in handling global trade

d. There are a number of financial intermediaries and institutions that facilitate global trade

e. Technology is a great enabler in fostering international trade and scaling up of operations

f. Globally, there is a trend towards elimination of all trade barriers and facilitate uninterrupted global trade

g. Loss due to exchange fluctuations if not prevented or attended immediately would erode the fortunes of the company.

The economic change witnessed by the world like the disintegration of Soviet Union, political and economic freedom in eastern Europe, the emergence of market-oriented economies in Asia, the creation of a single European market, trade liberalization through regional trading blocs, such as European union, the world's joint mechanism, such as the world trade organization, have all impacted and facilitated the growth of international trade.

In 1989, Mexico significantly liberalized its foreign direct investment regulations to allow 100% foreign ownership. The North American Free Trade Agreement of 1994 extends the areas of permissible foreign direct investment and protects foreign investors with a dispute settlement mechanism. This is an example of fostering international trade.

MOTIVES FOR WORLD TRADE AND FOREIGN INVESTMENT

The theories of comparative advantage, factor endowments and product life cycle have been suggested as three major motives for foreign trade.

Theory of Comparative Advantage

This is the classical economic theory which explains why countries exchange their goods and services with each other. The underlying assumption is that some countries can produce some types of goods more efficiently than other countries. Hence, the theory of comparative advantage assumes that all countries are better off when each one specializes in the production of those goods which it can produce more efficiently and buys those goods which other countries produce more efficiently. It neutralizes the cost and benefits more effectively.

The Theory of Factor Endowments

Countries are endowed differently in their economic resources. Columbia is more efficient in the production of coffee and the US is more efficient in the production of computers. Colombia has the oil, weather and abundant supply of unskilled labor necessary to produce coffee more economically than the US. Differences in these national factor endowments explain differences in comparative factor costs between the two countries. Each country has to take advantage of its own strengths and also trade it off against other countries strenghs.

Product Life Cycle

All products have a certain length of life. During this life they go through certain stages. The product life cycle theory explains both world trade and foreign investment patterns on the basis of stages in a product's life. In the context of international trade, the theory assumes that certain products go through four stages: Introduction and export, international production, intense foreign competition and imports.

Trade Control

The possibility of a foreign embargo on sales of certain products and the needs of national defense may cause some countries to seek self sufficiency in some strategic commodities. Political and military questions constantly affect international trade and other international business operations. Tariffs, import quotas and other trade barriers are three primary means of protectionism. This is where a country's economic reforms and liberalization really support international trade in a big way.

WORLD TRADE BODIES :

In 1947, 23 countries signed the General Agreement on Tariffs and Trade (GATT) in Geneva. To join GATT, countries must adhere to Most Favored Nation (MFN) clause, which requires that if a country grants a tariff reduction to one country, it must grant the same concession to all other countries. This clause applies to quotas also.

The new organization, known as the World Trade Organization (WTO), has replaced the GATT since the Uruguay Round accord became effective on January 1, 1995. Today, WTO's 135 members account for more than 95% of world trade. The five major functions of WTO are:

   a.   Administering its trade agreements

   b.   Being a forum for trade negotiations

   c.   Monitoring national trade policies

   d.   Providing technical assistance and training for developing countries

   e.   Cooperating with other international organizations

Under the WTO, there is a powerful dispute-resolution system, with three-person arbitration panel. Some of the major features of WTO and GATT are:

   a.   World Trade Organization (WTO), was formed in 1995, head quartered at Geneva, Switzerland

   b.   It has 152 member states

   c.   It is an international organization designed to supervise and liberalize international trade

   d.   It succeeds the General Agreement on Tariffs and Trade

   e.   It deals with the rules of trade between nations at a global level

   f.   It is responsible for negotiating and implementing new trade agreements, and is in charge of policing member countries' adherence to all the WTO agreements, signed by the bulk of the world's trading nations and ratified in their parliaments.

   g.   Most of the WTO's current work comes from the 1986-94 negotiations called the Uruguay Round, and earlier negotiations under the GATT. The organization is currently the host to new negotiations, under the Doha Development Agenda (DDA) launched in 2001.

   h.   Governed by a Ministerial Conference, which meets every two years; a General Council, which implements the conference's policy decisions and is responsible for day-to-day administration; and a director-general, who is appointed by the Ministerial Conference.

The General Agreement on Tariffs and Trade (GATT)

   a.   GATT was a treaty, not an organization.

   b.   Main objective of GATT was the reduction of barriers to international trade through the reduction of tariff barriers, quantitative restrictions and subsidies on trade through a series of agreements.

c. It is the outcome of the failure of negotiating governments to create the International Trade Organization (ITO).

d. The Bretton Woods Conference had introduced the idea for an organization to regulate trade as part of a larger plan for economic recovery after World War II. As governments negotiated the ITO, 15 negotiating states began parallel negotiations for the GATT as a way to attain early tariff reductions. Once the ITO failed in 1950, only the GATT agreement was left.

e. The functions of the GATT were taken over by the World Trade Organization which was established during the final round of negotiations in early 1990s.

TRADE-RELATED INVESTMENT MEASURES (TRIMS) :

a. TRIMs are the rules a country applies to the domestic regulations to promote foreign investment, often as part of an industrial policy.

b. It is one of the four principal legal agreements of the WTO trade treaty.

c. It enables international firms to operate more easily within foreign markets.

d. In the late 1980's, there was a significant increase in foreign direct investment throughout the world. However, some of the countries receiving foreign investment imposed numerous restrictions on that investment designed to protect and foster domestic industries, and to prevent the outflow of foreign exchange reserves.

e. Examples of these restrictions include local content requirements (which require that locally-produced goods be purchased or used), manufacturing requirements (which require the domestic manufacturing of certain components), trade balancing requirements, domestic sales requirements, technology transfer requirements, export performance requirements (which require the export of a specified percentage of production volume), local equity restrictions, foreign exchange restrictions, remittance restrictions, licensing requirements, and employment restrictions. These measures can also be used in connection with fiscal incentives. Some of these investment measures distort trade in violation of GATT Article III and XI, and are therefore prohibited.

TRADE RELATED ASPECTS OF INTELLECTUAL PROPERTY RIGHTS (TRIPS) :

a. TRIPS is an international agreement administered for the first time by the World Trade Organization (WTO) into the international trading system.

b. It sets down minimum standards for many forms of intellectual property (IP) regulation.

c. Till date, it remains the most comprehensive international agreement on intellectual property.

d. It was negotiated at the end of the Uruguay Round of the General Agreement on Tariffs and Trade (GATT) in 1994.

e. TRIPS contains requirements that nations' laws must meet for : copyright rights, including the rights of performers, producers of sound recordings and broadcasting

organizations; geographical indications, including appellations of origin; industrial designs; integrated circuit layout-designs; patents; monopolies for the developers of new plant varieties; trademarks; trade dress; and undisclosed or confidential information. TRIPS also specify enforcement procedures, remedies, and dispute resolution procedures.

f. In 2001, developing countries were concerned that developed countries were insisting on an overly-narrow reading of TRIPS, initiated a round of talks that resulted in the Doha Declaration: a WTO statement that clarifies the scope of TRIPS; stating for example that TRIPS can and should be interpreted in light of the goal "to promote access to medicines for all".

