MP-107

Vardhaman Mahaveer Open University, Kota

Financial Management

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Introduction

The present course aims to give an introduction of Financial Management for the purpose of managing financial resources effectively.

Block I : Conceptual framework gives a brief note on meaning, nature, objectives and scope of financial management. It also highlights the functions of a finance manager.

Block II: Working capital management describes the concept, need, types, determinants, measurement and financing of working capital.

Block III: Cost of capital and capital structure consists of units focussing upon cost of capital, MM theory, analysis of EBIT and EPS, Cost-volume-profit analysis, Leverage analysis and sources of long-term finance.

Block IV: Capital Budgeting highlights issues related to time value of money, capital budgeting methods and risk analysis.

Block V: Management of Earnings covers the units related to dividend policy and dividend models.

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Financial Management

UNIT - 1 : FINANCIAL MANAGEMENT : AN INTRODUCTION

Unit Structure

1.0 Objectives

After studying this unit, you should be able to understand:

- The concept of Financial Management
- The nature and scope of Financial Management
- The objectives of Financial Management
- The Functions of a Finance Manager

1.1 Introduction

The finance manages handles finance and his role pivoted. He can change the fortunes of the organization with proper monitoring and timely guidance. Equally of the managet is not competent, even a prog. The organization may dwindle or even sink. The role of finance manager in a modern business is pervasive in all the activities of business firm including marketing and production, it has been rightly said, money begets money. business needs money to make more money.

Financial management in nothing but management of the limited financial resources the organization has to its utmost advantage. Resources are always limited compared in demand or needs. This is the case with every type of organization

Finance is the life blood of business. It is as important for trade, industry and commerce as lubricant for wheels, marrow for bones and blood for arteries. Finance is required for establishing, developing and operating the business efficiently. Without proper financing, even the best project remains a futile exercise and if the project is put into operation, later on, many problems crop up in its execution and control.

Financial Management is that specialized function of general management which is related to the procurement of finance and its effective utilization for the achievement of common goal of the organization. It includes each and every aspect of financial activity in the business. Financial Management has been defined differently by different scholars. A few of the definitions are being reproduced below:-

"Financial Management is an area of financial decision making harmonizing individual motives and enterprise goals."- *Weston and Brigam.*

"Financial Management is the application of the planning and control functions to the finance function."- *Howard and Upton.*

"Financial Management is the operational activity of a business that is responsible for obtaining and effectively utilizing the funds necessary for efficient operations."- *Joseph and Massie.*

From the above definitions, it is clear that financial management is that specialised activity which is responsible for obtaining and affectively utilizing the funds for the efficient functioning of the business and, therefore, it includes financial planning, financial administration and financial control.

1.2 Nature and Scope of Financial Management

The term financial management has emerged from the generic discipline of management. In order to understand financial management, it is better to start with an understanding the term management. Management, simply put, is all about securing the optimal use of the resources at the disposal of the firm towards the attainment of some predetermined goals. These resouces are of many kinds such as human capital, production machines, distribution channels etc.Resources are put under the charge of respective departments which have the responsibility of their management and control. Each department contributes towards the organisational objectives by effectively managing the resources they are controlling. Many terms such as capital, funds, cash flow, money etc. are used synonmously and interchangeably to describe financial resources. The finance department of the organisation is responsible for the financial management of the firm, which it does through the means of financial decision making.

Financial management performs facilitation, reconciliation, and control function in an organisation. The sourcing of finances needed by various departments and its rational allocation for various activities is done by finance department. This facilitates the attainment of various departmental goals along with the realization of the overall organisational goals. The rational and balanced allocation of resources done by the finance department reconciles the interest of various departments and pre- empts any kind of conflicts for resouces that may occur between various departments of an organisation. Also, the finance department maintains a constant control over the various activities of the organisation and makes different departments acountable for the resources that they consume.

All decisions that have monetary implications come under the purview of financial management. To the extent, purely functional decisions such as the decision to launch a major advertising campaign or to go ahead with a comprehensive training programme for the middle level managers are related to marketing and HR functions, but due to their financial implications, such decisions require ratification by the finance department. This widens the scope of financial decision making to almost all the decisions. It is due to this fact that it is said that 'the finance manager is on the top and not on the tap'.

The characteristics of the financial management are:

1. **Essential part of business management:** Financial management is an integral part of an organizational management. Each and every department in an organisation have to prepare a budget and provide it to the top management for designing the capital structure of the firm and identifying the sources of raising the funds.
2. **Continuous administrative function:** Management of funds is a year long practice. The departmental heads need to prepare the estimates about the requirements of the funds and plan the use of resources accordingly.
3. **Scientific and analytical function:** Robbins have treated financial management as both science as well as art and said, "Managing firm's finance is both art and science. it requires not only a feel

for the situation and analytical skill , but also a thorough knowledge of the techniques and tools of financial analysis and the knowledge to apply them and interpret the results.

4. **Centralized nature of operation:** The financial management or finance function is basically a centralized nature of all functional areas of management, because the objectives of the business can be achieved more effectively by centralization of finance function. Therefore, decentralization of finance function is not desirable like other function of the enterprise. According to Vance " Functional areas such as marketing and production are decentralized in the modern industrial concerns but financial coordination and control are achieved through centralization." The finance function in a business can be compared to that of human heart whose basic nature is centralized

5. **Different from accounting function:** Most of the persons regard accounting and finance as the same thing due to use of many terms and financial records but finance function is different from accounting function. Accounting is basically involved with the data accumulation while finance is primarily involved with data analysis for use in decision making.

6. **Wide scope:** According to Raymond and Robert, the scope of financial management is very wide and complex. Like old days the scope of financial management is not confined to raise capital for meeting long term requirements of the enterprise but, acquiring of funds for short and long term needs of the enterprise. Proper allocation of funds and there optimum utilization are also within its scope. Moreover it is also responsible for accounting, capital budging, audit, cost control, cash and credit control and other routine function

7. **Applicable to all types of organization:** Financial management is applicable to all types of manufacturing and service organisation whatever may be their size, nature, ownership and control. It is wrong to say that financial management can be applied only to those organisations whose basic aim is to earn profits. Raymond have aptly said "the term financial management may be applied to any kind of undertaking or organisation regardless of its aims or constitution".

1.3 Objectives of Financial Management

The financial management is generally concerned with procurement, allocation and control of financial resources of a concern. The objectives can be-

1. To ensure regular and adequate supply of funds to the concern.
2. To ensure adequate returns to the shareholders, this will depend upon the earning capacity, market price of the share, expectations of the shareholders.
3. To ensure optimum funds utilization. Once the funds are procured, they should be utilized in maximum possible way at least cost.
4. To ensure safety on investment, i.e., funds should be invested in safe ventures so that adequate rate of return can be achieved.
5. To plan a sound capital structure-There should be sound and fair composition of capital so that a balance is maintained between debt and equity capital.

1.4 Functions of A Finance Manager

The twin aspects viz. procurement and effective utilization of funds are the crucial tasks which the finance manager faces. The financial manager is required to look into the financial implications of any decision in the firm. Thus all decisions involving management of funds comes under the preview of the finance manager. A large number of decisions involve substantial or material changes in the value of funds procured or employed. The finance manager has to manage funds in such a way so as to make their optimum utilization and to ensure that their procurement is in a manner so that the risk, cost and control considerations are properly balanced under a given situation. He may not however, be concerned with the decisions, which do not affect the basic financial management and structure.

It is pertinent here to distinguish between the nature of job of the finance manager and that of the accountant. An accountant's job is primarily to record the business transactions, prepare financial statements which show the working results of the organisation for a given period and its financial condition at a given point of time. He has to record the various happenings in monetary terms to ensure that assets, liabilities, incomes and expenses are properly grouped, classified and disclosed in the financial statements. The accountant is not concerned with management of funds which is a specialized task though historically many accountants have been managing funds also. In the modern day business, since the size of the business has grown enormously the finance function is a separate one and is a complex task. The finance manager has a task entirely different from that of the accountant. He has to manage funds. This involves a number of important decisions. Some of these have been listed below:

1. **Estimating the requirements of funds:** In a business the requirements of funds have to be carefully estimated. Certain funds are required for long term purposes i.e., investment in fixed assets, etc. A careful estimate of such funds and of the exact timing when such funds are required must be made. Also an assessment has to be made regarding requirements of working capital which involves estimating the amount of funds blocked in various current assets and the amount of funds likely to be generated for short periods through current liabilities. Forecasting the requirements of funds involves the use of techniques of budgetary control and long range planning. Estimates of requirements of funds can be made only if all the physical activities of the organisation have been forecasted. They can then be translated into monetary terms.

2. **Decision regarding capital structure:** Once the requirement of funds has been estimated, a decision regarding various sources from where these funds would be raised has to be taken. A proper mix of the various sources has to be worked out. As we have seen earlier, each source of funds involves different issues for consideration. In this context, the finance manager has to carefully look into the existing capital structure and see how the various proposals of raising funds will affect it. He has to maintain a proper balance between long-term funds and short-term funds. He has to ensure that he raises sufficient long-term funds in order to finance fixed assets and other long-term investments and to provide for the permanent needs of working capital. Within the total volume of long-term funds, he has to maintain a proper balance between the loan funds and own funds. Long-term funds raised from outsiders have to be in a certain proportion with the funds procured from the owners. There are various options available for procuring outside long term funds also. The finance manager has to decide the ratios between outside long term funds and own funds. He has also to see that the overall capitalization of the company is such that the company is able to

procure funds at minimum cost and is able to tolerate shocks of lean periods. All such kinds of decisions are termed as 'financing decisions'.

3. **Investment decision:** Funds procured from different sources have to be invested in various kinds of assets. Long term funds are used in a project for various fixed assets and also for current assets. The investment of funds in a project has to be made after careful assessment of the various projects through capital budgeting. A part of long term funds is also to be kept for financing the working capital requirements. Asset management policy would be determined by the production manager and the finance manager keeping in view the requirement of production and the future price estimates of raw materials and the availability of funds.

4. **Dividend decision:** The finance manager is also concerned with the decision to pay or declare a dividend. He has to assist the top management in deciding as to what amount of dividend should be paid to the shareholders and what amount should be retained in the business itself. This involves a large number of considerations. Economically speaking, the amount to be retained or to be paid to the shareholders should depend on whether the company or the shareholders can make a more profitable use of the funds. However, in market prices, the requirement of funds for future growth, the cash flow situation, the tax position of share-holders, etc., are to be kept in mind.

   The principal function of a finance manager relate to decisions regarding procurement, investment and dividends. However, the finance manager also undertakes the following subsidiary function.

5. **Supply of funds to all parts of the organisation or cash management:** The finance manager has also to ensure that all section i.e., branches, factories, departments and units of the organisation are supplied with adequate funds. Sections which have an excess of funds have to contribute to the central pool for use in other sections which need funds. An adequate supply of cash at all points of time is absolutely essential for the smooth flow of business operations. Even if one of the 200 retail branches does not have sufficient funds, the whole business may be danger. Hence the need for laying down cash management and cash disbursement policies with a view to supplying adequate funds at all times and at all points in an organisation is an important function of finance manager. Cash management should also ensure that there is no excessive cash.

6. **Evaluating financial performance :** Management control systems are often based upon financial analysis. One prominent example is the ROI (return on investment) system of divisional control. A finance manager has to constantly review the financial performance of the various units of the organisation. The ROI chart is extremely useful in this regard. Analysis of the financial performance helps the management for assessing how the funds have been utilized in various divisions and what can be done to improve it.

7. **Financial negotiations:** A major portion of the time of the finance manager is utilised in carrying out negotiations with the financial institutions, banks, and public depositors. He has to furnish a lot of information to these institutions and persons and has to ensure that rising of funds is within the statutes like Companies Act, etc. Negotiations for outside financing often require specialized skills.

1.5 Summary

Financial management is the ways and means of managing money i.e. the determination, acquisition, allocation and utilization of financial resources usually with the aim of achieving some particular goals or objectives. A finance manager needs three important decisions i.e. financing decision, investment decision and dividend decision

The functions of the finance manager is to estimate the requirement of funds, taking decisions regarding capital structure, investment decisions, dividend decisions, cash management, evaluating financial performance, financial negotiations, analyzing the trends in stock markets and behavior of share prices.

1.6 Key Words

- **Financial Management:** It is the planning, organizing, directing and controlling of the procurement and utilization of funds and safe disposal of profit to the end that individual, organizational and social objectives are accomplished.
- **Financing Decision:** finance decision is concerned with the composition or mix of the sources of raring the funds required by the firm.
- **Investment Decision:** it relates to selection of anets in which funds are to be inverted by the firm.
- **Dividend Decision:** Dividend decision is concerned with the amount of profit to be distributed and retained in the firm.

1.7 Self Assessment Test

1. What is financial management?
2. Write a note on nature and scope of financial management.
3. Discuss the important functions of finance manager.

UNIT - 2 : PROFIT V/S WEALTH MAXIMISATION

Unit Structure

2.0 Objectives

After studying this unit, you should be able to understand:

- Objectives of firm classified into profit maximisation and wealth maximisation.
- How to maximize owners' economic welfare.
- Shortcomings of Profit maximisation decision criterion.

2.1 Introduction

Financial management is concerned with the procurement and inductions use of funds. Its main aim is to maximize the earnings and value of the equity should have a goal or objective to achieve. In the context of that objectives, the finance manages eralath the decisions to be taken. Seresal goods of financial management have been cited and the problem in to idently one of there several goods. It is generally of rew that the financial good of the firm should be the maximization of owner's economic welfare. Owner's economics welfare can be maximized with the shareholder's wealth maximization as rejection in the market value of the equity Shana.

2.2 'Objectives' of a firm

To make wise decisions a clear understanding of the objectives which are sought to be achieved is necessary. The objective provides a framework for optimum financial decision making. In other words, they are concerned with designing a method of operating the internal investment and financing of a firm. The term 'objective' is used in the sense of a goal or **decision criterion** for the three decisions involved in financial management. It implies that what is relevant is not the overall objective or goal of a business but an operationally useful criterion by which to judge a specific set of mutually interrelated business decisions, namely, investment, financing and dividend policy. Moreover, it provides a normative framework. That is, the focus in financial literature is on what a firm should try to achieve and on policies that should be followed if certain goals are to be achieved. The implication is that these are not necessarily followed by firms in actual practice. They are rather employed to serve as a basis for theoretical analysis and do not reflect contemporary empirical industry practices. Thus, the term is used in rather narrow sense of what a firm *should attempt* to achieve with its investment, financing and dividend policy decisions.

Firms in practice state their vision, mission and values in broad terms and are also concerned about technology, leadership, productivity, market standing, image, profitability, financial resources, employees satisfaction and so on. Some illustrations of mission and values/corporate purpose/vision for future are depicted in Exhibits 3.1 and 3.2.

Exhibit 2.1: Ranbaxy's Missions and Values

MISSION

- To become a research-based International Pharmaceutical Company.

VALUES

- Achieving customer satisfaction is fundamental to our business.
- Provide products and services of the highest quality.
- Practice dignity and equity in relationships and provide opportunities for our people to realize their full potential.
- Ensure profitable growth and enhance wealth of the shareholders.
- Foster mutually beneficial relations with all our business operations.
- Manage our operations with high concern for safety and environment.
- Be a responsible corporate citizen.

Exhibit 2.2: HLL's Corporate Purpose

- Our purpose in Unilever is to meet the everyday needs of people everywhere-to anticipate the aspirations of our consumers and customers and to respond creatively and competitively with branded products and services which raise the quality of life.
- Our deep roots in local cultures and markets around the world are our unparalleled inheritance and the foundation for our future growth. We will bring our wealth of knowledge and international expertise to the service of local customer-a truly multi-local multinational.
- Our long-term success requires a total commitment to exceptional standards of performance and productivity, to working together effectively and to a willingness to embrace new ideas and learn continuously.
- We believe that to succeed requires the highest standards of corporate behaviour towards our employees, consumers and the societies and world in which we live.
- This is Unilever's road to sustainable, profitable growth for our business and long-term value creation for our shareholders and employees.