TRADING BLOCS; TYPES OF ECONOMIC COOPERATION :

A trading bloc is preferential economic arrangement between a group of countries that reduces intra-regional barriers to trade in goods, services, investment and capital. There are more than 50 such arrangements at the present time. There are five major forms of economic cooperation among countries: Free trade areas, customs unions, common markets, economic unions and political unions.

The North American Free Trade Agreement (NAFTA) among US, Canada and Mexico is an example of Free trade areas where member countries remove all trade barriers among themselves.

Under the customs union arrangement, member nations not only abolish internal tariffs among themselves but also establish common external tariffs.

In a common market type of agreement, member countries abolish internal tariffs among themselves and levy common external tariffs. The also allow the free flow of all factors of production, such as capital, labor and technology.

The economic union combines common market characteristics with harmonization of economic policy. Member nations are required to pursue common monetary and fiscal policies.

Political union combines economic union characteristics with political harmony among the member countries.

Motives for Foreign Investment

The product life cycle theory, the portfolio theory and the oligopoly model have been suggested as bases for explaining and justifying foreign investment.

Product life cycle theory explains changes in the location of production. After successful launch of new products, companies shift the manufacturing base to other countries for lowering costs and retain the margin. This is what is witnessed in India today, which has become the destination for low cost outsourcing. For eg. South India is called Detroit of US due to many MNC automobile companies setting up their production facilities there.

Portfolio theory indicates that a company is often able to improve its risk-return performance by holding a diversified portfolio of assets. This theory represents another rationale for foreign investment. The diversified portfolio will include foreign assets.

Under the oligopoly model, the assumption is that business firms attract foreign investments to exploit their quasi monopoly advantages. The advantage of an MNC over a local company may include technology, access to capital, differentiated products built on advertising, superior management and organizational scale.

BALANCE OF PAYMENTS :

A country's balance of payments is defined as the record of transactions between its residents and foreign residents over a specified period, which includes exports and imports of goods and services, cash receipts and payments, gifts, loans, and investments. Residents may include business firms, individuals and government agencies. The balance of payments helps business managers and government officials to analyze a country's competitive position and to forecast the direction of pressure on exchange rates. Government's export import policies also mainly depend on this.

The balance of payments is a sources-and-uses-of-funds statement reflecting changes in assets, liabilities and net worth during a specified period. Transactions between domestic and foreign residents are entered in the balance of payments as either debits or credits. Transactions that earn foreign exchange are often called credit transactions and represent sources of funds. Transactions that expend foreign exchange are called debit transactions and represent use of funds. A country incurs a 'surplus' in its balance of payments if credit transactions exceed debit transactions or if it earns more abroad than it spends. On the other hand, a country incurs a deficit' in its balance of payments if debit transactions are greater than credit transactions or if it spends more abroad than it earns. Surpluses and deficits in the balance of payments are of considerable interest to banks, companies, portfolio managers and governments.

They are used to:

    a. Predict pressure on foreign exchange rates

    b. Anticipate government policy actions

    c. Assess a country's credit and political risk

    d. Evaluate country's economic health

Balance of Payments Accounts

The international monetary fund (IMF) classifies balance of payments transactions into five major groups:

    a. Current account: merchandise, services, income and current transfers

    b. Capital account: Capital transfers, non-produced assets, non financial assets

    c. Financial account: Direct investments, portfolio investments and other investments

    d. Net errors and omissions

    e. Reserves and related items: These are government owned assets which include monetary gold, convertible foreign currencies, deposits, and securities. The principle convertible currencies are the US dollar, the British pound, the euro, and the Japanese Yen for most countries. Credit and loans from the IMF are usually denominated in special drawing rights (SDRs). Sometimes called 'paper gold' SDRs can be used as means of international payment.

INTERNATIONAL ORGANISATIONS AND ACCOUNTING STANDARDS :

Many accounting professionals perceive standardization to be too strict and inflexible to provide the information users need;

Harmonisation is necessary as so many MNCs are doing business in numerous countries;

Several international organizations dealing with the harmonization challenge:

- IASC: Founded in 1973 by agreement among professional accounting organizations in 9 countries; now grown to over 70 countries; over 100 professional accounting organizations;

IASC develops and publishes IASs. IASC also promotes these standards for wide international acceptance;

Some countries use IASs as their national accounting rules and others use them as basis for their own accounting rules; MNCs voluntarily use IASs for secondary set of financial statements;

- European Union (EU): Founded on 25/3/57, is the Association of European States, when Belgium, France, West Germany, Italy, Luxembourg and Netherlands signed the Treaty of Rome. Treaty was free movement of labour, capital and goods among member countries by 1992, without any tariff or barrier.

Now EU imports and exports more than any single country in the world; with US as major trading partner; there are 15 member countries now;

4th Directive:

7th Directive:

8th Directive:

Mutual Recognition Directive:

Directive of Dec 8, 1986

11th Directive of Feb 13, 1989

EU Cooperation with IASC:

- It is a major step in the direction of international harmonisation;
- It is to facilitate multinational companies to prepare one set of financial statements that would be accepted by stock exchanges worldwide.

Organisaton for Economic Cooperation and Development (OECD):

Established on Dec 14, 1960; formed by 24 most powerful countries; HQ at Paris;

It is an international organization for economic research and policy analysis;

It provides reports on financial accounting and reporting and economic development.

In countries such as India, Canada and Australia, Foreign Investments need government approval. In US and Switzerland, even domestic investments need government approval.

OECD guidelines provide for "Disclosure of information" in financial statements. There exists open and cooperative relationship among the various organizations seeking to set international accounting standards such as IASC and EU commission.

International Organisation of Securities Commissions (IOSCO)

It is a private organization with the objective of integrating the securities markets worldwide and for developing financial reporting standards and their effects on securities markets.

United Nations (UN)

UN studies the impact of multinational corporations on development and international relations and brings out publications on international accounting and reporting issues.

International Federation of Accountants (IFAC)

IFAC established in 1977 if for development of accounting profession and works to achieve international technical, ethics and education pronouncements for the profession.

Other organizations are:

Asia-Pacific Economic Cooperation

Nordic Federatin of Accountants

Association of Southeast Asian Nations

International Monetary System

The international monetary system consists of laws, rules, institutions, instruments and procedures which involve international transfer of money. These elements affect foreign exchange rates, international trade and capital flows and balance of payment adjustments. Foreign exchange rates determine prices of goods and services across national boundaries. These exchange rates also affect international loans and foreign investment. Hence, the international monetary system plays a critical role in the financial management of multinational business and economic policies of individual countries.

Foreign Exchange System

a. A global company's access to international capital markets and its freedom to move funds across national boundaries are subject to a variety of national constraints.

b. These constraints are frequently imposed to meet international monetary agreements on determining exchange rates.

c. Constraints may also be imposed to correct the balance of payments deficit or to promote national economic goals.

d. A foreign exchange rate is the price of one currency expressed in terms of another currency. A fixed exchange rate is an exchange rate which does not fluctuate or which changes within a predetermined band. The rate at which the currency is fixed or pegged is called 'par value'. A floating or flexible exchange rate fluctuates according to market forces.