2.3 Profit Maximisation Decision Criterion

We discuss the alternative approaches in financial literature. There are two widely-discussed approaches: (i) Profit (total)/Earning Per Share (EPS) maximisation approach, and (ii) Wealth Maximisation approach.

According to this approach, actions that increase profits (total)/EPS should be undertaken and those that decrease profits/EPS are to be avoided. In specific operational terms, as applicable to financial management, the profit maximisation criterion implies that the investment, financing and dividend policy decisions of a firm should be oriented to the maximisation of profits/EPS.

The term 'profit' can be used in **two** senses. As an owner-oriented concept, it refers to the amount and share of national income which is paid to the owners of business, that is, those who supply equity capital. As a *variant,* it is described as **profitability**. It is an operational concept and signifies economic efficiency. In other words, profitability refers to a situation where output exceeds input, that is, the value created by the use of resources is more than the total of the input resources. Used in this sense, profitability maximisation would imply that a firm should be guided in financial decision by one test; select assets, projects and decisions which are profitable and reject those which are not. In the current financial literature, there is a general agreement that profit maximisation is used in the second sense.

The rationale behind profitability maximisation, as a guide to financial decision making, is simple. Profit is a test of economic efficiency. It provides the yardstick by which economic performance can be judged. Moreover, it leads to efficient allocation of resources, as resources tend to be directed to uses which in terms of profitability are the most desirable. Finally, it ensures maximum social welfare. The individual search for maximum profitability provides the famous 'invisible hand' by which total economic welfare is maximized. Financial management is concerned with the efficient use of an important economic resource (input), namely, capital. It is, therefore, argued that profitability maximisation should serve as the basic criterion for financial management decisions.

The profit maximisation criterion has, however, been questioned and criticized on several grounds. The reasons for the opposition in academic literature fall into two broad groups: (1) those that are based on misapprehensions about the workability and fairness of the private enterprise itself, and (2) those that arise out of the difficulty of applying this criterion in actual situations. It would be recalled that the term objective, as applied to financial management, refers to an explicit operational guide for the internal investment and financing of a firm and not the overall goal of business operations. We, therefore, focus on the second type of limitations to profit maximisation as an objective of financial management. The *main* technical flaws of this criterion are **ambiguity, timing of benefits,** and **quality of benefits.**

Ambiguity One practical difficulty with profit maximisation criterion for financial decision making is that the term profit is a vague and ambiguous concept. It has no precise connotation. It is amenable to different interpretations by different people. To illustrate, profit may be short-term or long term, it may be total profit or rate of profit; it may be before tax or after tax; it may return on total capital employed or total assets or shareholders equity and so on. If profit maximisation is taken to be the objective, the question arises, which of these variants of profit should a firm try to maximize? Obviously, a loose expression like profit cannot form the basis of operational criterion for financial management.

Timing of Benefits A more important technical objection to profit maximisation, as a guide to financial decision making, is that it ignores the differences in the time pattern of the benefits received over the working life of the asset, irrespective of when they were received. Consider Table 1.

Table - 1 : Time-Pattern of Benefits (Profits)

Time	Alternative A (Rs. in lakh)	Alternative B (Rs. in lakh)
Period I	50	-
Period II	100	100
Period III	50	100
Total	**200**	**200**

It can be seen from Table -1 that the total profits associated with the alternatives, A and B, are identical. If the profit maximisation is the decision criterion, both the alternatives would be ranked equally. But the returns from both the alternatives differ in one important respect, while alternative A provides higher returns in earlier years, the returns from alternative B are larger in later years. As a result, the two alternative courses of action are not strictly identical. This is primarily because a basic dictum of financial planning is **the earlier the better** as benefits received sooner are more valuable than benefits received later. The reason for the superiority of benefits now over benefits later lies in the fact that the former can be

reinvested to earn a return. This is referred to as time value of money. The profit maximisation criterion does not consider the distinction between returns received in different time periods and treats all benefits irrespective of the timing, as equally valuable. This is not true in actual practice as benefits in early years should be valued more highly than equivalent benefits in later years: the assumption of equal value is inconsistent with the real world situation.

Quality of benefits Probably the most important technical limitation of profit maximisation as an operational objective is that it ignores the quality aspect of benefits associated with a financial course of action. The term quality here refers to the degree of certainty with which benefits can be expected. As a rule, the more certain the expected return, the higher is the quality of the benefits. Conversely, the more uncertain/fluctuating is the expected benefits, the lower is the quality of the benefits. An uncertain and fluctuating return implies **risk** to the investors. It can be safely assumed that the investors are **risk-averters**, that is, they want to avoid or at least minimize risk. They can, therefore, be reasonably expected to have a preference for a return which is more certain in the sense that it has smaller variance over the years.

The problem of uncertainty renders profit maximisation unsuitable as an operational criterion for financial management as it considers only the size of benefits and gives no weight to the degree of uncertainty of the future benefits. This is illustrated in Table - 2

Table - 2 : Uncertainty About Expected Benefits (Profits)

Profit (Rs. Crore) State of Economy	Alternative A	Alternative B
Recession (Period I)	**9**	**0**
Normal (Period II)	**10**	**10**
Boom (Period III)	**11**	**20**
Total	**30**	**30**

It is clear from table 2 that the total returns associated with the two alternatives are identical in a normal situation but the range of variations is very wide in case of alternative B, while it is narrow in respect of alternative A. To put it differently, the earnings associated with alternative B are more uncertain (risky) as they fluctuate widely depending on the state of the economy. Obviously, alternative A is better in terms of risk and uncertainty. The profit maximisation criterion fails to reveal this.

To conclude, the profit maximisation criterion is inappropriate and unsuitable as an operational objective of investment, financing and dividend decisions of a firm. It is not only vague and ambiguous but it also ignores two important dimensions of financial analysis, namely, risk, and time value of money. It follows from the above that an appropriate operational decision criterion for financial management should:

(i) be precise and exact;
(ii) be based on the '**bigger the better**' principle;
(iii) consider both quantity and quality dimensions of benefits; and
(iv) recognize the time value of money.

The alternative to profit maximisation, that is, wealth maximisation is one such measure.

2.4 Wealth Maximisation Decision Criterion

This is also known as value maximisation or net present worth maximisation. In current academic literature value maximisation is almost universally accepted as an appropriate operational decision criterion for financial management decision as it removes the technical limitations which characterize the earlier profit maximisation criterion. Its operational features satisfy all the three requirements of a suitable operational objective of financial course of action, namely, exactness, quality of benefits and the time value of money.

The value of an asset should be viewed in terms of the benefits it can produce. The worth of a course of action can similarly be judged in terms of the value of the benefits it produces less the cost of undertaking it. A significant element in computing the value of a financial course of action is the precise estimation of the benefits associated with it. The wealth maximisation criterion is based on the concept of cash flows generated by the decision rather than accounting profit which is the basis of the measurement of benefits in the case of the profit maximisation criterion. Cash-flow is a precise concept with a definite connotation. Measuring benefits in terms of cash flows avoids the ambiguity associated with accounting profits. This is the first operational feature of the net present worth maximisation criterion.

The second important feature of the wealth maximisation criterion is that it considers both the quantity and quality dimensions of benefits. At the same time, it also incorporates the time value of money. The operational implication of the uncertainty and timing dimensions of the benefits emanating from a financial decision is that adjustments should be made in the cash-flow pattern, firstly, to incorporate risk and, secondly, to make an allowance for differences in the timing of benefits. The value of a stream of cash flows with value maximisation criterion is calculated by discounting its element back to the present at a capitalization rate that reflects both time and risk. The value of a course of action must be viewed in terms of its worth to those providing the resources necessary for its undertaking. In applying the value maximisation criterion, the term **value** is used in terms of worth to the owners, that is, ordinary shareholders. The **capitalization (discount) rate** that is employed is, therefore, the rate that reflects the time and risk preferences of the owners or suppliers of capital. As a measure of quality (risk) and timing, it is expressed in decimal notation. A discount rate of, say, 15% is written as 0.15. A large capitalization rate is the result of higher risk and longer time period. Thus, a stream of cash flows that is quite certain might be associated with a rate of 5%, while a very risky stream may carry a 15% discount rate.

For the above reasons, the net present value maximisation is superior to the profit maximisation as an operational objective. As a decision criterion, it involves a comparison of value to cost. An action that has a discounted value-reflecting both time and risk-that exceeds its cost can be said to create value. Such actions should be undertaken. Conversely, actions, with less value than cost, reduce wealth and should be rejected. In the case of mutually exclusive alternatives, when only one has to be chosen, the alternative with the greatest net present value should be selected. In the words of Ezra Solomon,

The gross present worth of a course of action is equal to the capitalized value of the flow of future expected benefit, discounted (or capitalized) at a rate which reflects their certainty or uncertainty. Wealth or net present worth is the difference between gross present worth and the amount of capital investment required to achieve the benefits being discussed. Any financial action which creates wealth or which has a net present worth above zero is a desirable one and should be undertaken. Any financial action which does not meet this test should be rejected. If two or more desirable courses of action are mutually exclusive (i.e. if only one can be undertaken), then the decision should be to do that which creates most wealth or shows the greatest amount of net present worth.

Using Ezra Solomon's symbols and methods, the net present worth can be calculated as shown below:

(i) $$W = V - C \qquad (1.1)$$

Where W = Net Present Worth

V = Gross Present Worth

C = Investment (equity capital) required to acquire the asset or to purchase the course of action

(ii) $$V = E/K \qquad (1.2)$$

Where E = Size of future benefits available to the suppliers of the input capital

K = The capitalization (discount) rate reflecting the quality (certainty/uncertainty) and timing of benefits attached to E

(iii) $$E = G - (M + I + T) \qquad (1.3)$$

Where G = Average future flow of gross annual earnings expected from the course of action, before maintenance charges, taxes and interest and other prior charges like preference dividend

M = Average annual reinvestment required to maintain G at the projected level

T = Expected annual outflow on account of taxes

I = Expected flow of annual payments on account of interest, preference dividends and other prior charges

The operational objective of financial management is the maximisation of W in Eq. (1.1). Alternatively, W can be expressed symbolically by a short-cut method as in Eq. (1.4). Net present value (worth) or wealth is

$$W = \frac{A_1}{(1+K)} + \frac{A_2}{(1+K)^2} + \ldots\ldots + \frac{A_n}{(1+K)^n} - C \qquad (1.4)$$

Where, $A_1, A_2, \ldots A_n$ represents the stream of cash flows expected to occur from a course of action over a period of time;

K is the appropriate discount rate to measure risk and timing; and

C is the initial outlay to acquire that asset or pursue the course of action.

It can, thus, be seen that in the value maximisation decision criterion, the time value of money and handling of the risk as measured by the uncertainty of the expected benefits is an integral part of the exercise. It is, moreover, a precise and ambiguous concept, and therefore, an appropriate and operationally feasible decision criterion for financial management decisions.

It would also be noted that the focus of financial management is on the value to the owners or suppliers of equity capital. The wealth of the owners is reflected in the market value of shares. So wealth maximisation implies the maximisation of the market price of shares. In other words, maximisation of the market price of shares is the operational substitute for value/wealth/net present value maximisation as a decision criterion.

2.5 Summary

In brief, what is relevant is not the overall goal of a firm but a decision criterion which should guide the financial course of action. Profit/EPS maximisation was initially the generally accepted theoretical criterion for making efficient economic decisions, using profit as an economic concept and defining profit maximisation as a criterion for economic efficiency. In current financial literature, it has been replaced by the wealth maximisation decision criterion because of the shortcomings of the former as an operational criterion, as

(i) it does not take account of uncertainty of risk,
(ii) it ignores the time value of money, and
(iii) it is ambiguous in its computation.

Owing to these technical limitations, profit maximisation cannot be applied in real world situations. Its modified form is the value maximisation criterion. It is important to note that value maximisation is simply extension of profit maximisation to a world that is uncertain and multiperiod in nature. Where the time period is short and degree of uncertainty is not great, value maximisation and profit maximisation amount to essentially the same thing.

However, two important issues are related to the value/share price maximisation, namely, **economic value added** and **focus on stakeholders.**

Economic Value Added (EVA) : It is a popular measure currently being used by several firms to determine whether an existing/proposed investment positively contributes to the owners'/shareholders' wealth. The EVA is equal to after-tax operating profits of a firm less the cost of funds used to finance investments. A positive EVA would increase owners' value/wealth. Therefore, only investments with positive EVA would be desirable from the view point of maximizing shareholders' wealth. To illustrate, assuming and after-tax profit of Rs. 40 Crore and associated costs of financing the investments of Rs. 38 Crore, the EVA = Rs. 2 Crore (Rs. 40 Crore – Rs. 38 Crore). With a positive EVA, the investment would add value and increase the wealth of the owners' and should be accepted. The computation of the after-tax operating profits attributable to the investment under consideration as well as the cost of funds used to finance it would, however, involve numerous accounting and financial issues.

The **merits** of EVA are:

(a) its relative simplicity; and
(b) its strong link with the wealth maximisation of the owners.

It *prima facie* exhibits a strong link to share prices, i.e., positive EVA is associated with increase in prices of shares and *vice versa*. However, EVA is, in effect, a repackaged and well-marketed application of the NPV technique of investment decision. But EVA is certainly a useful tool for operationalising the owners' value maximisation goal, particularly with respect to the investment decision.

Focus on Stakeholders: The shareholders wealth maximisation as the primary goal notwithstanding, there is a broader focus in financial management to include the interest of the stakeholders as well as the shareholders. The stakeholders include employees, customers, suppliers, creditors and owners and others who have a direct link to the firm. The implication of the focus on stakeholders is that a firm should avoid actions detrimental to them through the transfer of their wealth to the firm and, thus, damage their wealth. The goal should be preserve the well-being of the stakeholders and not to maximize it.

The focus on the stakeholders does not, however, alter the shareholder's wealth maximisation goal. It tends to limit the firm's action to preserve the wealth of the stakeholders. The stakeholders view is considered part of its "social responsibility" and is expected to provide maximum long-term benefit to the shareholders by maintaining positive stakeholder relationship which would minimize stakeholder turnover, conflict and litigation. In brief, a firm can better achieve its goal of shareholder's wealth maximisation with the cooperation of, rather than conflict with, its other stakeholders.

2.6 Key Words

- **Quality:** refers to the degree of certainty with which benefits can be expected.
- **Risk** is the chance that actual outcomes may differ from those expected.
- **Risk-averters** want to avoid risk.

- **Economic value added** is equal to after-tax operating profits of a firm less the cost of funds used to finance investments.
- **Stakeholders** include groups such as employees, customers, suppliers, creditors, owners and others who have a direct link to the firm.

2.7 Self Assessment Test

1. Explain "Profit maximisation" and "Wealth maximisation" objectives of firm.
2. Comment on "Objectives of firm:- Profit maximisation V/s Wealth maximisation".
3. Write short note on:

   (a) Economic Value Added
   (b) Stakeholders

UNIT - 3 : WORKING CAPITAL MANAGEMENT

Unit Structure

3.0 Objectives

After Study of this unit, reader will be able to:

- Explain the meaning of working capital
- Understand the importance of working capital in an organization
- Identify different types of working capital
- Understand the methodology followed to measure working capital requirements
- Identify the Determinants of working capital requirements
- Decribe the sources of finance for working capital
- List out the issues Involved in working capital management

3.1 Introduction

One o the main roles of finance manager in a company is to identify the financial requirements if the organization and then to identify the sources and arrange finance to meet those requirement with the objectives to maximize the wealth of the shareholders. The financial requirements of the company. On the basis of time, can be classified into two main categories i.e. Fixed capital and working capital. Fixed capital is the long term capital of the company whereas working capital involves short term funds requirements. In this unit we will focus on various aspects of the working capital employed by the organization to meet its short term funds. Working capital is the capital employed by the organization to meet its short term funds requirement. Working capital is also known as the circulating capital and its role can be compared with the role being played by blood in the human body. As we cannot imagine life without blood, similarly we cannot think of an organization without working capital. However depending upon the nature of business importance of working capital can be comparatively less or more.