Advantages of Flexible Exchange Rate System

    a. Countries can maintain independent monetary and fiscal policies

    b. Permits smooth adjustment to external shocks

    c. Central banks need not maintain large international reserves to defend a fixed exchange rate

Disadvantages of Flexible Exchange Rate System

    a. Unstable exchange rates can prevent free flow of trade

    b. Inherently inflationary because they remove external discipline

CONCEPTS IN FOREIGN EXCHANGE RATE :

    a. An appreciation is a rise in the value of a currency against other currencies under a floating rate system.

    b. A depreciation is a decrease in the value of a currency against other currencies under a floating rate system.

    c. A revaluation is an official increase in the value of a currency by the government of that currency under a fixed rate system.

    d. A devaluation is an official reduction in the par value of a currency by the government of that currency under a fixed rate system.

Currency Boards

A currency board is a monetary institution that only issues currency to the extent it is fully backed by foreign reserves. Its major attributes are:

    a. An exchange rate that is fixed not just by policy but by law

    b. A reserve requirement to the extent that a country's reserves are equal to 100 percent of its notes and coins in circulation

    c. A self correcting balance of payments mechanism where a payment deficit automatically contracts the money supply and thus the amount of spending as well

    d. No central bank under a currency board system

    e. In addition to promoting price stability, a currency board also compels the government to follow a responsible fiscal policy.

    f. Countries like Mauritius, Hong Kong, Estonia, Argentina, Lithuania, Bulgaria and Bosnia are countries that have adopted currency board system.

History of the International Monetary System

The pre-1914 gold standard: a fixed exchange system:

In the pre-1914 era, most of the major trading nations accepted and participated in an international monetary system called the gold standard. Under this regime, countries use gold as a medium of exchange and a store of value. The gold standard had a stable exchange rate.

Monetary disorder: 1914-45: a flexible exchange system:

The gold standard collapsed after the First World War and ended the stability of exchange rates for the major currencies of the world. The value of currencies fluctuated very widely. The great depression of 1929-32 and the international financial crisis of 1931, further prevented the restoration of gold standard. Governments started devaluing their currencies to support exports.

Fixed exchange rates: 1945-73:

a. The Bretton woods agreement was signed by representatives of 44 countries in 1944 to establish a system of fixed exchange rates.

b. Under this system, each currency was fixed by government action within a narrow range of values relative to gold or some currency of reference. US dollar was used frequently as a reference currency to establish the relative prices of all other currencies

c. At this conference, they agreed to establish a new monetary order, which centered on IMF and IBRD (World Bank).

d. IMF provides short term balance of payment adjustment loans, while the world bank makes long term development and reconstruction loans.

e. The agreement emphasized the stability of exchange rates by adopting the concept of fixed but adjustable rates.

Breakdown of the Bretton Woods System:

a. The late 1940s marked the beginning of large deficits in the US balance of payments. America's payments deficits resulted in dilution of US gold and other reserves during the 1960s and early 1970s.

b. In 1971, most major currencies were permitted to fluctuate. US dollars fell in value against a number of major currencies. Several countries caused major concern by imposing some trade and exchange controls which was feared that such protective measures might become widespread to curtain international commerce.

c. In order to solve these problems, the world's leading trading countries, called the 'Group of Ten', produced the Smithsonian Agreement in 1971.

The post 1973 dirty floating system:

The exchange rate became much more volatile during this period due to a number of events affecting the international monetary order. Oil crisis of 1973, loss of confidence in US dollar between 1977 and 1978, second oil crisis in 1978, formation of European monetary system in 1979, end of Marxist revolution in 1990 and Asian financial crisis in 1997.

THE INTERNATIONAL MONETARY FUND (IMF) :

a. An international organization created in 1944 with a goal to foster global monetary cooperation, secure financial stability, facilitate international trade, promote high employment and sustainable economic growth, and reduce poverty.

b. Oversees the global financial system by following the macroeconomic policies of its member countries, in particular those with an impact on exchange rates and the balance of payments.

c. Offers financial and technical assistance to its members, making it an international lender of last resort. Countries contributed to a pool which could be borrowed from, on a temporary basis, by countries with payment imbalances.

d. It is headquartered in Washington, D.C., USA.

e. The IMF has 185 member countries

Current Actions :

a. The International Monetary Fund's executive board approved a broad financial overhaul plan that could lead to the eventual sale of a little over 400 tons of its substantial gold supplies.

b. The board of IMF has proposed a new framework for the fund, designed to close a projected $400 million budget deficit over the next few years.

c. The budget proposal includes sharp spending cuts of $100 million until 2011.

Membership Qualifications:

a. Any country may apply for membership to the IMF. The application will be considered first by the IMF's Executive Board.

b. After its consideration, the Executive Board will submit a report to the Board of Governors of the IMF with recommendations (the amount of quota in the IMF, the form of payment of the subscription, and other customary terms and conditions of membership) in the form of a "Membership Resolution".

c. After the Board of Governors has adopted the "Membership Resolution," the applicant state needs to take the legal steps required under its own law to enable it to sign the IMF's Articles of Agreement and to fulfill the obligations of IMF membership.

d. Similarly, any member country can withdraw from the Fund, although that is rare (Ecuador, Venezuela)

e. A member's quota in the IMF determines the amount of its subscription, its voting weight, its access to IMF financing, and its allocation of Special Drawing Rights (SDRs).

f. A member state cannot unilaterally increase its quota - increases must be approved by the Executive Board and are linked to formulas that include many variables such as the size of a country in the world economy.

g. IMF established rules and procedures to keep participating countries from going too deeply into balance of payments deficits. Those countries with short term payment difficulties could draw upon their reserves, defined in relation to each member's quota.

THE EUROPEAN MONETARY UNION

A monetary union is a formal arrangement in which two or more independent countries agree to fix their exchange rates or employ only one currency to carry out all transactions. Full European monetary union was achieved in 2002, which enabled 15 EU countries to carry out transactions with one currency through one central bank under one monetary policy. A single currency called the EURO was adopted.

10.2 Export – Import Procedures and Documentation

This Section includes :

- Foreign Trade Terms
- Letters of Credit
- Types of Credit
- Documentation of Foreign Trade

INTRODUCTION :

The starting point of an international commercial transaction is an enquiry from a party abroad about the terms of sale of any commodity. The exporter then sends his quotations for various types and qualities of his products either in rupees/dollars or other currencies along with samples, if necessary. These quotations may be on cost ex works basis or cost plus freight (C&F) or cost, insurance plus freight (c.i.f) then a sale contract is entered into. This can be a formal legal contract or informal written agreement or even an exchange of correspondence evidencing the intention to buy and sell. A sale contract incorporates the terms and conditions, quality and quantity of the goods, packing and specifications, the place and mode of delivery, the period of delivery, payment terms, prices accepted etc. Normally, the exporter has to add to his ex-works price the cost of :

   (a) Transportation from his factory to the port;
   (b) Port Commissioner's charges;
   (c) Shipping, freight and other forwarding agents fees, handling charges etc;
   (d) Insurance from warehouse etc.