Working Capital management is concerned with the management of current assets and current liabilities and the interrelationship that exists between them. Current assets are those circulating assests on organization which are either in cash or are, in the normal course of business, required to be converted into cash as early as possible and probably within one year. The example of current assests are Bills Receivables,

Inventory, Debtors, Marketable securities etc. Current liabilities are those liabilities which are due for payment within one year. Bills payable, Creditors, Bank overdraft etc. are the examples of current assets and current liabilities in such a way so as to ensure the achievement of optimum level of working capital. Management of working capital involve a trade off between profitability and liquidity risk. If a firm maintains high level of working capital it will enjoy good liquidity position and there will be no risk (Liquidity) of non meeting of current liabilities on the due dates, but maintenance of excess liquidity will adversely effect the profitability position of the company. The excess amount invested in current assets will not earn return for the company and the same could have been invested by the company in some other profitable investment avenues and that would have added some profits to the company exchequers. On the other hand, it a company is not maintaining adequate level of current assets and has invested its resources in long term investment avenues it may not be able to meet its liabilities as and when they become due for payment. Thus management of working capital involves striking a balance between short term solvency (liquidity) position of the firm and its profitability. How management of working capital involves a trade off between liquidity and profitability is explained with the help of a simple example below:

Suppose you have Rs. 100000 with you and on the other hand you have liabilities which will become due for payment within the next few days. An opportunity to invest Rs. 100000 at a rate of interest 5% comes you way. If you invest the money then

Advantage

Your profits/income will go up by

100000 x 5/100 = Rs. 5000 per month

Disadvantage

A Liability becomes due during this period, since you do not have cash with you, it will not be possible for you to meet your liabilities and hence there will be blow to the image of your business due to poor liquidity position. This blow to image can be very dangerous for the business.

Similarly we can explain about the other components of working capital e.g. If we consider the case of maintaining high level of inventory with you, positive aspect is, it will ensure that production process will continue unhindered in case of a manufacturing concern and all sales orders will be met in case of a trading organization, but on the other hand excessive investment in inventory means blockage of funds, which could have been invested somewhere else and profitability improved. Similarly other effects of holding excess inventory can be losses due to inventory going out of date, since inventory levels are high there can naturally be more wastage, chances of pilferage and further inventory management cost will also go up.So finance manager has to ensure that the business has optimum level of working capital.

3.1.1 Aim of Working Capital Management

1. The foremost aim of working capital management is to manage the firm's current assets and current liabilities to achieve satisfactory level of working capital and enable the firm to meet its short-term obligations as and when they arise.
2. To ensure that profitability of the organisation is not affected by the way, the working capital of the organisation is managed.
3. The optimum level designed for the working capital must have provision for contingencies.
4. Trade-off between Profitability and Risk: The level of a firm's net working capital has a bearing on its profitability as well as risk. The term profitability used in this context is measured by profits after expenses. The term risk is defined as the probability that a firm may become technically insolvent may not be able to meet its liabilities when they become due for payment. The risk of becoming

technically insolvent is measured using Net Working Capital. The more the net working capital, the more liquid the firm is. The relationship between net working capital and risk is inverse.

5. Capital Structure: One more important ingredient of the theory of working capital management is determining the Capital structure/financing mix. Financing mix refers to the proportion of current assets that would be financed by current liabilities and by long-term resources. As a prudent measure current working capital should be financed out of short term sources of finance and permanent working capital should be finance out of long term sources of finance.

3.2 Concept of Working Capital

There are two main concepts of working capital i.e. Gross Working Capital and Net Working Capital. **Gross Working Capital** is the aggregate value of the total current assets. **Net Working Capital** is the difference between current assets and current liabilities. In other words we can say that net working capital is that portion of working capital which is financed by long term sources of finance.

Example: Following is the balance sheet of XYZ Ltd as on 31-03-2010, the gross working capital and net working capital in this example is:

Balance Sheet of XYZ Ltd.

As on 31.3.2010

Liabilities	Rs.	Assets	Rs.
Share Capital	500000	Fixed Assets	650000
Long Term Debt	200000	Current Assets	450000
Current Liabilities	400000		
Total	1100000	Total	1100000

Gross working Capital = Aggregate value of current Assets = Rs. 450000

Net working Capital = Current Liabilities = Rs. 4500000 – Rs. 400000 = Rs 50000

Accountants normally refer to net working capital whenever they talk about working capital, as net working capital is the difference between current assets and current liabilities and is the extent to which firm is protected against liquidity crunch. On the other hand, financial analysts refer to gross working capital whenever they talk about working capital as they are concerned with providing correct amount of current assets to the firm at all level.

3.3 Need of Working Capital

Working capital is referred to as the life blood in any organization, as its role is inevitable in keeping the organization running. Working capital is the aggregate of money invested in inventory. Debtors and cash mainly. Investment in inventory is required to keep the organization running. In cash of manufacturing organizations, normally three types of inventory is involved i.e. Raw Material. Work – in- Progress and Finished Goods. Sufficient quantity of raw material is required to keep the production process running, if sufficient level of raw material is not maintained it may lead to the stoppage of production process, similary inventory of finished goods is required to be maintenance to meet the demand of consumer of goods. Trading firms need to investment in finished goods only. Another important component of working capital is the debtors, persons to whom goods have been sold have been sold on credit. A lot of money of the firms in invested in this asset only, in an era of stiff competition firms have to, in order to maintain and increase their market share, sell goods on credit. Cash is maintained by the organizations to meet seen and unforeseen liabilities as and when they become due for payment. Further, the objective to maximization of

the wealth of the shareholders cannot be met without increasing the magnitude of sales and sales do not generate cash immediately. The time lag (technically called as operating cycle) between investment in purchase of stock for sales and realization of cash from its sale lead to the requirement of working capital whether firm will be in need of more working capital or less working capital that depends upon a number of other factors, these factors have been discussed in detail later in this chapter.

3.4 Types of Working Capital

The types of working capital are as follows:

A. On the Basis of concept

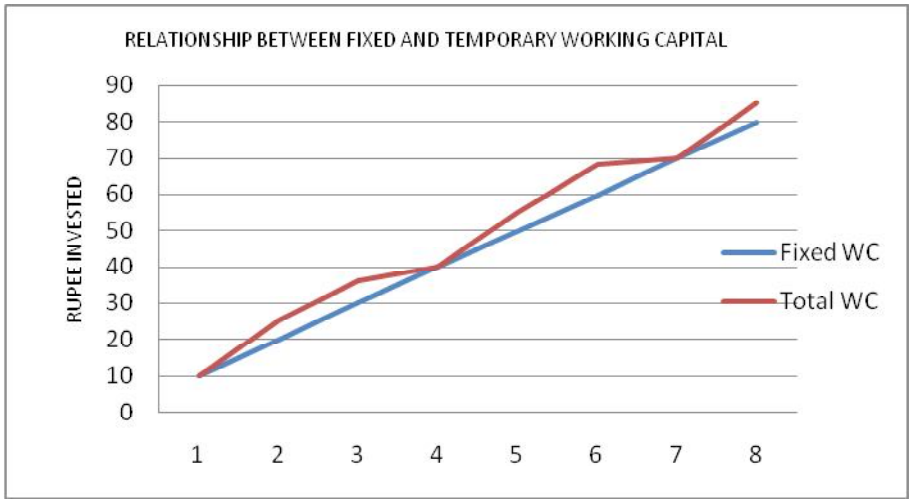
1. Gross Working Capital is the aggregate value of the total assets.
2. Net Working Capital is the difference between current assets and current liabilities. In other words we can say that net working capital is that portion of working capital which is financed by long term sources of finance.

B. On the Basis Periodicity

1. **Permanent Working Capital :** It is also known as fixed working capital. The other names of this portion of working capital is the reserve and cushion working capital. This amount is that portion of working capital which is struck in the business on a fixed basis e.g. minimum amount of all current assets that is required at all times to ensure a minimum level of uninterrupted business operations. Some minimum amount of raw materials, work in progress, bank balance, finished goods etc. a business has to carry all the time irrespective of the level of manufacturing or marketing operations. If you scan the debtors account, you will find that the investment in debtors has never fallen below some particular level. So the minimum level of investment below which balance has never fallen in case of these assets is the permanent portion of working capital. Permanent working capital I similar to the firm's fixed assists because the money is invested on a long term basis and in case of companies in growth stage, investment un fixed poetion of working capital keeps on increasing as it is in the case with fixed assets. So, permanent working capital is perennially needed one though not fixed in volume. This part of the working capital being a permanent investment needs to be financed through long-term funds.
2. **Temporary Working Capital :** Temporary working capital is that portion of capital which keeps on varying. The investment in this portion of working capital is highly related to the seasonal requirements and production schedule of the organization. During seasons, more production/sales take place resulting in larger working capital needs. The reverse is true during off-seasons. As seasons vary, requirement of temporary working capital keeps on moving up and down. Temporary working capital can be financed through short term funds like current liabilities. When the level of temporary working capital moves up, the business might use short-term funds and when the level for temporary working capital recedes, the business may retire its short-term loans.

Both types of working capital are must to facilitate the sales and production process.

Figure below shows the relationship between fixed and temporary working capital. Red line shows the total working capital requirements and blue line shows the fixed working capital. The difference between red and blue line is the Fluctuating/Temporary working capital.



3.5 Measurement of Working Capital

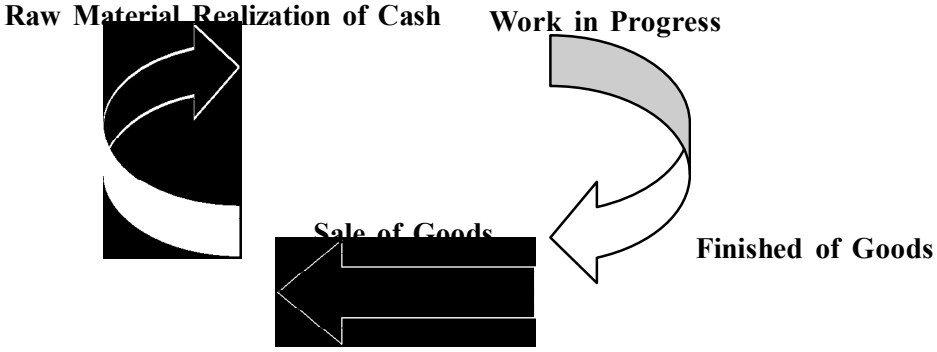
There are following three methods for estimation of working capital and any one method can be employed to estimate the working capital requirements of a business :

1. Operating Cycle Method
2. Percentage of Sales Method, and

Components of Working Capital Method

I. **Operating Cycle Method :** Under this method operating cycle is used for the purpose of calculation of working capita: One of the main reasons behind need for working capital is the operating cycle. Longer the operating cycle, higher is the requirement of working capital and vice-versa. Working Capital is also known as the revolving capital and one complete revolution of cycle is called as the operating cycle e.g. a person starts a business with an initial investment and starts his production process. He may have inventory struck at various levels in his production process i.e. Raw Material, Work-in-progress and Finished Goods. Raw material is required to carry on the production process, work-in- progress is the inventory which is passing through the production process, in most of the manufacturing concerns you will find some inventory always moving in the production process and then finished goods are ready for sale but until these goods are sold, they remain in stock. Sales may be for cash and/or credit basis. The business person may have to wait a little to realize cash from customers. The realized cash is used to pay creditors. But he needs to maintain cash balance to pay for seen and unforeseen day-to-day operations. Thus a circle from cash to raw materials to Work-in-Progress, to finished goods, to debtors, and back to cash takes place. This cycle is called as operating cycle. Therefore, we can say that the term operating cycle refers to the sum of length of time involved mainly in the following three stages:

- Conversion of cash into inventory
- Conversion of inventory into debtors
- Conversion of debtors into cash



Stage 1:

Purchase of Inventory – In this stage, cash is spent to purchase the raw material thus cash first gets converted into raw materials, then raw material is put into process and it takes the form of work-in-progress and finally after completion of production process we get finished goods in a typical manufacturing concern. All this process from purchase of raw material and its conversion into finished goods requires time. In case of trading firms, when the goods are purchased, cash gets converted into inventory.

Stage 2 :

Inventory to Debtors – The inventory thus produced or purchased is put for sale to customers. The time involved in selling the finished goods further enhances the length of operating cycle. In case goods are sold on cash basis then operating cycle will get complete but in case sale is on credit basis then your sales get converted into debtors or receivables and further enhance the length of operating cycle.

Stage 3:

Realisation of Cash – In case of cash sales, with the realisation of cash from sales, operating cycle stands complete. But in case of credit sales operating cycle gets complete on receipt of cash from debtors.

Length of operating cycle: Lengthier the operating cycle, higher will the working capital requirements and vice-versa.

Process of estimation of working capital on the basis of operating cycle method

Step 1			**No. of Days**
RMCP*	= **Average stock of Raw Material** / **Raw material consumed per day**	=	
+ WIPCA*	= **Average Stock of Work in progress** / **Cost of production per day**	=	
+ FGCP *	= **Average Stock of Finished Goods** / **Cost of goods sold per day** / **Inventory Conversion period**	=	
+DCP*	= **Book Debts** / **Average Credit Sales per day**	=	
-CPAS *	= **Creditors** / **Credit Purchases per day**	=	
	Operating Cycle	=	

Step II:

Calculate number of operating cycles in a year

In order to calculate the number of operating cycles in a year, we can use the following formula

$$\text{Number of operating cycles} = \frac{\text{Number of days in a year (365)}}{\text{Length of operating cycle in days}}$$

Step III

Amount of Working Capital Required = Cost of Sales

No. of Operating cycles in a year

* RMCP Stands for Raw Material Conversion Period, WIPCP Stands for work- in- progress conversion period, FGCP stands for Finished Goods conversion period, DCP stands for debtors conversion period and CPAS stands for credit period allowed by suppliers.

Example:

Computation of length of operating cycle:

Average credit period allowed by creditors	40 days
Average total of debtors outstanding	Rs400,000
Total consumption of raw materials per annum	Rs4,400,000
Total production cost per annum	Rs12,000,000
Total cost of sales	Rs11,100,000
Sales during the year	Rs16,000,000
Value of stock maintained:	
Raw materials	Rs400,000
Work in progress	Rs450,000
Finished goods stock	Rs300,000

Calculate the operating cycle.

Solution:

1.RMCP2.WIPCP	= Rs400,000 x 365 =	Rs4,400,000		33 days
3.FGCP	= Rs450,000 x 365 =	Rs12,000,000		14 days
4.DCP	= Rs400,000 x 365 =	Rs16,000,000		10 days
5.CPAS	= Rs400,000 x 365 =	Rs16,000,000		9days 66 days
Less: Age of creditors (given)				40 days

Operating Cycle 26 days

StepII

Number of Operating Cycles in a Year = 365/26 14 days

Step III

If the cost of sales is Rs 500000 then,

Working Capital Required = 500000/14 Rs. 35714

II Percentage of Sales Method

Quantity of production is determined on the basis of sales and quantity of production further determines the size of working capital. Under this method a relationship of sales is established with the working capital and that relationship becomes the basis for calculating the working capital requirements.