FOREIGN TRADE TERMS :

Exporters and importers would first get to know of foreign offers to buy or sell from the Indian Trade Missions abroad, Indian Embassies, Trade Development Authority in India, various Chambers of Commerce, Government bodies such as the Export Promotion Councils, Commodity Boards, Development Councils, etc. The global or regional tenders and trade enquiries are published in the Financial News Bulletins, daily papers, Weekly or Monthly Bulletins of the Ministry of Commerce, DGCI&S, Chambers of Commerce or TDA, etc. Sometimes, the exporters get in touch with importers through their own agencies, correspondents and branches abroad. They may also get to know of the enquiries from the Trade Missions or Trade Consuls to various countries in India and Joint Chambers like Indo-American Chamber, etc. Exporters and importers would keep in touch with these agencies and their publications, bulletins etc. Lastly, often, participation in foreign exhibitions, trade fairs, visits abroad and business contract abroad also help secure foreign contracts.

Sale Terms

Sale terms should be clearly stated whether ex-works, f.o.b., c.f. or c.i.f. In international trade, disputes can be avoided by clearly specifying the rights and obligations of both parties to the contract viz., seller and buyer. The International Chamber of Commerce provides guidelines regarding these rights ad obligations, some of which are referred to in the Appendix.

In an ex-works quotation, ownership of goods is transferred at the Octroi itself from the seller to buyer. The buyer or his agent arranges for transportation to the port, its loading, shipping, insurance, clearance etc. The examples are the purchase of jute goods, tea, etc., in Calcutta by the agents of the USSR, Syria and Iran.

In an f.o.b. quotation (free on board) or f.a.s (free along side) the seller delivers the goods on board the ship named by the buyer while the subsequent responsibility lies with the buyer or his agents. In a.c.f quotation, the seller is responsible for transport to the ship, loading and shipping etc., while the insurance is borne by the buyer. In the c.i.f, quotation, even the insurance is borne by the seller and he includes in the price quoted, the cost of goods, packing handling, loading, transport shipping and insurance, c.i.f & c quotation includes cost, insurance, freight and commissions.

The terms of sales depend on the custom of trade, nature of the product sold, profit margins in the trade, legal and government controls in the respective countries, organization of the firm and the circumstances of the buyer and seller.

Payment Terms

The terms relating to payment should also be clearly stated in the sales contract itself. If payment is arranged within a period of six months, this is called short-term payment and the exchange control rules in India necessitate in general, all receipts to be secured within six months of the date of shipment. This was relaxed after effecting free convertibility of rupee on trade account in March 1993. Payment terms depend upon the commodity sold, position of the buyer and seller, trade practices and availability of bank credit. Some of the important terms of payment leaving aside the letters of credit involving bank credit which will be discussed later are cash with order, consignment sales and open account.

1. Cash with order:

Cash with order or advance payment is the best term possible which is accepted by the buyers only in extraordinary circumstances when the goods are to be the buyer's specifications and no other buyer may be willing to take them. Exchange Control regulations now permit advance payment in certain cases.

2. Consignment sales:

Goods like tea, coffee, wool etc., which cannot be standardized and where the produce should be available in the foreign market physically to be sold are sent on a consignment basis. The consignment is to an agent or representative abroad whose integrity and credit worthiness are known to the exporter. Sometimes, the consignee executes a bank guarantee to the effect that as and when goods are sold, the sale proceeds will be duly remitted. In this case, banks enter into the transaction either as remitting agency for importers or collecting agency for exporters.

3. Open Account:

Goods are sold on open account when there will be no drawing of bills or other documents to negotiate by banks. "On payment" is made at periodical intervals by DDs, TTs, etc. as and when the sales are made. Such terms are limited only to subsidiaries, associate firms or closely connected firms such as foreign collaborators.

Buyers' Credit

If credit is granted to the buyer by a financial institution in the seller country or a financial institution in the buyer country, then it is called buyer's credit. The buyer enters into an agreement with the financial institutions to pay the supplier on cash basis or document basis and credit granted to the buyers for the purpose. The financial agreement between the buyers and the financial institution lays down the conditions to be fulfilled by the supplier before payment is made to him such as the form, values and maturity of promissory notes, the form in which the supplier must present the claims and bills to the financing bank, interest rate applicable, credit repayment terms, taxes, commission and other charges to be paid by the borrower, and the procedure to be followed in the case of defaults. Such credits are generally granted by the supplier country's financial institution like EXIM Bank for periods ranging from 5 to 10 years. The supplier in such cases gets the government and the central bank's clearance and for arranging this type of credit.

Lines of Credit

A line of credit is granted by a foreign government or an international institution in the buyer country so that a larger number of buyers could benefit from it. This generally is available for a programme such as Railways, Roads, Electricity, Water Supply etc., and the responsibility for assessing the creditworthiness of the buyers or of the project is passed on to the buyer country's financial institution. Such credit lines are granted to ICICI in India by the German banks and UK banks for purchase of capital goods and machinery in respect of plastics, drugs etc. and by the IDBI to Bangladesh, Malaysia, Mauritius etc.

LETTERS OF CREDIT – DOCUMENTARY AND NON-DOCUMENTARY

Letter of credit is the most important mode of payment for trade throughout the world. As the buyers and sellers are often not known to each other and the bankers are well known for their credit standing, the banks creditworthiness is substituted for the creditworthiness of the buyer under this method. The documentary L/C is an undertaking given by the bank to pay or accept the bill provided the beneficiary (exporter) fulfils the terms and conditions of sale as set out in the application made to the bank by the importer (buyer). Generally, banks follow in India uniform customs and practice code in the issue of the documentary credits which will be binding as between banks and between banks and customers. The documentary credit protects the seller from the risk of loss of funds due to the uncertain credit position of the buyer and promotes foreign trade and foreign investment. The bank charges from the buyer-importer at the interest rate admissible for the credit so granted and may or may not ask for a margin deposit of funds for the purpose. The banks also charge for the handling of documents in the process of negotiation or collection. In the case of non-documentary credits, no documents need accompany the Bill of Exchange in which case the exporter bank only arranges to collect the amounts involved and no handling charges may be levied.

TYPES OF CREDIT :

Documentation in respect of credit will depend upon the type of credit available from banks.

a) Revocable or Irrevocable:

While revocable credit can be cancelled at any time without the concurrence of the beneficiary, the irrevocable credit cannot be so revoked.