Example : In case of Rajindra Traders, Working capital is 20% of the sales. Now if we are given sales of the next year let us say Rs. 20 lacs. Then working capital required is 20% of Rs. 20 Lacs i.e. Rs. 400000.

III Components of Working Capital Method

Under this method each component of working capital i.e Stock, Debtors, Creditors etc. is separately estimated and requirement of working capital in aggregate determined.

Example : M/s. Raj Traders is in the business of manufacturing and sale of furniture. They have asked you to estimate the amount of working capital which will be required in the first year's working. You are given the following estimates and are required to add 20% to your computed figure to allow for contingencies.

			Figures for the Year (Rs.)
1)	Average amount invested in stocks		
	Stock of Finished Goods		5000
	Stock of Raw Material		12000
2)	Average Credit Period allowed		
	Domestic Sales 12 weeks Credit		156000
	Export	3 weeks credit	39000
3)	Lag in payment of expenses		
	Wages	3 weeks	130000
	Stocks, Materials	3 months	96000
	Rent, Royalities 6 months		20000
4)	Advance payments		
	Miscellaneous Expenses (Paid quarterly in advance)		8000

Solution: Estimation of Working Capital

1.	**Current Assets**		**Amount(Rs)**
	A)Stock of Finished Goods		5000
	B)Stock of Raw Material		12000
	C)Debtors		
	Domestic Sales (156000x12)/52		36000
	Export (39000x3)/52		2250
	D)Advance payment	(8000x1)/4	2000
Total Investment in Current Assets			**57250**
2.	**Current Liabilities**		
	A) Wages	(130000x3)/52	7500
	B) Stocks, Materials	(96000x3)/12	6000
	C) Rent, Royalties	(20000x6)12	10000
Total Current Liabilities			**23500**
Net Working Capital Required:			
1.	Current Assets (57250) – Current Liabilities (23500)		33750
2.	Add 10% Contingency		3375
Average Amount of working capital required			**37125**

3.6 Determinants of Working Capital

Following are the determinanants of working capital

1. **Nature of Business :** Nature of business is one of the major determinants effecting the working capital requirements in a business. On the basis of nature of business, organizations can be classified

into three categories viz. Public Utility Services, Trading and Manufacturing concerns. Organizations involved in providing public utility services can carry on their business activities with very small amount of working capital because of two factors i.e. firstly, they in most of the cases deal in cash and secondly, since they render services and not required to maintain any inventory. On the other hand in the case trading companies, working capital requirements is more as compared to public utility companies as these companies are required to maintain inventory of finished goods to ensure smooth flow of business and because of stiff competition many of these companies are selling goods on credit and this sale of goods on credit further enhances working capital requirements in these companies. In case of organizations involved in manufacturing business, requirement of working capital further increases as these organizations along with other requirements of working capital are required to further invest money in raw materials and work in progress inventory.

2. **Operating Cycle :** Operating cycle is the time period involved from the point we invest our cash in purchase of inventory till we receive cash from the sale of inventory. This operating cycle is again one of the major determinants of working capital requirements. Larger the operating cycle more will be the time for which funds will remain locked in the process and more will be the required working capital and vice-versa. There are some enterprises which because of the nature of their business have small operating cycle and therefore need less amount to meet their working capital requirements e.g. petrol stations because of the nature of their product are able to sell their products at short intervals and have a very high inventory turnover and consequently the investment in the inventory will be less. In case of distilleries because of the ageing process involved, huge investment will be required in the inventory. In case of firms falling in the same industry, technology employed can effect the operating cycle and hence working capital requirements within the same group of industries can be different.

3. **Credit Policy :** Credit Policy of the organization is again one of the most important factors substantially effecting the working capital requirements of the organization. Credit policy influences the requirements of the working capital from two different angles i.e. through credit terms granted by the firm to its customers and secondly the terms at which credit are available to it from the suppliers.

   Credit terms on which goods are sold effects the book debts of the firm and hence the working capital requirements. More liberal the credit terms higher will be the sale of goods on credit and therefore higher will the blocking of the amount in book debts and working capital. In case the credit terms for credit sale are strict, less will be the involvement of money in book debts and hence working capital. Credit terms are dependent upon a number of factors and one of the important factors among the factors effecting the credit terms is the degree of competition prevailing in the market, in case firm is enjoying monopoly because of the quality or distinction of the product, it can have strict credit terms. If there is a stiff competition in the market firm will have, in order to not only to retain its existing market position but also to develop it further, to have lenient credit policy.

   Besides credit policy at which goods are sold by the firm to its customers, credit policy at which goods are purchased by the firm from its suppliers also effects its working capital requirements. If credit is available at easy terms then it will lower the working capital requirement of the business and vice versa.

4. **Production Policy :** The amount blocked in working capital is also affected by the production policy being followed. In case the demand of the product is seasonal then the firm can choose any one of the two options available with it. The first option can be to keep the production process going and accumulate the inventory during off season to meet the demand of the peak season. In this case amount of money blocked in working capital will keep on increasing and the period for

which working capital will remain blocked will also be more. The second option is to stop the production process during off season and to do production at a very high speed during the peak season to meet the demand.

5. **Growth and Expansion Opportunities:** In case of companies in growth mode, requirements of the working capital keep on increasing with increase in scale of operations. The type of relationship between the growth of a company and the increased requirements in working capital is difficult to predict. Other things remaining same, growth companies require more capital than those that are static.

6. **Availability of Raw Material:** Continuously supply of raw material is the most critical factor for the smooth running and growth of business organization. In case the raw material being used is easily available, firm need not block its funds in the inventory and it can purchase the inventory as and when required. In case the raw material is of a special nature and available in a particular season, firm will have to buy large quantity of it and large amount of money will stand blocked in this asset and more will the requirement of working capital. Further in case availability of raw material in the market is not certain and keeps on fluctuating within very short spans, firms will have to buy large quantities of inventory to tide over this uncertainty.

7. **Market Conditions :** In case firm is enjoying monopolistic conditions in the market, working capital requirements will be less as firm can afford to have stringent credit policy. Further, it will not be required to introduce a number of different kinds of products to maintain market position and hence investment of money in the inventory will be less. On the other hand if there is stiff competition in the market, firm will have to introduce a vide variety of products and also will have to offer credit sales on liberal terms to maintain market position and achieve growth. Hence, in markets oriented with stiff competition, large amount of working capital will have to be maintained by the organizations.

8. **State of Economy :** Economic conditions do effect the working capital requirements of the business organization. If the economy is booming, then sales of the firm will be increasing, to meet the ever increasing sales firm will maintain high level of inventory and in case firm is selling goods on credit in the booming market more and more money will get struck in debtors. Hence in the booming economy, firms will be required to have more working capital as compared to stagnant and recessionary economies.

9. **Nature of Product :** In case of fast moving products like petroleum, firms can do with fewer inventories. In case of slow moving products like jewelry, funds remain locked for long period of time and therefore increase the requirements of working capital. In case products are of perishable nature, firms will be maintaining less inventory so as to avoid losses on account of high chances of inventory getting perished. In case of consumer durable products, firms may take the chance of maintaining large inventory base.

10. **Dividend Policy :** Appropriation of dividend out of profits is another factor which effects the working capital requirements. Payment of dividend in cash reduces the working capital, whereas retention of profits and non payment of dividend increases the working capital. There are wide variations in the industry as regards the payment of dividend. In some of the cases, companies in spite of highly profitable has skipped payment of dividend on excuse of non availability of cash while in some other cases payment of dividend has been ensured on regular basis in spite of poor profitability but sound liquidity. In some cases, expectations of the shareholders regarding payment of dividend has been met by the corporate through the issuance of bonus shares thus paying dividend without effecting the level of cash and hence the working capital.

11. **Operating Efficiency :** Operating efficiency also effects the working capital requirements of the firm. By ensuring efficient utilization of resources and by eliminating waste, improving coordination

and a fuller utilization of existing resources etc. one can accelerates the pace of cash cycle and improve the working capital turnover. It releases the pressure on working capital by improving profitability and improving the internal generation of funds.

12. **Price Level Changes:** Rise in prices means more funds will be required to carry on the business at the same level. More funds will be blocked up in inventory and other current assets. The effect of rising prices will be that a higher amount of working capital will be required. Some of the companies may have the ability to increase the price of their product in their case the problem of price will not severely effect the working capital position. The effect of price rise varies from company to company.

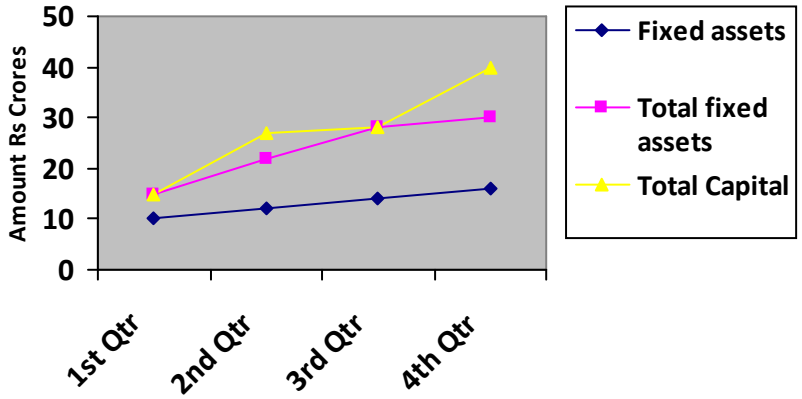
13. **Level of Automation:** Level of automation in an industry further effects the working capital requirement of a business organization. Higher the level of automation, lesser will be the working capital required and vice-versa.

14. **Statutory Requirements :** In some of the organizations there may be some statutory requirements regarding the minimum amount of working capital or of some specific component of working capital to be employed in a business. Like in Banks as per RBI guidelines banks are required to ensure compliance with Cash Reserve Ratio and Statutory Liquidity Reserve Ratio. These types of statutory norms are bound to have a substantial effect on the level of working capital.

3.7 Financing and Control of Working Capital

On the basis of periodicity, working capital can be divided into two categories i.e. Permanent Working Capital and Temporary Working Capital. As per the rational policy decisions, permanent portion of working capital should be financed by using long term sources of finance and variable portion of working capital can be financed by using short term sources of finance. However, there are three approaches which are being followed to finance the working capital requirements. These approaches are:

1 **Hedging(Maturity) Approach :** In this approach, a firm adopts a hedging (maturity) approach to finance its working capital requirements, each asset is financed with the financing instrument of the same approximate maturity. Seasonal or short term component of working capital would be financed by short term sources of finance and long term sources of funds would be used to finance permanent portion of working capital and fixed capital. The rationale behind this approach is that if long term funds are used to finance the variable part of the working capital then firm will have to pay interest for these funds during those periods also when these funds are not required during off seasons. According to this approach funds will be arranged and refunded depending upon movement of funds less spontaneous financing.



2 **Conservative Approach :** This approach is more concerned about the liquidity risk than about the profitability. Entire funding requirements are required to be met, irrespective of the period of requirement, from the long term sources of finance. This approach will help in reducing the liquidity risk but will adversely affect the cost of capital and hence the profitability of the organization. Long term sources are more costly as compared to the short term sources and secondly during off periods when the requirements for temporary working capital will go down funds raised from long term sources will be idle and carrying cost thus will increase the cost of capital and hence reduce the profits of the firm.

3 **Aggressive Approach :** This approach of financing working capital requirements is entirely opposite to the conservative approach. Firms are concerned more with profitability than about the solvency position. According to this approach, even a part of the funds required for long term should be met from short term sources of funds. Short term sources of funds are less costly as compared to long term sources of funds and if employed in large proportion will, help the firm in bringing down the overall cost of funds. But if short term source of funds are used to meet long term financial needs, funds will not be available to pay when these short term sources become due for payment as funds have been invested for a long term period. Firm in this case will be facing liquidity risk.

3.7.1 Maximum Permissible Bank Finance

Bank financing of working capital of the business enterprises has been a subject of great concern and discussion over the last few years. Reserve Bank of India has appointed a of committees like number, Dehejia, Tandon, Chore, Marathe, Chakravarty, Kannan and Chore, of committees to look into the issue of fixation of maximum limit on bank financing of working capital of the business enterprises. Recommendations of few of these committees are as follows**:**

Dehejia Committee

Committee recommended that total requirement of a firm should be segregated into two parts i.e. Hard Core and Short term Component. The hard core component represents the minimum level of inventory which the industry was required to hold for maintaining a given level of production and it should be financed by banks on term loan basis and should be subject to repayment schedule. Dealings of a customer should remain confined to one bank only. This committee further recommended that extension of credit should not be security based but should be decided on the basis of operations of the borrower.

Tandon Committee

This committee was appointed by RBI in the year 1974 to suggest guidelines for commercial banks to follow up and supervise credit from the point of view of ensuring proper end use of funds, to suggest data banks must obtain form borrowers and RBI from the leading banks, to suggest criteria regarding satisfactory capital structure and give recommendations regarding the suitability of bank credit schemes like cash credit limits, overdraft etc. in meeting the industry short term credit needs etc.

Committee along with a number of recommendations also gave recommendation regarding lending norms. It has suggested three alternatives for lending purposes. According to first method, the borrower will have to contribute a minimum of 25% of the working capital gap from long term funds. These own funds may take the shape of own funds and term borrowing. In this way, firm will be able to achieve a minimum ratio of 1.17:1. In case of second alternative, committee has suggested that a minimum of 25% of the total current assets must be financed from long term funds and give a minimum current ratio of 1.33: 1. In the third 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 current assets.

Chore Committee

Reserve Bank of India in March, 1979 appointed a committee under the chairmanship of Shri. K.

B. Chore to review the working of cash credit facility being granted to the firms for meeting their working capital requirements. The recommendations of the committee were i) The bank should obtain the quarterly statements in the prescribed format from all the borrowers having cash credit limit of Rs. 50 Lacs and above. ii) Periodical review of the limits of Rs. 10 lacs and above should be taken. iii) Cash credit accounts should be divided into demand loan and cash credit components iv) Banks should discourage sanction of temporary limits by charging additional one percent interest over the normal rate of these limits.

Marathe Committee

It was appointed in the year 1982 under the chairmanship of Marathe. The task of the committee was to review the working of Credit Authorisation Scheme(CAS) and suggest measures for giving meaningful directions to the credit management function of the Central Bank. The major recommendations of the committee include :

1. The committee has declared that the Third method of lending as suggested by the Tandon Committee be scrapped and desired that the banks should provide credit in future according to second method of lending.
2. To speed up the loan sanctioning and disbursement process, committee recommended that a Fast Track Schemen should be adopted. It recommended that 50% (75% in case of export oriented units) of the additional credit required by the borrowers be released by the banks without prior approval of RBI where the unit meets the following requirements :

   i) The classification of assets and liabilities as current and non-current is in conformity with the guidelines issued by the Reserve Bank of India.

   ii) The projected Current Ratio is 1.33:1

   iii) Projections regarding various factors used in estimation of funds requirement is justified in terms of the past trend.

   iv) The borrower should have been submitting his operating statements for the past six months within the prescribed time and undertake to do the same in future also.

   v) Borrower should submit his annual accounts regularly and promptly and bank should review the credit facility on annual basis.

Chakravarty Committee

Sukhamoy Chakravarty Committee was appointed by RBI to review the working of monetary system in India. Committee in its report given in the year 1985 suggested two major recommendations with regard to working capital finance:

i) Penal Interest for Delayed Payment

Committee advised that Government must insist that all large private sector firms, government departments and public sector units should include penal interest clause in their contracts for payment delayed beyond a specified period. The penal interest may be fixed at 2% higher than the minimum lending rate of the supplier's bank.

ii) Classification of Credit Limit

Committee further suggested that the credit limit sanctioned for the borrower be classified under three different heads as given below

1) Cash Credit I – Include supplies to the Government

2) Cash Credit II – Include Limits granted under special circumstances

3) Normal Working Capital Limit : Include the balance credit facilities

Committee proposed that different rates of interest should be charged for different categories of cash credit limit.

Kanan Committee

This committee was appointed by Indian Bank Association under the chairmanship of Shri. K. Kannan. The task of the committee was to examine all the aspects of working capital finance and also suggest regarding the maximum permissible bank finance for meeting the working capital requirement of a firm. Committee suggested that bank should be given freedom to evolve their own system of extending working capital finance as it will help them in quick disposal of the cases. This committee also desired a change in the focus from liquidity level lending(Security Based Lending) to the Cash Deficit Lending(Desirable Bank Finance). Some of the important recommendations of the committee as adopted by RBI are as detailed below :

i) Banks given to evolve their own system of assessing working capital requirements of the borrower within the ambit of overall guidelines and norms already prescribed by RBI.

ii) Turnover method may continue to be used as a tool to assess the requirements of small borrowers. For small scale and tiny industries this method has been extended upto total credit limits of Rs. 2 crore as against the existing credit limit of Rs. 1 crore.

iii) Banks may use Cash Budgeting System for assessing the working capital finance in respect of large borrowers.

iv) The banks have also been allowed to retain the present method of MPBF with necessary modifications or any other system as they deem fit.

v) Banks should lay down transparent policy and guidelines for credit dispensation in respect of each broad category of economic activity.

Nayak Committee

Nayak committee is the another important Committee appointed by RBI to look into the problem of working capital finance besides other related issues. Nayak committee suggested that the working capital requirements of a firm should be calculated on the basis of sales of the firm. He advised that on an average 25% of the sales is required to be invested in working capital. Regarding financing of this 25% , committee advised that 5% should be borrower's margin and rest of the working capital should be financed by the bank.

3.7.2 Sources of Finance

There are many sources for financing both permanent and temporary forms of working capital. Finance for meeting the working capital requirements can be arranged both from internal as well as external source of finance. The external sources are both short-term and long-term. Retained earnings are an example of internal source of funds. Trade credit, loans/limit and overdrafts from commercial banks, finance companies, indigenous bankers, public deposits, advances from customers, accrual accounts, loans and advances from directors and group companies etc., are external short-term sources. Companies can also issue debentures and invite public deposits for working capital which are external long-term sources. Equity share can also be issued to finance permanent working capital.

1 **Commercial Paper:** Commercial paper is a short-term unsecured obligation with a maturity ranging from 2 days to 1 year. These are issued by companies to investors with temporarily idle cash. It can be issued only if the company possesses an excellent credit reting. Though commercial papers has been in existence in the US for more than 100 years, it made its appearance in other

countries only after 1980s. Commercial Papers were introduced first time in India in January 1990. After their introduction, a lot has changed about the commercial papers. Interest rate in case of commercial papers is less than that of a bank-loan. Commercial paper is usually sold at a discount with the interest immediately deducted from the face of the note by the creditor and the company pays the full face value upon maturity. Commercial paper can also be issued in interest-carrying form. It may be issued through a dealer or directly placed to an institutional investor.

The benefits of commercial paper are that no security is required, the interest rate is typically less than required by banks or finance companies, and the commercial paper dealer often offers financial advice. Commercial paper can be issued only by large, financially sound companies having a minimum networth of Rs. 4 crore.

Joint stock companies, Corporations, banks and insurance companies and term lending institutions can invest money in commercial papers.

2 **Trade credit and terms :** Trade credit is a short-term credit facility extended by the suppliers of raw materials in the normal course of business. It is a widely used and the most important source of financing. Trade credit can take any one of the two forms i.e. open account credit or acceptance. In the case of open account credit, credit is extended to the buyer, without requiring the buyer to sign any debt instrument as such. The invoice is the basic document. In the acceptance credit system, a bill of exchange is drawn on the buyer who accepts and returns the same. The bill of exchange evidences the debt. Trade credit is an informal and readily available credit facility. It is unsecured form of credit.

But trade credit may be costlier as the supplier may inflate the price to account for the loss of interest for delayed payments, though there is no explicit interest charge. If the company has liquidity difficulties, it may be able to stretch accounts payable; however the company will be required to give up any cash discount offered and accepted at a lower credit rating. The cost of trade credit is generally very high beyond the discount period, firms should avail of the discount on prompt payment. If, however, they are unable to avail of the discount, the payment of trade credit should be delayed till the last due date.

3 **Bank Credit** : Bank credit is one of the most important sources for financing of current assets. There are large number of different types of facilities under which credit can be availed from the bank, different forms of bank credit may include letter of credit, straight loans, cash credit limits, overdrafts, bills discounting, short-term loans, hypothecation loans, pledge loans, mortgage loans etc. Even though other Non Banking Finance institutions such as savings and loan associations and credit unions provide banking services, most banking activities are conducted by commercial banks. They allow the company to operate with minimal cash and still be confident of planning activities even in uncertain conditions. Credit can be availed from the banks to meet both types of working capital requirements i.e. Fixed and Temporary working capital. One of the major and most important source of working capital form banks is Cash Credit limit, it is a short term credit facility extended by a bank. Limit is sanctioned by a bank to its reputed customers for a period of one year with the option of renewal every year. The maximum finance available under this facility is determined by the bank in accordance with the guidelines issued by RBI in this regard. Besides the credit limit, drawing power is also determined by the banks on the basis of the current level of inventory lying with the borrower. Borrower is required to ensure that his withdrawals are within the drawing power determined by the bank and in case drawing power is revised downwards by the bank and amount already withdrawn is more than the fresh drawing limit determined by the bank then within some stipulated time borrower has to return the amount to the bank and ensure it that the amount withdrawn is within the drawing limit affixed.

4 **Factoring** : Factoring is an agreement between the seller of goods and services and the financial

institution (factor) whereby later purchases the receivables portfolio of the former and also help the former in the collection and management of sales ledger of receivables of the former. Large numbers of banks are providing factoring services in India. Main services provided by the factors are:

1. Financing of trade debts

2. Maintenance and administration of sales ledger

3. Collection of accounts receivables

4. Assumption of credit risk

5. Render Advisory services.

Factor charges a price which is normally 2 to 4% more than the prime lending rate for providing all these services.

5 **Finance Companies:** Finance companies provide similar credit and loan facilities like banks, though they are not banks. They provide need based loans and sometimes arrange loans from others for customers. Interest rates are usually higher than banks. But timely assistance may be obtained.

6 **Public deposits:** They are unsecured deposits raised by businesses for periods normally exceeding a year. These are another good source of finance for the working capital requirements.

7 **Other sources of financing:** Advance from customers, accrual accounts like outstanding expense, loans from directors etc., are some of the other sources of financing working capital requirements.

3.8 Issues in Working Capital Management

Management of working capital is one of the very critical tasks to be performed by the finance manager. While managing working capital, finance manager is required to look into the following issues i.e. How much is the requirement of working capital, how it is to be assessed, from where to raise the money to meet the working capital requirements and the most important one is to strike a balance between Liquidity and profitability.

3.9 Summary

The Financial requirements of the company, on the basis of time, can be classified into two main categories i.e. Fixed Capital and Working Capital. Fixed capital is the long term capital of the company whereas working capital involves short term funds requirements. Working capital is the capital employed by the organization to meet its short term funds requirement. Management of working capital is a very critical and important task in the hands of finance manager. Working Capital is also known as the circulating capital and its role can be compared with the role being played by blood in the human body. However, depending upon the nature of business, importance of working capital can be comparatively less or more.

Working Capital management is concerned with the management of current assets and current liabilities and the interrelationship that exists between them. The objective of working capital management is the management of current assets and current liabilities in such a way so as to ensure the achievement of optimum level of working capital. Management of working capital involves a trade off between profitability and liquidity risk. There are a number of factors which effect the working capital requirements of a business e.g. In case of manufacturing concerns more working capital is required as compared to public utility concerns, similarly level of automation, production policy, dividend policy, growth rate of the industry, nature of product etc. are the other factors which have a strong bearing on the level of working capital required in a business. One of the major factors effecting the working capital requirements in a business is the operating cycle. Operating cycle is the time gap between investment of cash in the business through

purchase of raw material till the realization of this cash from the sale of finished goods. There is a direct relationship between the operating cycle and working capital requirements.

So far as the assessment of working capital is concerned, there are basically three methods i.e. Components of working capital method in which working capital requirement is estimated on the basis of its components i.e. current assets and current liabilities. Second is percentage of sales method. According to percentage of sales method working capital is some fixed percentage of sales. Past trend of working capital as a percentage of sales is calculated and on the basis of this trend, estimates are made for the working capital required in the future. Third and the most widely used method for assessing working capital requirements is the Operating Cycle Method. Under this method cost of sales is divided by number of operating cycles in a year to find out the working capital requirements.

Number of sources and approaches are being employed by the firms to meet their working capital requirements. Short term sources are less costly as compared to long term sources of finance. As a prudent measure, temporary part of working capital should be financed out of short term sources of finance like Bank Credit, trade credit, commercial papers and factoring and permanent part of the working capital should be financed from long term sources of funds only.

3.10 Key Words

- **Current Assets:** Cash or such near cash assets which can be easily converted into cash probably within a period of one year.
- **Current Liabilities:** Those liabilities which are due for payment within one year
- **Working Capital**: Funds involved in current assets and current liabilities for short term
- **Liquidity Position**: Ability of the Firm to pay its short term obligations as and when they arise.
- **Gross Working Capital**: Sum of money invested in current assets
- **Net working Capital**: Current Assets - Current Liabilities
- **Permanent Working Capital:** That portion of working capital which is invested in a business on permanent basis.

3.11 Self Assessment Test

1. What do you mean by working Capital? Explain the importance of working capital in a business organization.
2. Write a note on the types of Working Capital?
3. Write a note on the methods used for assessing the working capital requirements of a business enterprise.
4. Describe the factors effecting the working capital requirement of a business organization.
5. Explain in detail the recommendations of various committees constituted by RBI from time to time for streamlining the bank guidelines and procedures for extending the working capital requirement finance.

UNIT - 4 : MANAGEMENT OF CASH, RECEIVABLES AND INVENTORY

Unit Structure

4.0 Objectives

After reading this unit, you should be able to

- Describe the motives of holding cash and importance of cash
- Explain the factors which effect the cash requirements.
- Discuss the methods for estimating the cash requirements
- List out the various costs and advantage associated with holding inventory
- Highlight the various technique of inventory management
- Explain the critical areas in receivable management.

4.1 Introduction

Invenories constitute a major component in current arrests. For the smooth running every enterprise needs inventory. Invenories serve as a link between production and distribution process. Accounts receivables or debtors occupy a predominant place next to inventories in current arrests. Cash in needs at all times to keep the business going. A business concern should always keep sufficient profit for meeting its obligations any shortage of cash with hamper the operation of a concern and any excess of it will be unproductive.

4.2 Motives and Importance of Holding Cash

Cash is one of the most important components of working capital in an organization and is the most sensitive asset. Looking at the sensitivity and importance of this asset, most of the big firms maintain

separate records and process for exerting control over this asset. The important areas of concern in cash management are; Why do business organizations maintain cash with them? How much cash should be maintained by a business organization with it? These questions are very tricky and have to be very cautiously addressed by the finance manager . If he maintains high level of cash the positive about it is this that the liquidity position of the firm will be good and there will be no risk of making default in payments but the adverse effect of this will be on to the profits of the project and since cash is the most sensitive and fraud prone asset, there will be high chance of embezzlement. Therefore finance manager can neither keep very high level of cash with him nor does he afford to keep it at the minimum. He has to maintain optimum level of cash with himself and strike a balance between liquidity and profitability.

Why do business organizations keep cash?

Basically there are the following five purposes for which business organizations keep cash with themselves:

1. Transaction Motive
2. Precautionary Motive
3. Speculative Motive
4. Compensating Motive
5. Statutory Compliance

1. **Transaction Motive**: A business concern performs a number of transactions on daily basis i.e. Purchase of raw material, hiring of labour, repair and maintenance of premises and machinery etc and is required to make payment for the same in time. On the other hand firm keeps on receiving cash regularly and may be on daily basis from various sources like sales, income from investments etc. In case there is a match between payment and receipt schedule, firm is not required to maintain any cash with itself. But normally we find mismatch between payment and receipt schedule and in case of periods where there the amount involved in payments is more than receipts firm need to predict that in advance and ensure that it does not fail in meeting its obligations in time. In case a firm is not having sufficient cash with itself and fails to meet the payment schedule, firm will loose reputation in the market.

2. **Precautionary Motive**: In this case cash is kept by the firms to the obligations which may arise because of unforeseen contingencies e.g. some penalty is imposed under some court orders, sudden breakdown of the machinery, need for cash may arise because of floods, strikes and failure of an important customer to meet his obligations and there may be sharp increase in the cost of raw material etc. It is just like we people do in our routine life. As a prudent man we always keep some extra cash in our pockets just to ensure that we our able to meet any obligation which may arise due to unforeseen contingent event. Precautionary cash serves as a cushion to meet unexpected obligations. The more unpredictable a business model is the higher will be the cash requirement for precautionary purposes. In case firm has good market reputation and is able to borrow money at short intervals, it can carry on business operations with small amount of cash and vice versa.

3. **Speculative Motive**: Besides keeping cash to meet its routine daily needs and for precautionary purposes, firms and even individuals do maintain some extra cash with themselves to tap unforeseen business opportunities which may emerge suddenly. Speculative motive is different from

precautionary motive, while precautionary motive is defensive in nature and precautionary motive cash reserve is maintained to tide over unexpected contingencies, the speculative motive represents a positive and aggressive approach. The cash maintained for speculative motive may help in taking advantage of chances to speculate on interest rate movements by buying securities when interest rates are expected to decline, make purchases at favorable prices, take discount on purchases by making payments immediately etc.

4. **Compensation Motive**: In bank accounts we are always required to keep certain minimum balance of cash as per the requirements of the bank. This cash we keep to compensate the bank for services we take from it. On daily basis we take number of services from the bank like clearance of cheques, supply of credit information, transfer of funds etc. While for some of the services bank do take some extra charge but there are few services for which no charges are taken by the bank and the minimum balance requirement serves as a compensation for the bank for such services.

5. **Statutory Motive**: In some of the business concerns, some minimum cash is required to be maintained at all times as per the statutory requirements. This is applicable particularly in case of banking industry. As per the provisions of section 42(1) of the Reserve Bank Act, 1935 and as per the provisions of section 18 of the Banking Regulation Act, 1949 all the commercial banks are required to maintain some minimum amount of cash with itself, with its branches and in a current account with RBI as Cash Reserves. Reserve Bank can increase or decrease the CRR as per the requirements of the economy and government policy. Failure to meet the minimum cash reserve requirements can result in levying of civil and criminal penalties.

4.3 Objectives of Cash Management

Cash is one of the most important assets of a business organization. Finance manager finance has to always ensure that he has optimum balance of cash with himself. There are two basic objectives of cash management i.e. i) to meet the cash disbursement needs and ii) to minimize funds committed to cash balances. These two objectives are conflicting and mutually contradictory and the task of finance manager is to strike a trade off between these two.

1 **To Meet the Cash Disbursement Needs:** The basic objective of cash management is to meet the payment schedule, i.e. to have sufficient cash to meet the cash disbursement needs of a firm. The importance of sufficient cash to meet the payment schedule can hardly be over emphasized. If a firm has sufficient cash with itself, it can reap a number of benefits i) It prevents insolvency or bankruptcy arising out of the inability of a firm to meet its obligations ii) the relationship with the suppliers will be good iii) firm can negotiate for a better price of the product it deals in from its suppliers and more over firm can ask for a trade discount from its suppliers by making payment within the scheduled time.