The revocable letter of credit, according to the International Chamber of Commerce, is "not a legally binding undertaking between the bank or banks concerned and the beneficiary". Irrevocable letter of credit is a definite undertaking on the part of the issuing banks and constitutes an obligation to the beneficiary to honour bills or drafts under the credit, provided the terms and conditions of the credit are complied with. Even the revocable credit is good until it is cancelled and the cancellation is notified to the beneficiary and/or his bank and proves the bonafides and the intention of importing by the buyers.

b) Confirmed and unconfirmed Credits:

A documentary L/C which is irrevocable can be confirmed or unconfirmed. The confirmation of the importer bank is communicated through its correspondent or agent or branch in the exporter's country. If it is an irrevocable credit, the latter bank – correspondent, agent or branch – confirms the credit to the beneficiary. The confirmation adds further strength to the exporter in his own country by his own banker. If the local bank advises the credit without confirming, it is called "unconfirmed credit". While the confirming bank has an obligation to negotiate bills under this credit drawn by the beneficiary, the advising or notifying bank has no such obligation.

c) Transferable Credit:

It is one which contains an express provision that the benefits under it to be enjoyed by the beneficiary can be transferred from the latter to a third party who supplies him raw materials for this manufacture or supplies manufactured outputs if he is a merchant trader.

d) Back-to-back Credits:

There are the secondary credits opened by a bank on behalf of the beneficiary of an original credit in favour of the domestic supplier. This is a formal opening of another credit line on the basis of credit to the beneficiary. Suppose a London importer of tea opens a confirmed irrevocable Letter of Credit through the Barclays Bank in London to the Bank of India in Calcutta. As the tea merchant has to buy tea from a tea producer, the former may arrange with the Bank of India to issue a confirmed letter in favour of the tea producer for his use in the manufacturing process. This is known as "back-to-back credit".

e) Red Clause or Green Clause:

This is incorporated only in irrevocable credits and authorizes the negotiating bank to make advances to the beneficiary to enable him to manufacture or purchase the goods from the local suppliers. When relations between the exporter and importer are close or they are connected as collaboration or suppliers of long standing, then the red clause is incorporated in the L/C at the request of the importer buyer for the benefit of the exporter. Such clauses are used in packing credit arrangements in wool exports, tea exports, etc.

f) Revolving Credit:

These credits are granted on a revolving basis to suit the requirements of suppliers who are doing this business on a continuing basis. This credit obviates the need for opening fresh letters for each shipment. As soon as the negotiated drafts under the credit are reimbursed by the importer to the bank opening the credit, fresh credit is available to the foreign negotiation bank.

It will thus be seen from the above discussion that the parties to the L/C, besides the buyer, beneficiary and the issuing bank are the notifying bank which advises the credit to the exporter in his country, confirming bank which confirms the credit to the exporter in his country, the negotiating bank which negotiates the drafts, bills of exchange etc., and the paying bank which finally pays to the exporter. If the notifying bank also confirms the credit and negotiates the bills, then all the three parties are merged into one bank. The paying bank may be the original issuing bank in the buyer's country in which case, the bill is drawn in the foreign currency (from the point of view of exporter) or by the notifying or confirming bank in which case the bill is drawn and paid in the local currency of the exporter.

DOCUMENTATION OF FOREIGN TRADE :

The documents used in foreign trade are broadly of two categories, namely substantive documents and auxiliary documents. In the first category are included: (1) Bill of Lading (2) Marine Insurance and (3) Bill of Exchange. The auxiliary instruments are commercial invoices, consular invoice, custom invoice, certificate of origin, inspection certificate, packing list, etc.

1. Bill of Lading

The Bill of Lading is an important document issued by a common carrier, namely, the shipping company or Airways, stating that the goods mentioned therein have been received for shipment or airlift and that it has undertaken to deliver the goods at a named destination on payment of freight or for which freight has already been paid (c.i.f. or c.f.). The Bill of Lading is a document of title to goods, transferable by endorsement and is a receipt from the shipping company regarding the number of packages with a particular weight and markings and a contract for the transportation of the same to a part of destination mentioned therein. The shipping company is governed by the carriage of goods by the Sea Act which provides protection to shippers and obligations on the shipping companies.

A Bill of Lading stating "Received for Shipment" is not adequate if the sales terms are "on board". The bill should specify that goods have been "on board" or "shipped" to satisfy the terms of c.i., or c.i.f.

Bills of Lading are the following types

(a) Freight paid or freight payable. In the case of c.i.f. or c.f., the freight should be paid by the shipper and in case of f.o.b., it may be payable by the consignee or importer or his agent. The bill of lading "Freight collect" is, therefore, not proper tender for c.i.f. terms of sale;

(b) Clean or claused bill. In the case of any adverse remarks such as "damaged bags" or "bill torn" or "Drums dirty or old", such bill are called "claused" or dirty bills as against clean bills which do not mention anything adverse on the condition of packages,

(c) Stale bill of lading. If the bills are kept for too long with the shipper and by that time goods might have reached the destination port, the importer has to pay demurrages for non-acceptance of the goods which is due to delay in the receipt of shipping documents. Such delayed bills of lading are called "Stale Bills".

Mates's Receipt

When goods are delivered to the agent of a shipping company for shipment by a specified vessel and he agrees to do so, then a Mate's Receipt is given to the shipper. This is exchanged for a regular Bill of Lading from the Master of the ship or the shipping company. Mate's Receipt is, however, not an acceptable document to the Bank from the point of its negotiation. For such terms as "on board" or shipped or c.i.f. or c.f., this is not adequate delivery.

Through or Transhipment Bills

If the transportation involves more than one mode, namely ship, rail, road etc., then a "Through Bill" is issued. Such bills are not accepted by some bankers as they are not certain about the state in which goods will reach the consignee after all the transshipments. If the sale terms are specific about "on board" or "shipped" only such terms are to be used and transshipment bills are avoided. There has been more recently cases of exports using more than one means of transport, in India which gave rise to combined transport documents. In the case of inland container depots in Bangalore, Delhi, Guntur and Coimbatore, for example, export cargo may be loaded direct at these dry ports involving transport by land/air/sea leading to the use of combined transport documents. India was making efforts to get these documents officially recognized by the International Chamber of Commerce and U.N. bodies.

Charter Party Bill

When goods are in bulk, a shipper or a group of shippers charter a complete vessel for transport of those goods. Such bills arising out of Charger Vessels are called "Charter Party Bills". If a charter agreement is not known to a third party who has booked on this vessel, the Bills of Lading arising out of this are not so attractive to bankers as they do not know their route and destination and the time periods involved.

Negotiability of Bill of Lading

All Bills of Lading are negotiable if the terms used are "consignee or is order" or the "party or his order". The Bills are issued in triplicate – all in original and signed by the Master of the ship. When any one is used for taking delivery of goods, the others become invalid.

Airway Bills

Airway Bills is specifically designed for quick transport; it is a document of title to goods but not negotiable. They are generally made out in the name of the consignee who takes delivery and makes payment. Three parts of the Airways Bill are issued – the first part marked for "Carrier", second for the "consignee" and the third for the "consignor". While the first is signed by the "consignor" and the second is signed by both the consignor and the carrier, the third is signed by the carrier or his agent.

2. Marine Insurance Policy

As the banks are lending against goods in transport, they wish to avoid risks of loss and invariably insist on insurance. Marine insurance is done through a policy of insurance taken at a stated premium and is a quasi-negotiable instrument. This policy indemnifies the party-shipper against the normal marine losses or perils of the sea, such as damages to the vessel, or cargo by accidents or casualties, fire, jettison, natural calamities, etc. Marine insurance policy generally has a legal standing and not a certificate of insurance. The bank has to scrutinize whether there are any added clauses on the policy, the amount covered, voyages and goods covered and the risks covered and the extent of the coverage. The 'Institute Clauses' are the standard policy clauses which are included and attached and amplified in the policy to avoid misunderstanding. Such clauses are accepted by the Institute of London Underwriters.

Types of Losses

    a.   Total loss

    b.   General average loss borne proportionately by all interests at risk.

    c.   Partial loss on particular average loss but not of a general type if the ship is sunk, burnt or stranded

    d.   Losses attributed to fire, explosion, collision etc.

    e.   Discharge at a port of distress.

    f.   Special charges for landing, warehousing, forwarding etc.