2 **Minimize the funds blocked in Cash :** Keep funds idle for meeting the transaction motive or other purposes involves cost in the form of expenses on cash management and secondly in the form of opportunity cost as the funds kept in the form of cash do not earn any return and the same cash would have earned some income for the firm and added some profits to it had this cash been invested in some profitable investment opportunities.

The above stated two objectives of cash management are the basic objectives besides this there are number of other subsidiary objectives also like exploiting profitable investment opportunities and securing good credit ratings etc.

4.4 Factors Affecting the Cash Requirement

There are a large number of factors that determine the cash requirements of a business organization. The factors effecting cash requirements and their effect on cash management has been discussed in detail below:

1. **Matching of Cash Inflows and Outflows** : Everyday a firm receives cash from a number of sources like receipts from sale of goods, receipt from debtors etc and side by side it is required to make payment to various parties on daily basis like payment to suppliers, payment to labour, payment of bills of various natures etc. For all these receipts and payments firm is required to manage the cash. In case the payments and receipts they are matching then its very good for the business concerns and there will be no problem in management of cash and there will be no need to maintain cash balances. But in practice hardly receipts schedule match with the payment schedule. Sometimes there will be excess receipts while at some other times there will be payments will be on higher side. In other words there will be no synchronization between cash receipts and cash payments. The extent of non-synchronization determines the requirements of cash. Higher the degree of variance between cash receipts and payments, higher will be the requirement of cash and vice-versa. In order to predict the periods with excess cash and periods with shortage of cash, firms prepare cash budget in advance and do the necessary planning for cash management on the basis of this budget.

2. **Short Costs**: In case a firm is unable to meet its obligation as and when they become due for payment it has to bear some cost. Every shortage of cash-whether expected or unexpected involves a cost "depending upon the severity, duration and frequency of shortfall and how the shortfall is covered". Expenses incurred due to shortfall are called short costs. Following costs are included in the short costs:

   i) **Transaction Costs**: This is the cost which is incurred in raising the money to overcome the shortfall. In case some marketable security is sold to get the cash then cost may have to be incurred in the form of brokerage.

   ii) **Loss of Trade Discount**: The firm will have to forgo the trade discount which it could have earned by making payment within the credit period allowed by the suppler.

   iii) **Borrowings Cost**: To cover up the shortage, firm may have to borrow the money immediately from some other sources. In case firm goes in for borrowing to cover up the shortage, it will have to incur costs in the form of interest on loan, commitment charges and other expenses related to loan.

   iv) **Bank Penalty**: Firm may fail to keep the minimum balance required in the bank account and this may require bank people to impose penalty on the firm.

   Besides all this, credit rating of the firm may get adversely affected resulting into further losses to the firm because of low credit rate, may start asking for a higher rating people of interest, suppliers may also become cautious while supplying goods to the firm and may also start asking for cash payment etc.

3. **Cash Management Cost:** Management of cash involves some money. As cash is a very sensitive and volatile asset, most of the firms do maintain separate departments for cash management. All the expenses incurred in running the department e.g. stationary charges, salary to staff etc. forms

part of cash management cost. Higher the size of this department, higher will be the expenses incurred in management of cash.

4. **Excess Cash Balance Costs**: In case a firm is maintaining excess cash balance with itself even then it is bearing some cost. This cost is in the form of opportunity cost i.e. the interest lost which the firm could have earned by investing the surplus cash in some profitable investment opportunities.

4.5 Methods For Estimating The Cash Requirements

There are a number of methods which are being used for the estimation of cash requirements like Miiler or Orr model, Minimizing Cost Model, Minimizing Cost Model with Precautionary Balances and Cash Budget. Out of these methods the one which is used most frequently is the Cash Budget and therefore only Cash Budget has been discussed here.

4.5.1 Cash Budget:

Cash Budget is a planning tool in the hands of management of a business organization. As we have discussed earlier, the objective of cash management is to ensure that the firm has optimum balance of cash only i.e. neither the firm has excess cash balance nor shortage of cash at any stage. Cash budget is a statement of estimated cash inflows and cash expenditure over the firm's planning horizon and it helps the business organization in identification of periods when there will be excess cash and also those periods when there will be shortage of cash. After identification of cash surplus and cash shortage periods firm will be in a better position to do the appropriate planning for cash.

The objectives of preparing the cash budget are:

i) To identify the period when there is likely to be shortage of cash.

ii) To identify the period when there is likely to be excess cash.

iii) To enable the firm to do proper planning for the procurement of cash at the least possible cost during the periods when there is shortage of cash.

iv) To enable the firm to do proper planning for the investment of cash at the highest possible rate of return when there is surplus of cash.

With advance planning through cash budget, firms get adequate time to take the necessary action for borrowing and lending of cash on the terms most advantageous to it.

Process of Preparation of Cash Budget

1. Planning Period: The first step in the process of preparation of cash budget is the selection of period to be covered by the cash budget and also the sub periods within that time span over which the cash flows are to be projected. There is no fixed rule for this legally or even otherwise. Planning period to be covered varies from firm to firm depending upon the business scale, nature of the business, credit policy and degree of uncertainty involved in the business. Higher the degree of certainty in a business, longer can be the horizon of cash budget and vice-versa. In case of organizations facing extreme degree of fluctuations, cash budget can be prepared even on daily basis.

2. Consideration of Factors having a bearing on Cash Budget: The second step in the process of preparation of cash budget is the identification of the factors effecting cash estimation and the

magnitude of their effect on the cash positions. For the purpose of preparation of cash budget, cash receipts and cash payments can be classified into two categories i.e. Operating and Financial. Operating cash flows are the cash flows associated with the operations of the firm while financial cash flows include cash flows which have resulted from sources other than the operations of the business. The examples of operating cash flows include: receipts from sales, collections from debtors, Payments to suppliers, administrative and selling expenses etc. Examples of financial cash flows include Loan and Borrowings, interest received, Dividend received, interest paid, dividend paid etc.

After the decision is taken about the span of cash budget and also the factors to be considered in preparing the cash budget, one can move ahead and start preparing the cash budget.

Example: Cash Budget

The following is the detailed information of ABC ltd. You are required to prepare the Cash Budgets for the month of May and June:

	April (Actual)	**May (Estimated)**	**Jun (Estimated)**
	Rs.	**Rs.**	**Rs.**
Wages and Salaries	390000	410000	520000
Sales	1200000	1400000	1600000
Purchases	500000	600000	800000
Excise Duty	50000	60000	70000
Income Tax	Nil	Nil	30000
Closing Balance of Cash	450000	-	-

Additional Information

1. 50% of the wages and salaries are payable in next month
2. 50% of the sales are on credit basis. Out of credit sales, 60% are received in the same month at a cash discount of 2%. 20% of the credit sales are received in the next month at a cash discount of 1% and the balance after two months.
3. 50% of the purchases are on credit basis. Out of credit purchases, 50% is payable in the month in which purchase is made, 25% one month after next month and the balance after two months.
4. Excise is payable in the next month.
5. Besides above information, firm is planning to buy a machine in the month of May for which payment will be made in the month of June. The price of the machine is Rs. 200000.

Solution

Cash Budget for May/June

Particulars		**May**	**June**
		Rs.	Rs.
a)	Opening Balance	450000	692900
b)	Receipts		
	i. Cash Sales(50% of Sales)	700000	800000

	ii.	Cash From Debtors	530400	729000
		Total Cash	**1680400**	**2221900**
c)	Payments			
	i.	Cash Purchases	325000	450000
	ii.	Payment to Creditors	212500	337500
	iii.	Wages and Salaries	400000	465000
	iv.	Excise Duty	50000	60000
	v.	Purchase of New Machine		200000
		Total	**692900**	**709400**

4.6 Cash Management – Main Strategies

Cash management is one of the most important tasks in the hands of finance manager . He has always to be in touch with the cash position of his organization and ensure that the cash is being used in the most efficient manner. Efficient use of cash requires immediate collection of cash from wherever it is due and to use the credit period allowed by the suppliers to the maximum. To ensure efficient management and use of cash, some of the major strategies being employed by the business organizations are discussed below:

1. **Speedy Collection of Receivables:** Efficient cash management requires that the firm should try to collect the cash from the receivables as early as possible without loosing future sales because of high pressure collection techniques. Average collection period can be reduced by changing the credit standards, credit terms and collection policies. Credit standard lays down the criteria regarding to whom credit should be extended. Credit term represents the total credit period allowed, incentives for early payment and penalties for delayed payment etc. Collection policies represent the efforts to be made for quick recovery of receivables.

2. **Stretching the Payment to Payables:** The second leg of cash management strategies is to stretch the payment to creditors and delay it to the extent possible. In other words, a firm should pay its account payables as late as possible without damaging its credit standing. It should, however, take advantage of the cash discount available on prompt payment.

Float is one of the main areas to be looked into to ensure efficient management of cash. Float is the delay in the credit or debit of bank accounts for the cheques and drafts and other instruments already issued or deposited for collection. Floats are responsible for the difference between bank balance shown by the pass book and bank balance shown by the bank account maintained by the firms. There are basically three types of floats that create the difference:

Mail Float: The time difference between the postage of cheques by the debtors and the receipt of the same in the business enterprise is called mail float.

Processing Float: Once the cheques are received in the firms then some time is taken by the office people for the processing of cheques. Processing float is the time difference between the time a cheque is received in the firm's office and deposit of the same in the bank. In some cases it has been found that the lethargic employees of the business enterprise took more than 10 days to deposit the cheque in the banks.

Collection Float: Collection float is the time difference between the time a cheque is deposited

into the bank and realization and credit of the same by the bank to the account of the firm. Sometimes cheques given by the debtors are drawn on a bank different from the collecting bank and it takes sometime in those cases for the collecting bank to collect the cheque and deposit the same into the account of customer. In some cases inefficiency of the staff members of the banks has caused a delay of more than a month in the collection of cheques.

The total time involved in the above floats together is called the deposit float. Techniques used for cash management aim at reducing the different types of floats only.

Speedy Cash Collection

In order to manage the cash efficiently, the cash collection process should be accelerated through systematic planning and refined techniques. Cash collection process can be quickened in two ways i.e. first of all customers should be encouraged to make the payment as early as possible and secondly efforts should be made to quickly process and collect the cheques and drafts deposited by the customers. In order to ensure prompt payment from the customers the process of sending bills to the customers should be made fast. What the customer has to pay, time of payment and mode of payment etc should be quickly, accurately and clearly informed to the customer. You may use self addressed envelopes for getting payment through cheques. In order to motivate the customers for prompt payment, trade discount may also be offered to them. Secondly, in case payment is given by the customers in the form of cheques or drafts, systematic process which ensures quick realization of these instruments should be put into place. Within the time that a cheque is mailed by the customer and its realization there are three steps involved into it: a) Transit or mailing time i.e. the time taken by the postal department in transferring the cheque from the customer to the firm (MAIL FLOAT); b) Time taken by the firm in depositing the cheque into bank (PROCESSING FLOAT); c) Collection time taken by the bank (COLLECTION FLOAT). Collection of accounts receivable can be considerably accelerated, by reducing the transit, processing and collection time. Concentration Banking and Lock Box systems can help us in reducing the time involved in floats considerably.

Concentration Banking

This is a system of decentralization of collection of cheques. In case of business organization having large number of branches located at different places all over the country this system helps a lot in the quick collection of money. Branches located at some of the strategic positions are designated for collection of payments from the customers. In this system customers are directed to submit at payments at the collection centers which cover their area and then these cheques are deposited in the local account of the concerned collection centre after deducting all the expenses. A limit is fixed up to which funds remain in the local account of the concerned collection centre and funds beyond that limit are transferred on daily basis to the account of the head office through electronic transfer system. This system of collection of cheques reduces considerably the time involved in mailing process. This concentration banking system reduces not only the mailing time but also the time involved in getting the payment cleared from the banks.

Lock Box System

Concentration Banking helps in reducing the time involved in mailing and collection of payment. But processing time (processing float) is still there as the cheques are collected by the local collection centers and some time elapses between the receipt of cheques and their deposit into the bank. Lock Box system helps in further reducing the deposit float through reduction of processing time. In this system, firms hire a box in some strategically located post offices and customers are required to drop their

cheques in these boxes. An account is opened in bank branches at those places where these boxes are hired and bank branches where these accounts are opened are allowed to open the boxes on daily basis and deposit the cheques in the accounts maintained. After collection of cheques from the box, branch does necessary processing and then deposit the money in the account of the firm. This way lock box system helps not only in reducing the time involved in mailing and collection float but also the time involved in processing float as the firm staff will not be doing processing of instruments.

Lock Box system is advantageous because of the following two merits i.e. a) the bank performs the clerical task of processing the remittances prior to deposit and the firm staff is saved of this botheration. No doubt bank may be taking some charges for this service but bank people will be able to do it a lower cost and in less time. b) The process of collection of cheques begin immediately after the receipt of cheques by it and the time taken by the firm staff in processing of these instruments is saved.

Slowing Disbursement

Other leg which can be used as a part of strategies to ensure efficient management of cash is slowing down the disbursement process without compromising with the credit rating of the organization. Strategies which can be used to slow down the disbursement process include :

Avoidance of Early Payments

According to the terms of credit, some credit period is allowed to the buyers. If the firm delays payment beyond the credit period its credit standing gets adversely affected and if the firm gives the payment before the due date, it looses the opportunity to earn some extra income which the firm could have earned by investing the money in some income generating avenue for the period for which it could have enjoyed credit without compromising with the credit rate.

Centralized Disbursements

Secondly, firm may adopt a centralized system for making payment to its creditors. Such a payment system would enable the firm to delay payments and conserve cash for several reasons. a) It involves transit time. The remittances from head office to the customers in far off places would involve more time than a decentralized payment system. b) In this system, since the firm has centralized payment system it will be able to carry on its business by keeping very small cash balance. In case of decentralized payment system some minimum balance of cash will have to be maintained by it at all the branches.the advantages of concentration banking.

4.7 Motives for Holding Inventory

Inventory is again one of the major assets in an organization. Inventory may be defined as the stock of assets that will be sold in the coming times to the customers. In case of a manufacturing concern, inventory may be classified into three categories i.e. raw material, work in progress and finished goods. Where as in the management of other current assets the major role is of finance manager, on the other hand inventory management is a multi-departmental task. All the functional areas like Finance, Marketing, Production and Purchasing are involved. The task of manager finance is to bring in synchronization in the conflicting views of the various functional areas regarding the appropriate level of inventory in order to fulfill the overall objective of maximizing the wealth of the shareholders.

Following are the motives for holding inventory

1. **To Ensure Perpetual Production**: In case of manufacturing units, the continuance of the production

process depends upon the availability of Inventory. In case of non-availability of sufficient inventory production process will become stand still and the firm will have to face financial loses at least equal to the fixed expensed incurred by it and secondly in case it becomes impossible to meet the demand of the customers, it may loses reputation and market base.

2. **To ensure that the Orders of the Customers are met**: In case of trading organizations inventory is kept to ensure that the orders of the customers are met in time and as and when they come.

3. **To Get Benefit of Reduced Prevailing Prices**: Sometimes because of seasonal factors and large supply of the raw material, its price in the market gets reduced. Firms purchase huge quantity of raw material so that it does not have to buy it at high prices in the future. The raw material so purchased is stored for its future use.

4.7.1 Objectives of Inventory Management

Inventory is one of the main current assets in most of the organizations. In some cases investment in inventory involves crores of rupees and constitute around 70-80% of the total current assets. The major focus in inventory management should be the inventory turnover and efforts should be made to quickly rotate the inventory. To be more policy the objectives pf inventory management are :

1. To minimize the firm's investment in inventory
2. To meet the demand for the product/raw material by efficiently organizing the production and/or sales schedule.

The above two objectives of inventory management are mutually contradictory and finance has to strike a balance between these two. The first objective to minimize the investments in inventory will help the firm in maintaining the cost at the lowest possible level i.e. cost of storage and the maintenance of inventory will be the least. Higher the level of inventory higher will be the cost of inventory management to the firm and vice-versa. On the other hand, large level of inventory provides benefits to the firm and facilitates the smooth running of the production process and therefore the smooth running of the firm. Therefore the task of manager manager is to determine the optimum level of inventory on the basis of trade off between costs and benefits associated with the level of inventory.

4.8 Cost of Holding Inventory

As discussed in the previous section, manager finance has to strike a trade off between costs and benefits associated with the level of inventory. The various costs and benefits associated with holding inventory are as explained below:

Cost of Holding Inventory

The major objective of inventory management is to minimize the cost involved in inventory management. The costs associated with inventory management are categorized into two categories i.e. Ordering Cost and Carrying Cost. **Ordering** Cost is the cost incurred in acquisition of inventory. This cost is also known as acquisition cost. Whenever, level of inventory falls below certain prescribed minimum balance, firms have to place an order for the acquisition of fresh inventory. All the expenses incurred in acquiring the fresh stock of inventory is called inventory. In the ordering cost, we may include expenses incurred on preparing the purchase order, expenses incurred on receiving, inspection and on recording the goods. Ordering cost is generally fixed per order. The ordering cost is directly related to the number

of orders placed. **Carrying Cost** is the cost involved in maintaining or carrying inventory. This cost is also known as holding cost as the components of this cost include expenses incurred on holding the inventory. Holding cost or carrying cost include the following components i.e. storage cost, tax, depreciation, insurance, maintenance charges of godown, deterioration in inventory because of fire, obsolescence, theft etc. besides these expenses carrying cost also includes opportunity cost of funds i.e. the funds blocked in the purchase of inventory might have been invested some where else and some returns could have been earned which had to be forgone.

4.8.2 Advantages of Holding Inventory

There are three major functions in an organization which are tied to each other i.e. Purchase, Production and Sales. Holding of inventory helps the firm in untying these three functions. These three functions are so tied to each other that they can affect the efficiency of each other. Purchase and production both depends upon sales. If sales are more, firm has to increase the production/purchase and vice-versa. In the short run inventory helps us in decoupling these functions and then each of these function can be performed in accordance with the procedure most helpful in enhancing the efficiency of that function only. In simple words we can say that inventories enable firms in the short run to produce at a rate greater than the rate of purchase of raw material and sell at a rate greater than the rate of production. Since firm is holding inventory and therefore purchase is not tied up with production, firm can carry on both the purchase and production independently to ensure the most efficient purchase and production. Firm can purchase as and when it is available at a less cost and further it can purchase large or small quantity depending upon the advantages of both to the firm. **Advantages of Holding Inventory in Production Process**: holding of inventory helps in improving the efficiency of the production process. Inventory of finished goods helps in untying the production from sales. This enables to carry on the two activities at different rates according to the suitability of each other. This is very useful for the seasonal industries. In case of seasonal industries demand is more during peak season and less during off season. In case firm continues its production activities during off season and keep on building the stock to meet the demand of peak season it is more economical. Firm will not have to bear the cost of discontinuities in production process. **Advantages of Holding Inventory in Sales**: The maintenance of inventory also helps in enhancing the efficiency of the sales function. In case a firm is not maintaining inventory then the sales will be tied to level of production. In case the demand of the product increases beyond the level of production then the firm will not be able to meet demand. If the firm has inventory, then sales will not have to depend upon the rate of production. One of the major requirements for the survival of a firm, in today's highly competitive environment, is its ability to meet its customers demand in time.

The main task in inventory management is to minimize the investment in inventory and at the same time insure that the firm has sufficient inventory to take care of the demand from the production department and/or the customers.

4.9 Factors Affecting Inventory Management

1. **Nature of The Product:** The nature of product greatly effect the quantity of inventory to be maintained like in case of perishable of goods it is not feasible to store large quantity of the product as there are high chances of it getting spoiled and secondly even if it is to be stored a very high cost will have to be incurred on its preservation. In case of durable products, we can keep any level of inventory as the chances of products of durable nature getting spoiled are meager. But even in case of those products of durable nature, where the chances of product getting obsolete are very high, level of inventory maintained should not be very high.

2. **Automation of Production Process**: In case of highly automated production process, wherein goods can be produced at a very high speed, one can afford to have low level of inventory with itself. In such cases, if any demand of the product emerges, it can be met without much difficulty as the process is highly automated and can help us in completing new stock in a very less time. In case of manufacturing processes involving manual work or in case of those firms, where old techniques and/or machinery is being used for production, firms will be required to maintain sufficient level of inventory as the production process is slow and if any sudden demand emerges it will not be able to meet the demand.

3. **Availability of the Product**: In case of raw material or product, as the case may be, being dealt with is of such a nature that it is available easily in the market throughout the year, then the firm need not bother much about its inventory level and Just in Time system of inventory management many be followed. In case of products/raw material which is not available through out the year or in case of products which are difficult to procure may be because of their demand or may be because they have to be procured from very far off places, firm need to maintain very high level of inventory.

4. **Degree of Certainty in Business**: In case of businesses involving high degree of uncertainty regarding availability of raw material and/or the demand of the product, firm need to maintain high level of inventory. In case of businesses, where some certainty is there regarding the availability of raw material and the demand of the product being dealt in by the business, proper planning of the inventory can be done.

5. **State of Economy**: In case of booming economy, firm will be required to maintain high level of inventory as there are high chances of emerging large orders and vice-versa.

6. **Value of Product:** In case of high value product, firm cannot afford to have large inventory. In case of low value products, firm may afford to keep in stock large quantity of the product.

4.10 Techniques of Inventory Management

A number of techniques are being used in the industry to manage the inventory. But most of these techniques come within the ambit of production department. Few of the techniques like Classification of Inventory, Fixation of various types of inventory levels etc. which can be employed by finance manager for inventory management are discussed below:

ABC System

The classification of inventory into various categories help in efficiently managing the inventory and in determining the type of control required. In ABC system of inventory classification and management, inventory is classified into three categories i.e. A, B and C. The classification of inventory into these categories is based on the cost factor. The items included in category A are those items which involve very high cost and requires very intensive degree of control. In the category C are included those items which relatively has very small value and fairly large quantity. Class B comes in the middle. There more of the attention is required to be given to items included in category A and in decreasing order to class B and C.

Economic Order Quantity(EOQ)

Economic order quantity is the quantity to be purchased in one order. As discussed earlier, inventory management involves two types of expenses i.e. Holding cost and Ordering Cost. EOQ is that order of

quantity which helps in minimizing the overall holding and ordering Cost.

Economic order quantity is also known as economic lot size. Economic Order Quantity may be defined as that level of inventory order that minimizes the total cost associated with inventory management. How to find out the economic order quantity? There are two approaches to do it, the first approach is trial and error method and the second approach is formula based.

In case of trail and error approach, the ordering and holding cost of different sizes of orders to purchase inventory is calculated and the order-size with the lowest total cost of inventory is the economic order quantity.

In the second approach we can use the formula as given below for the purpose of calculation of economic order quantity i.e.

EOQ = +"2AO/C

A = Annual Demand, O = Per order cost and C = Per Unit Carrying Cost.

Example

A firm's inventory planning period is one year. The inventory required by the firm during this one year is 2000 units. One order will cost Rs 100 to the firm and the carrying cost will be Rs 1 per uint per year. Calculate the economic order quantity.

EOQ = +"2X2000X100/1 =632 units

Economic order quantity helps us in determining how much quantity of stock should be ordered in one order so that the total of ordering and carrying cost is the minimum.

Besides deciding about how much quantity to be purchased in one order? Firms will also be interested in knowing. When to place an order? What should be the minimum level of stock? What should be the maximum level of stock? All these questions can be answered using the following formulas.

When to place an order or in other words we can say what is the reorder level of inventory? Reorder level of inventory can be calculated using the following formula:

Reorder Level = lead time in days x average daily usage of inventory

Lead time means the time taken by the new inventory to reach the godown after the placement of an order. In simple words we can say the total time taken by the supplier to make the goods available in the godown of buyer after an order is placed. Average usage means the quantity of goods consumed on daily basis.

Safety stock also known as buffer stock is that quantity of stock below which the level of inventory should never falls. In case the level of inventory lying in the stock falls below this level there is every chance of production getting stopped and personal efforts should be made to procure the fresh batch of stock once the inventory touches safety stock level.

Besides all these levels, for proper management of inventory firm my also fix maximum stock level i.e. the maximum quantity beyond which level of inventory will never be allowed to rise, minimum level i.e. the minimum quantity which should always be there in the godown at all the times etc.

4.11 Meaning of Receivables and Its Cost and Banejits

Receivables mean the amount recoverable by a business enterprise from its customers for the goods sold by it on credit to them in the ordinary course of business". Receivables can be defined as "money owed to the business enterprise by its customers which has arisen from the sale of goods and/or services in the normal course of business". In the normal course of business, firms do extend credit to their customers to enhance the volume of sales. The sale of goods on credit, no doubt has been there since times immortal, has become an integral part of business processes in the present day highly competitive world. In case of business enterprises, credit sales are made on open account i.e. no document acknowledging the debt or financial instrument is created. The **objective of Receivables Management in** To promote sales on credit upto that level where the return on investment in further funding of receivables is less than the cost of funds raised to finance that additional credit.

Costs and Benefits

Costs and benefits which are relevant in the receivables management part are discussed below:

Costs: Costs associated with receivables management are classified into four categories i.e. Collection cost, Capital cost, Delinquency cost and Default cost. **Collection costs** are basically the administrative expenses incurred in collecting the money due from customers. Expenses included in the category of Collection costs are expenses incurred in maintaining and running the credit department, expenses on stationery, accounting records, postage etc. and also included in this category are the expenses incurred in acquiring the credit information etc. **Capital Cost**: Sale of goods on credit involves investment of money in receivables. Higher the sales on credit is higher is the investment of money in receivables. The additional capital invested by the firm to support credit sales involves some cost and cost of capital invested by the firm to support credit sales is referred to as the cost of capital. **Delinquency Cost** is another category of cost associated with extending credit to customers. In case a customer fails to pay his liabilities on the due date, it is referred to as delinquency cost. Delinquency cost include cost incurred due to blocking-up of funds for an extended period and costs incurred on efforts made for initiating the process to collect the over dues i.e. expenses incurred in issuing the reminders, legal charges etc. **Default Cost**: In case the firm is unable to recover the dues, then the cost incurred on money lost due to non-recovery is called the default cost.

Benefits

The main benefit of selling goods on credit is to enhance the sales. Where as the liberal credit policy helps the firm in enhancing its credit sales on the other hand it also helps the firm in retaining its present business. Increase in sales and retention of existing sales help the business enterprise in increasing its profits.

Aim of finance manager in receivables management is to strike a trade off between profits resulting form credit sales and the costs associated with selling goods on credit. The decision to commit funds to receivables is required to be based on benefits and costs involved in extending credit. Comparison of costs and benefits should be made on marginal costs and benefit basis.

While external economic environment and industry practices have a strong impact on the level of receivables, the internal policy and management practices also have a strong bearing on the receivables management in a company. The crucial areas in receivables management of a company include: Credit Policies, Credit Terms and Collection policies.

4.12 Areas in Receivable Management

The following areas need speific attention in receivable management

Credit Policies

Credit policy of a firm includes framework which helps us in deciding a) Whether or not to extend credit to a customer b) how much credit to be extended. The credit policy of a firm has two main dimensions i.e. Credit Standards and Credit analysis. **Credit Standard** includes criteria for extension of credit to customers. The bases on which credit standards are established include credit rating, reference, and some financial ratios etc. Credit standards can be classified into two categories i.e. tight and liberal credit standards. In case of tight credit standards, availability of goods on credit is not easy, whereas in case of liberal credit standards goods can easily be purchased on credit from the firm. While deciding whether to go in for liberal standards or tight standards, firms have to strike a balance between costs and benefits associated with receivables management. Four factors which are considered while deciding the credit standards include the collection cost, average collection period, quantum of losses due to bad debts and level of sales. Quantum of collection costs will be more if the credit standards are liberal and vice versa. Similarly, if the credit standards are loose, more investment will go in for the receivables and if the credit standards are tight investments in the receivables will be less. Looking at the quantum of funds available with the firm for investment in receivables firm can keep the standards loose or tight. Bad debt looses are looses due to non repayment of the money by the creditors. The quantum of bad debts is directly linked with the quantum of sales. Higher the sales, higher are the quantum of bad debts. Ifcredit standards are liberal, there will be more credit sales and there will be more chances of high bad debts. Volume of sales is again directly linked with the credit standards, liberal the credit standards more will be the sales.

Credit Analysis

Besides credit standards firms also develop procedures for doing credit analysis of the applicants. There are two basic steps involved in credit analysis i) Obtaining credit information and ii) Analysis of credit information. Credit information about the customer can be obtained from internal and external sources of information. Internal sources of information include forms and documents which may be given by a firm to its customers, customers may be required to give trade references i.e. references of those trader with whom they are already dealing, firm's own records in case of applicants already having dealing with the firm. External sources of information may include information from other institutions with which customer has dealt in the past, Financial statements of the customer, Bank References etc. Once the entire credit information has been collected, efforts should be made to analyze this information to determine the credit-worthiness of the buyer. The credit analyseis part should cover the two aspects i.e. quantitative and qualitative.

In quantitative aspects, firm may conduct analyses of the financial statements of the customer. It may do ratio analysis, liquidity analysis and profitability analysis. Quantitative assessment should be supplemented by qualitative analysis of the borrower. Reference about the buyer from the band references, trade references and reports from some specialized agencies may be used to form an opinion about the buyer.

Credit Terms

Credit terms mean the conditions upon which credit is to be extended. Firm must establish the

terms and conditions upon which goods are to be sold on credit before making any credit sales. Credit terms refer to the repayment of the amount under the credit sale. It will include maximum credit period allowed, cash discount if any the period within which it can be claimed. Therefore, there are mainly three components in the credit terms i.e. credit period, cash discount and the cash discount period.

Collection Policies

Collection Policies is the third area involved in the receivables management. Collection policy includes the framework regarding efforts to be made to recover the dues from the buyers after the due date. The collection policy may provide framework regarding two types of aspects concerning collection efforts i.e. degree of collection efforts and types of collection efforts. To collect the over dues firm may go in for strict collection efforts or lenient collection efforts. Strict collection efforts will help in reducing the losses due to bad debts and vice-versa. Types of collection efforts include steps to be taken to recover the money after the due date. The types of collection efforts made generally include) Issue letters/Reminders) Making telephone calls) Personal visits and) legal action etc. Efforts should be made to recover the money as early as possible and at the same time care should be taken to ensure that the relationship with the customer does not become under any strain. Also genuine difficulties of the customers should be handled with great care.

4.13 Summary

Cash due of the most important component of working capited in an organization and is the most sensitive asset. Basically there are the five pirprosa for which business organization keep cash with themselves. Out of the number of methods being used for the estimation of cash requirement cash budget in most frequently used. The aim of finance managers in cash management is to minimize the investments in cash and at the same time ensure that the firm has sufficient liquidity.

Inventory in the stock help by an organization in goods. Because of huge investment involves in inventory many organizations give special emphasis to the management of inventory. The finance manger the inventory and the benefit of holding the inventory. In order to manage the inventory efficiently, a large number of technique are being employed.

Receivables refer to the amount recoverable from the arstomns of the firm for the goods sold to them on orbit duing the normal covrk of Burien operation. The objectives of receivable management in to maximize the jaler and profit of the firm and at the same time to retain the cash.