(FPA) Free of Particular Average Policy

This policy covers losses or damages falling under a particular average clause. This is a minimum liability insurance and gives only partial cover for losses.

Particular Average (WPA) Clauses

This widens the range of partial losses covered above at a slightly higher premium. WPA clauses generally cover all marine losses plus General Average loses plus particular average losses if the loss is above a specified value of shipped goods and up to a percentage value of goods. This gives fuller protection than the FPA clauses.

All Risks Clause

This gives 100 per cent protection in respect of risks covered but not cover risks due to war, strikes, riots, inherent vice or damage in the goods, etc. Sometimes, arrangements are made for more than 100 per cent coverage of risks at a extra premium. As none of the above policies covers war risks, strikes, riots, if any, the party desiring to have them, has to have additional cover for them.

Warehouse to Warehouse Cover

This is a comprehensive cover called transit clause covering protection from the commencement of transit to the final destination.

Action for Claiming Indemnity

The concerned bank holding the policy should give prompt notice to insurers, carriers and all parties concerned in the event of damage or loss. A survey of the loss should be got done to assess the extent and the degree of damage and send a claim to insurers accordingly in time. The documents required to be submitted for claim either for partial loss or full loss coverage are the insurance policy, packing list, weight list, bills of lading, invoice, Master's Protest certifying any unusual happening on the voyage, survey report on the nature and extent of damage. etc.

Types of Insurance Documents

There are various types of insurance policies such as floating policy, open cover policy, specific policy, etc. Of these, specific policy is most acceptable, from the point of view of the banker.

(a) Floating Policy

A floating policy is a contract of insurance to cover a number of shipments the maximum value of which is given but the details of which such as the name of the vessel, destination, weight and specification of cargo, etc., are not declared. These details are expected to be filled in or endorsed on it later. This is not, however, valid from the point of view of the banker unless the sale terms include the tender of such an insurance certificate.

10.3 International Financial Management: Important Issues and Features, International Capital Market

This Section includes :

- **FOREIGN EXCHANGE MARKET**
  - **Eurocurrency market**
  - **Euro Credit market**
  - **International commodity market**
  - **Asian Currency Market**
  - **International Banking**
  - **Financing Foreign Trade**

INTRODUCTION :

International financial markets are a major source of funds for international transactions. Most countries have recently internationalized their financial markets to attract foreign business.

Internationalization involves both a harmonization of rules and a reduction of barriers that will allow for the free flow of capital and permit all firms to compete in all markets.

THE FOREIGN EXCHANGE MARKET :

The foreign exchange market is the market in which currencies of various countries are bought and sold against each other. The foreign exchange market is an over-the-counter market. Geographically, the foreign exchange markets span all time zones from New Zealand to the West Coast of the United States of America.

The retail market for foreign exchange deals with transactions involving travelers and tourists exchanging one currency for another in the form of currency notes or travelers cheques. The wholesale market often referred to as the interbank market is entirely different and the participants in this market are commercial banks, corporations and central banks.

Participants:

- Commercial Banks are commonly known as the "market makers" in this market. In other words, on demand, they will quote buying and selling rates for one currency against another and express willingness to take either side of the transaction. They also buy and sell on their own account and carry inventories of currencies.

- Foreign exchange brokers are essentially middlemen providing information to market making banks about prices and a counter party to transactions. Brokers do not buy or sell on their own account, instead that they have helped strike between two market making banks.

- Central banks also intervene in the markets from time to time in order to move the market in a particular direction.

- Corporations use the foreign exchange markets for many purposes. On the operational front, they use the foreign exchange markets for payments towards imports, conversion of export receipts, hedging receivables and payables position and payment of interest on foreign currency loans which they have taken. Companies that are cash rich tend to also park surplus funds and take active positions in the foreign exchange market to earn profits from exchange rate movements. There are others who, as a matter of company policy, restrict their participation to producing and selling of goods and services and only hedge their exposures.

Identification of Foreign Exchange Exposures

Foreign exchange exposures arise from many different activities. A traveler going to visit another country has the risk that if that country's currency appreciates against their own the trip will be more expensive.

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.

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.

Fund Managers and companies who own foreign assets are exposed to fall in the currencies of the countries where they own the assets. This is because if they were to sell those assets there and repatriate the money, the exchange rate would have a negative effect on the home currency value. Further, physical movement of assets from a country is more complex.

Markets that allow exchange of currencies and flow of capital across countries facilitate international business. These markets are known as international financial markets, which may take any of the following form:

- **FOREIGN EXCHANGE MARKET**
  - Eurocurrency market
  - Euro Credit market
  - International commodity market
  - Asian Currency Market
  - International Banking
  - Financing Foreign Trade

THE FOREIGN EXCHANGE MARKET :

A market where currencies are exchanged in order to buy products or invest in securities denominated in a foreign currency. The Euro Currency Market is composed of several large

banks (sometimes referred to as Euro Banks) that accept deposits and provide loans in various currencies.

Eurocurrency Markets :

Eurocurrency market consists of banks that accept deposits and make loans in foreign currencies outside the country of issue. These deposits are commonly known as Eurocurrencies. Thus, US dollars deposited in London are called Eurodollars; British pounds deposited in New York are called Eurosterling, etc.

Eurocurrency markets are very large, well organized and efficient. They serve a number of valuable purposes for multinational business operations. Eurocurrencies are a convenient money market device for MNCs to hold their excess liquidity. They are a major source of short term loans to finance corporate working capital needs and foreign trade.

Euro Credit Market:

Euro credit or Euro Loans are the loans extended for one year or longer. The market that deals in such loans is called Euro Credit Market.

Euro Bond Market:

This market caters to the long term financial needs of the international players.

International Commodity Market:

It is a market where major primary commodities are traded including price forecasts, regional price indices, transportation costs etc.

Asian Currency Market

In 1968, an Asian version of the Eurodollar came into existence with the acceptance of dollar denominated deposits by commercial banks in Singapore, which was an ideal location for the birth of the Asian currency market due to its excellent communication network, important banks and a stable government.

Asian currency market developed when the Singapore branch of the bank of America proposed that the monetary authority of Singapore relax taxes and restrictions.

International Banking

International banking has grown with the unprecedented expansion of economic activity since the world war.

International banks perform many vital tasks to help the international transactions of multinational companies. They finance foreign trade and foreign investment, underwrite international bonds, borrow and lend in the Eurodollar market, organize syndicated loans, participate in international cash management, solicit local currency deposits and loans and give information and advice to clients.

Interbank Clearing House Systems: There are three key clearing house systems of interbank fund transfers which transfer funds between banks through wire and facilitate international trade.

a. **The clearinghouse interbank payments system(CHIPS)** This is used to move dollars among New York offices of about 150 financial institutions that handle 95 percent of all foreign exchange trades and almost all Eurodollar transactions.

b. **The clearing house payments assistance system(CHPAS).** This began its operations in 1983 and provides services similar to those of CHIPS. It is used to move funds among London offices of most financial institutions.

c. **The Society for Worldwide Interbank Financial Telecommunications (SWIFT):** It is an interbank communication network which carries messages for financial transactions. It represents a common denominator in the international payment system and uses the latest communication technology. It has reduced multiplicity of formats used by banks in different parts of the world. International payments can be made very cheaply and efficiently.

Financing Foreign Trade

1. There are three major documents involved in foreign trade, namely, a draft, a bill of lading and a letter of credit.

2. Documentation in foreign trade is supposed to assure that the exporter will receive the payment and the importer will receive the merchandise. Many of these documents are used to eliminate non completion risk, to reduce forex risk and finance trade transactions.

3. A draft or bill of exchange is an order written by an exporter that requires an importer to pay a specified amount of money at a specified time. Through the draft, the exporter may use its bank as the collection agent on accounts that the exporter finances.

4. A bill of lading is a shipping document issued to an exporting firm or its bank by a common carrier which transports goods. It is simultaneously a receipt, contract and a document of title. As a receipt, the bill of lading indicates that specified goods have been received by the carrier. As a contract, it is evidence that the carrier is obliged to deliver the goods to the importer in exchange for certain charges. As a document of title, it establishes ownership of the goods. Bill of lading can be used to insure payment before the goods are delivered.

5. Letter of credit is a document issues by a bank at the request of an importer. In this, the bank agrees to honor a draft drawn on the importer if the draft accompanies specified documents such as the bill of lading. The importer asks that his local bank write a letter of credit. In exchange for the bank's agreement to honor the demand for payment that results from the import transactions, the importer promises to pay the bank the amount of the transaction and a specified fee. A letter of credit is advantageous to both exporters and importers because it facilitates foreign trade.

10.4 International Financial Services and Insurance: Important Issues and Features

This Section includes :

- **Implications of a large, rapidly growing home market for International Financial Services (IFS) in India:**
- **What drives the demand for IFS?**
- **The impact of globalization on IFS demand and on IFCs:**
- **Projections for revenue potential of Mumbai as an IFC**
- **Insurance**
- **Integration and Globalization of Financial Services:**

INTRODUCTION :

The term financial services refers to services provided by the finance industry. The finance industry encompasses a broad range of organizations that deal with the management of money. Among these organizations are commercial banks, investment banks, asset management companies, credit card companies, insurance companies, consumer finance companies, stock brokerages, and investment funds.

IMPLICATIONS OF A LARGE, RAPIDLY GROWING HOME MARKET FOR INTERNATIONAL FINANCIAL SERVICES (IFS) IN INDIA :

A little appreciated aspect of India's impressive growth from 1992 onwards is that it has resulted in even faster integration of India with the global economy and financial system. There has been a rapid escalation of two-way flows of trade and investment. Since 1992, India has globalised more rapidly than it has grown, with a distinct acceleration in globalisation after 2002. Capital flows have been shaped by:

(a) global investors in India (portfolio and direct); and

(b) Indian firms investing abroad (direct).

Indian investors - corporate, institutional and individual - have as yet been prevented from making portfolio investments abroad on any significant scale by the system of capital controls. By the same token, Indian firms have borrowed substantially abroad. But foreign firms and individuals have yet to borrow from India. Capital controls still preclude that possibility.

Despite the controls that remain, those substantially increased two-way flows, reflect an increase in demand-supply for IFS related to trade/ investment transactions in India. Put

another way, there has been an increase in IFS consumption by Indian customers and by global customers in India. Demand for IFS from both has been growing exponentially. Cumulative two-way flows in 1992-2005 were a multiple of such flows in 1947-92. The degree of 'globalisation-integration' that has occurred in the last 15 years, since reforms began in earnest, is much larger than in the 55 years between independence and India embarking on 'serious' reforms. We have made up for six lost decades of economic interaction with the world in a decade and a half. Still, what has happened over the last 15 years is a small harbinger of what is to follow over the next twenty: particularly if the current growth rate of 8% per annum is accelerated to 9-10% as is evocatively being suggested, and if India continues to open up the economy on both trade and capital flows.

The typical discussion about an Indian International Financial Services Centre (IFC) exporting IFS (especially made by those arguing for locating such an IFC in a SEZ) has been analogous to that for software exports: i.e., a sterile relationship between Indian producers and foreign customers of 'support services'. However, in the case of IFS, India is itself a large, fast growing customer of IFS. Conservative estimates of IFS consumption in India just a few years out, amount to $48 billion a year. That is more than the output of many Indian industries today.

WHAT DRIVES THE DEMAND FOR IFS?

An understanding of what drives rapidly the growing demand for IFS in India needs to take into account two features:

1. IFS demand is driven by increases in gross two-way financial flows that have occurred in transactions with the rest of the world. It is not driven by *net* flows. Demand for IFS by Indian customers - as well as foreign firms trading with and investing in India - is driven by imports *and* exports. India-related purchases of IFS are related to inbound and outbound FDI/FPI.

2. The annual growth of gross flows has accelerated dramatically in recent years. India's external linkages have been transformed since 1991-92. But that transformation has been more radical since 2002. The Indian economy is now exhibiting signs of a 'take-off' both in growth and even more rapidly in its globalisation (or integration with the world economy). *Hong Kong and China*

Hong Kong evolved as an enclave IFC to provide IFS for traders dealing with a closed China. In the 1970s and 1980s, Hong Kong had superior institutions, and provided IFS to North Asia (China, Taiwan and Korea) as well as part of ASEAN (the Philippines and Vietnam which are closer to Hong Kong than to Singapore). But, as a colonial artifice, Hong Kong's role as an IFC was compromised, if not damaged, as China opened up and connected itself to the world through Shanghai and Beijing.

Since the 1980s, China has not required its economic partners to deal with it exclusively through Hong Kong. With the gradual rise of Shanghai as an IFC, Hong Kong's role as an

IFC serving China is diminishing, although it is unlikely to be completely eclipsed. At the same time ASEAN regional finance has gravitated decisively toward Singapore.

THE IMPACT OF GLOBALIZATION ON IFS DEMAND AND ON IFCS :

When the economy of a country or region (e.g., the EU or ASEAN) engages with the world through its current and capital accounts, a plethora of IFS are purchased as part-and-parcel of these cross-border transactions. The hinterland effect of a rapidly growing national or regional economy has been a crucial driver of growth in IFCs.

The 21st century has yet to unfold. But the emergence of China and India as global economic powers is likely (as in the US, EU and ASEAN) to provide the same raison d'etre for these two economies evolving their own IFCs to interface with those that serve other regions. History suggests that no country or regional economy can become globally significant without having an IFC of its own. But the emergence of IFCs has not always been a tale of growth potential and start-up followed by prolonged competitive success in exporting IFS to global markets.

The trajectories of IFCs can wax and wane depending on how world events unfold. Growth in Indian IFS demand is driven by the progressive, inexorable integration of the Indian economy with the world economy. As such integration deepens and it triggers a variety of needs for IFS. For example:

1. Current account flows involve payments services, credit and currency risk management.

2. Inbound and outbound FDI (as well as FPI like private equity and venture capital) involves a range of financial services including investment banking, due diligence by lawyers and accountants, risk management, etc.

3. Issuance of securities outside the country involves fees being paid by Indian firms to investment bankers in IFCs around the world.

   The stock of cross-border exposure (resulting from accumulation of annual flows) requires risk management services to cover country risk, currency risk, etc. This applies in both directions: foreign investors require IFS to protect the market value of their exposure in India while Indian investors require the same services to protect the market value of their exposure outside the country.

4. The shift to import-price-parity (owing to trade reforms) implies that Indian firms that do not import or export are nevertheless exposed to global commodity price and currency fluctuations. These firms require risk management services.

5. Many foreign firms are involved in complex infrastructure projects in India. Indian firms are involved in infrastructure projects abroad. These situations involve complex IFS. The same applies to structuring and financing privatizations (especially those

involving equity sales to foreign investors) and public-private partnerships which are becoming a growing feature in infrastructure development around the world.

6. The growth of the transport industry (shipping, roads, rail, aviation, etc) involves financing arrangements for fixed assets at terminals (ports, etc.) as well as for mobile capital assets with a long life: i.e., ships, planes, bus and auto fleets, taxis, etc. That is done by specialised firms engaged in 'fleet financing'. India is now one of the world's biggest customers of aircraft buying roughly 40% of the world's new output of planes in 2006. This requires buying 40% of the world's aircraft financing services.

7. Indian individuals and firms control a growing amount of globally dispersed assets. They require a range of IFS for wealth management and asset management.

Outbound FDI by Indian firms in joint ventures and subsidiaries abroad has increased since 2004-05 as they have globalised. Foreign investments by Indian firms began with the establishment of organic presence, and acquisitions of companies, in the US and EU in the IT-related services sectors. Now they encompass pharmaceuticals, petroleum, automobile components, tea and steel. And, geographically, Indian firms are spreading well beyond the US and EU by establishing a direct presence or acquiring companies in China, ASEAN, Central Asia, Africa and the Middle East. Such outward investments are funded through: draw-down of foreign currency balances held in India, capitalization of future export revenue streams, balances held in EEFC accounts, and share swaps.

Outward investments are also financed through funds raised abroad: e.g., ECBs, FCCBs and ADRs/GDRs. Leveraged buy-outs related to these investments and executed through SPVs abroad are not captured in the overseas investment transactions data. The Tata Steel-Corus transaction, for example, involved substantial IFS revenues going to financial firms in Singapore and London.

When two firms across the globe agree to undertake current or capital account buy-sell transactions, the associated IFS are usually bought by the firm with better access to high quality, low cost IFS. Consider the example of an Indian firm exporting complex engineering goods to a firm in Germany. It can contract and invoice in: INR, USD or EUR. Because India has limited IFS capabilities, and a stunted currency trading market, the transaction is likely to be contracted in INR or USD. But the German importer generates revenues in EUR. It has to buy INR or USD to pay the Indian firm. It may have to use a currency derivative (future, forward or option) to cover the risk of a movement in the exchange rate of the INR or USD vs. the EUR between placing the order and receiving the goods. This would typically be done in London.

However, if India had a proper currency spot and derivatives market, the Indian exporter would be able to invoice in EUR. Local IFS demand would be generated by this local firm converting locked-in future EUR revenues into current INR revenues at a known exchange rate. Indian exporters are not as flexible as they wish to be in their choice of the INR or of global currencies for invoicing (i.e., USD, JPY, EUR or GBP) - or even the choice of currencies

such as the SGD or CNY for trade with ASEAN and China. If they were, that could influence the effective price received by them. When goods are sold by an Indian exporter, and a German importer pays IFS charges in London for converting EUR into INR and managing the exchange risk, the net price received by the Indian exporter is lower. When the Indian exporter sells in EUR, and local IFS are purchased for conversion of EUR receipts into INR, the price received would be higher.

These differences are invisible in standard BoP data, which do not separate out and recognise charges for IFS being purchased or sold as part and parcel of contractual structures on the current or the capital account. For this reason, the standard BoP data grossly understate the size and importance of the global IFS market. Focusing on the transactional aspects of trade flows would tend to understate IFS demand since this tends to ignore the risk management business which rides on trade flows.

PROJECTIONS FOR REVENUE POTENTIAL OF MUMBAI AS AN IFC :

The median (base case) projections involve IFS demand in India rising from $13 billion in 2006 to $ 48 billion in 2015. A low-case assumption would see IFS consumption rising from US$ 6.6 to nearly US$ 24 billion over the same period. A more optimistic (but not implausible) 'high-case' assumption would see it grow from US$ 19.7 to nearly US$ 72 billion.

INSURANCE :

Finance and insurance have much in common. Each provides its customers with tools for managing risks. The valuation techniques in both finance and insurance are formally same: The fair value of a security and an insurance policy is the discounted expected value of the future cash flows they provide to their owners. The definition of risk is the same: The variation of future results (cash flows) from expected values. Finally, the management of insurable and financial risks rely on the same two fundamental concepts: risk pooling and risk transfer.

Since the early 1990's, we have seen substantial convergence between finance and insurance. A shortage of property and liability insurance in the 1980s forced many corporate insurance customers to consider alternatives to traditional insurance, such as selfinsurance, captive insurers, and contingent borrowing arrangements to finance losses. Investment bankers and insurance brokers provided many of these alternatives. The demand for catastrophe insurance in the 1990s led to the development of options and futures for this type of insurance. Investment banks, sometimes with insurance company or insurance broker partners, formed subsidiaries to offer catastrophe and other high-demand coverage through new financing arrangements.

Life insurers have developed products with embedded options on stock portfolios. Insurers have begun to use structured securities, such as bonds with indexed coupons, in their investment portfolios.

Thus, in the 1990s, financial markets offered products for managing risks traditionally handled by insurers. The high demand for catastrophe insurance on property started the movement.

We now see convergence in the investment markets as well as in various new alliances, partnerships and joint ventures.

INTEGRATION AND GLOBALIZATION OF FINANCIAL SERVICES :

Changing customer needs, more knowledgeable and demanding customers, new technology, liberalization, deregulation, and a combination of other forces are blurring the lines between financial products, institutions, sectors, and countries. Regulators are responding to market pressures by allowing more inter-sectoral competition. Banks, securities firms, insurance companies, and other financial intermediaries increasingly compete with each other by offering similar products and services and by entry into fields previously reserved for one sector only.

Financial services integration occurs when financial products and services traditionally associated with one class of financial intermediaries and distributed by another class of financial intermediaries.

Financial services convergence is the tendency of financial products and services traditionally one sector to take on characteristics traditionally observed with financial products and services of another financial services sector.

Convergence occurs through customer demand across traditional sector lines. Examples include the introduction by insurance companies of variable (unit linked) life and annuity products that contain both insurance and securities features. Another burgeoning area is the banking industry's creation of securitized mortgage and corporate debt portfolios, which involves packaging a group of mortgages or other loans into marketable securities that are sold to investors.

As banks, securities firms, and insurers construct products and offer services that resemble the features of their competitors, product convergence will be an important driving force toward financial services integration.

This integration gave birth to financial services conglomerates. A Financial services conglomerate is a firm or group of firms under common control which offers financial services that extend beyond the traditional boundaries of any one sector. The two most commonly discussed arrangements are bancassurance and universal banks.

Bancassurance describes arrangements between banks and insurers for the sale of insurance through banks, wherein insurers are primarily responsible for production and banks are primarily responsible for distribution.

Universal banks are financial intermediaries that typically offer commercial and investment banking services, and also insurance.