4.14 Key Words

- **Transaction Cost:** It is the cost which is incurred in raising the money to overcome the shortfall.
- **Cash Budget:** it is a statement of estimated cash inflows and cash expenditure over the firm's planning horizon.
- **Processing Float**: Processing float in the time difference between the time a cheque in received in the firm's office and deposit of the same in the bank.
- **Ordering cost:** it is the cash incurred in acquisition of inventory

- **Economics order Quantity:** it is that order of quantity which helps in minimizing the overall holding and ordering cost
- **Re-order level:** Reorder level is that level of inventory at which new orders for the procurement of fresh stock should be placed.
- **Collection cash:** Administration expenses incurved in collecting the money due from customer.
- **Credit Terms:** stipulation upon which credit is extended
- **Credit standard:** specify the criteria for extension of credit of customers.

4.15 Self Assessment Test

1. What are the factors which affect the cash balance to be hold by the business organizations?
2. Define a cash budget. Explain the process of preparing the cash budget with the help of a hypothetical example.
3. Explain the various types of cost a firm has to incur in case of shortage of cash.
4. the cash if a finance manages is to fencile the two conflicting objectives so far as inventory management is concerned. What are these two objectives? How the reconciliation between these objectives is mode?
5. Explain the various technique used for inventory management.
6. Write a note on the cash and benefit associated with receivables management.
7. What are is the firms credit stand arch? What factors standorch of a firm?

UNIT - 5 : COST OF CAPITAL

Unit Structure

5.0 Objectives

At the end, the students would be able to understand the

- Concept of Cost of Capital
- Various factors influencing Cost of capital and its Significance
- Determination of Cost of Capital
- Calculate the WACC of a given capital structure

5.1 Introduction

Cost of capital is the minimum rate of return expected by investory, the suppliers of capital. In other words, it is a price for obtaining capital. It is a compensation for time and risk. Investors are of different categories and their risks are different. A decision to invest in a particular project depends upon the cost of capital of the firm or the cut off rate which in the minimum rate of return expected by the invertors.

5.2 Concept of Cost of Capital

Cost of capital is the key concept in financial decision making. It is useful from the point of view of both investment as well as financing decisions. It indicates the minimum required rate of return that the various investment proposals should earn.

In economic terms, from an investor's point of view, the cost of capital is the measurement of the sacrifice made by him in order to invest to get a fair return in future on his investments as a reward for the postponement of present needs. On the other hand, for the firm using the capital, it is the price paid to the investor for the use of capital provided by him.

Technically, it is also the rate of return, the firm requires from investment in order to increase the value of the firm in the market place. For example if a firm borrows Rs 10 lakhs at an interest rate of 12%, then the cost of capital is 12%. Here it becomes necessary for the firm to earn atleast Rs 1, 20,000 *i.e.* ROR at 12%. If the return is less than this, then the rate of dividend the shareholders are receiving will go down with a resultant downfall in its market value. Hence, cost of capital is rightly called the cut off rate for capital expenditures. Therefore, Solomon Ezra has rightly defined cost of capital as the minimum

required rate of return or cut-off rate for capital expenditures.

Salient Features of Cost of Capital are

- The cost of capital is not a cost as such. It is the minimum required rate of return which is essential to maintain the market value of equity shares. Hence, it is also called the ***hurdle rate***.
- It is made up of three components

  a) Risk free rate = rf

  b) Premium for taking up risky proposals i.e. business risk = B

  c) Premium for employing financial leverage, i.e. Financial risk = F

  Following equation shows the relationship between the different components,

  Ko = rf + B + F

5.3 Different Concepts of Cost of Capital

The different cost concepts are classified below:

1. **Future Cost & Historical Cost**: Future Cost is an expected cost of funds which may be incurred for raising funds in future. They are relevant costs for financial decision making. On the other hand, Historical Costs are expired costs which are already incurred for financing an investment proposal. Though they are not relevant costs, they help in projecting future costs with an appraisal of past performance.
2. **Specific Cost & Combined Cost**: the cost of each source of capital is called specific cost of capital like cost of debt, cost of preferred stock, cost of equity etc. whereas the combined cost is the weighted average cost of capital of the different sources of long term finance employed by the firm.
3. **Explicit Cost & Implicit Cost**: the explicit cost of capital is the internal rate of return which a firm pays for procuring finances. If a firm takes interest free loan, its explicit cost is zero percent as no cash outflows in the interest rate is involved. Hence it is the discount rate which equates present value of cash inflows with outflows. On the other hand, implicit cost is the rate of return associated with the best investment opportunity for the firm which will be sacrificed if the present investment proposal is accepted. Hence it is an opportunity cost.
4. **Average Cost & Marginal Cost**: The average cost of capital is the weighted average costs of each component of funds employed by the firm. The weights are in proportion of the share of each component of capital in the total capital structure. On the other hand, Marginal cost of capital is the weighted average cost of new funds raised by the firm. For capital budgeting and financing decisions, the marginal cost of capital is the most important factor to be considered.

5.4 Factors Affecting Cost of Capital

The important factors which affect the cost of capital of a firm are enumerated below:

1. **Nature of Business**: Firms that require heavy investments in fixed assets bear a high cost of funds in comparison to firm which require low investments in fixed assets.
2. **Requirements of the firm**: Firms requiring large amount of funds consequently bear higher cost compared too firms requiring less amount of funds because large fund requirements lead to heavy

external borrowings.

3. **Attitude of management**: If the management of the company is aggressive, it will have less liquid funds thereby decreasing its total cost whereas, a conservative management will keep large amount of funds leading to increase in total cost.

4. **Financing Mix decision**: The overall cost of capital of the firm is decided on basis of proportion of different sources of funds. The high proportion of high cost funds will increase the total cost and low proportion of high cost funds will decrease the total cost.

5. **Business Risk & Financial Risk**: If the business risk of a firm is high, its cost of capital increases and as the financial risk increases bankruptcy risk also increases for a given firm. Higher the risk of bankruptcy, higher is the cost of capital.

5.5 Significance of Concept of Cost of Capital

The primary function of every finance manager is to arrange adequate capital for the firm from various sources of funds at the lowest possible cost and maintaining the market value as well. Therefore, the decision of cost of capital is relevant in the following areas:

1. **Designing the capital structure**: In designing the capital structure of a firm, the management has to consider the objective of maximizing value of the firm and minimizing the cost of capital. The finance manager can select the best source of finance and can design a sound and balanced capital structure by comparing the various specific costs of different sources of capital.

2. **Capital Budgeting Decisions**: The acceptance or rejection of any investment proposal depends upon the cost of capital. A proposal shall not be accepted till its rate of return is higher than the cost of capital.

3. **Comparative study of sources of financing**: Cost of capital is an important factor in deciding the source of finance. Out of various sources available, which source has to be used is decided by comparing the costs of different sources of financing.

4. **Evaluation of financial performance of top management**: Cost of capital helps in evaluating the performance of top management by comparing the actual profitability of the project with the actual cost of capital of funds raised to finance the project. The performance is rated as satisfactory when actual profitability of project is more than the actual cost of capital.

5. **Financing and Dividend decisions**: Other important financial decisions can also be taken with the help of cost of capital such as regarding dividend policy, capitalization of profits and selecting different sources of capital.

5.6 Computation of Cost of Capital

The major sources of finance are debt, preference shares, equity shares and retained earnings. Hence, the cost of specific sources would be the cost of debt, cost of preferred stock, cost of equity and cost of retained earnings.

Assumptions: While computing the cost of capital, the following assumptions are made

- The cost can be either explicit or implicit.
- The financial and business risks are not affected by investing in new investment proposals.
- The firm's capital structure remains unchanged.

- Cost of each source of capital is determined on an after tax basis.
- Costs of previously obtained capital are not relevant for computing the cost of capital to be raised from a specific source.

The explicit cost of a source of finance would be calculated by discounting the cash flows at discount rate, which will equate the present value of cash outflows with present value of cash inflows. There exist some approximate methods to calculate the various sources of finance.

5.6.1 Cost of Debt Capital

Debt may be in the form of debentures, bonds, term loans from financial institutions and banks etc. it may be raised at par, at premium or at a discount. The cost of debt is the rate of return expected by the lenders. It is the interest rate specified at the time of issue. The debt may also be redeemable or perpetual debt. Therefore, the cost of debt can be defined in the terms of the required rate of return that the debt financed investment must yield to prevent damage to the shareholders position. Since the interest charges are allowed for tax purposes, the effective cost of capital would always be the after tax cost of debt.

But the real cost of debt can be identified with net proceeds from the issue of debentures. The net proceeds is equal to the issue price of the debentures or amount of loan minus all floatation costs. The floatation costs are the cost of issuing debentures or obtaining loans. These are generally expressed as percentage of face value. In nutshell, the net proceeds in different situations can be calculated as under –

At Par = Par value – Floatation costs

At Premium = Par Value + Premium – Floatation costs

At Discount = Par Value – Discount – Floatation Costs

Further the cost of debt capital will be calculated on the basis of average capital. The average capital is computed by dividing the total of net amount received at the time of issue and amount payable on maturity by two.

- **Cost of Redeemable debentures:** when debentures are repayable after a specified period of time at par, or at discount or at premium, the following formula may be used

$$Kd = R + \frac{\{MV - NP\}/n}{\{MV + NP\}/2} \times 100$$

Where, Kd = Cost of debt

MV = Maturity Value of debt

NP = Net Proceeds

n = Number of years to maturity

R = Annual interest payment

1. **When debentures are issued at discount**, the net amount realized at the time of issue will be less than the amount to be paid on maturity. Therefore, the annual average of the difference between these two amounts (MV – NP) will be deducted from the interest payable per year and the cost of capital will be calculated on average capital.

Illustration 1: Shri Ram company issues 12% debentures of Rs 5,00,000 repayable after 10 years at a discount of 4% and incurs Rs 10,000 for underwriting, brokerage etc. corporate tax rate being

30% then, the cost of debt capital will be –

Solution:

$$Kd = \frac{60,000 + (5,00,000 - 4,70,000)/10}{(5,00,000 - 4,70,000)} \times 100$$

$$= \frac{60,000 - 3,000}{4,85,000} \times 100 = 13\% \ (approx)$$

Kd (after tax) = Kd (before tax) x (1-t) = 13% x (1-0.3) = 9.1 %

2. **When debentures are issued at par**, and there is no floatation cost, the cost of debt capital as calculated by the above formula will be equal to the contractual rate of interest as verified below

3. **If debentures are redeemable at premium**, the amount payable at maturity will be calculated by adding premium to be paid on maturity in face value (whether issued at any price).

   Example: Using the figures of the above example, the cost of debt capital when issued at par and redeemed at 5% premium will be,

$$Kd = \frac{45,000 + (5,25,000 - 4,90,000)/10}{(5,25,000 + 4,90,000)/2}$$

$$= \frac{45,000 - 3,500}{5,07,500} \times 100 = 8.17\% (approx)$$

   Calculate Kd (after tax).

* **Cost of Perpetual Debt** – Debentures which cannot be redeemed during the life time of the company shall be ascertained by dividing the amount of interest by the net proceeds

$$Kd = \frac{Interest}{NP \ or \ MP}(1 - t)$$

Where, Kd = Cost pf debt

NP = Net Proceeds

MP = Market Price

t = tax rate

From the above equation, the market price of debenture may be calculated as

$$MP = \frac{Interest}{Kd}$$

Illustration 2: A company issues 9% irredeemable debentures of Rs 100 each for Rs 5 lakhs. The company's tax rate is 40%. Calculate the cost of debt (before as well as after tax) if the debentures are issued at (a) par, (b) 5% discount, (c) 10% premium.

Solution:

$$Kd\ (after\ tax) = \frac{Interest}{Net\ Proceeds} \times 100$$

Kd (after tax) = Kd (before tax) x (1-t)

(a) Issued at par

$$Kd\ (before\ tax) = \frac{45000}{500000} \times 100$$

Kd (after tax) = 9% (1 - 0.4) = 5.4 %

(b) **Issued at 5% discount**:

$$Kd\ (before\ tax) = \frac{45000}{475000} \times 100 = 9.47\%$$

Kd (after tax) = 9.47% (1 – 0.4) = 5.68%

Net Proceeds = Rs 5, 00,000 – 25,000

(Discount @ 5% on Rs 5 lakhs) = Rs 4, 75,000

c) Issued at 10% premium:

$$Kd\ (before\ tax) = \frac{45000}{550000} \times 100 = 8.18\%$$

Kd (after tax) = 8.18 % (1-0.4) – 4.91%

Illustration 3: A company issues 12% debentures of Rs 5 lakhs at par and incurs Rs 10000 as issue expenses, the cost of debt capital will be : -

$$Kd = \frac{60,000}{4,90,000} \times 100 = 12.24\%$$

Interest = 5, 00,000 X 12% = Rs 60,000

NP = Rs 5, 00,000 – 10,000 = Rs 4, 90,000

5.6.2 Cost of Preference Share Capital (Kp)

Preference shareholders enjoy preference rights as regards payment of dividends and return share capital. The preference shares may be redeemable or irredeemable preference shares and cumulative or non cumulative shares. However, there are no contractual obligations to pay preference dividend. The cost of preference capital is calculated based on the preference dividend and dividend is not allowed for tax purpose, hence effective cost of preference share capital would be the cost before tax.

1. **The cost of Perpetual Preference Share Capital:** The dividend expected by preference share-holders is the cost involved and it should be computed, in case of irredeemable preference shares, by establishing the relationship between annual dividend income and net proceeds of their issue. The following formula is used –

$$Kp = \frac{DPS}{NP} \times 100$$

Where, DPS = Dividend per share

NP = Net Proceeds

Illustration 4: A company issued 10% preference shares of Rs 100 each for Rs 5, 00, 000.

Calculate the cost of preference capital when they are issued at (a) par, (b) 5% premium, (c) 5% discount.

Solution:

(a) when preference shares are issued at par:

$$Kp = \frac{DPS}{NP} \times 100$$

$$= \frac{50,000}{5,00,000} \times 100 = 10\%$$

(b) When preference shares are issued at discount:

$$Kp = \frac{50,000}{4,75,000} \times 100 = 10.53\%$$

(c) when issued at premium :

$$Kp = \frac{50,000}{5,25,000} \times 100 = 9.52\%$$

2. Cost of Redeemable Preference share capital: As per Companies (amendment) Act, 1996, issue of irredeemable preference shares has been abolished**.** Therefore, in practice only redeemable preference shares are issued. Such shares are redeemed at maturity date either at par or premium. Therefore, the cost of capital is computed in the same way as in case of redeemable debentures. Only the word D – Dividend is used in place of Interest (R) in the formula.

$$Kp = \frac{D + (MV - NP)/10}{(MV + NP)/2}$$

Where, Kp = Cost of redeemable preference shares

MV = Maturity Value of debt

NP = Net Proceeds

n = Number of years to maturity

D = Annual dividend payment

Illustration 5: Shyam Ltd issues 50, 000 10% preference shares of Rs 100 each redeemable after 10 years at a premium of 5%. The cost of issue is Rs 2 per share. Calculate the cost of preference share capital. Assume 30% corporate tax rate.

$$Kp = \frac{10 + (105 - 98)/10}{(105 + 98)/2} \times 100 = 10.54\%$$

$$\text{Kp (after tax)} = \text{Kp (before tax)} \times \frac{1}{(1-t)}$$

$$= 10.54\% \times \frac{1}{(1-0.3)} = \frac{10.54}{0.7} = 15.057\%$$

5.6.3 Cost of Equity Share capital

Equity shareholders are the owners of the company. There is no contractual obligation on the part of the company to pay dividend to the shareholders. Therefore, the computation of cost of equity share capital becomes difficult because the dividend rate is not predetermined. Therefore, some financial experts are of the opinion that equity share capital holds no cost. But this is not true. The shareholders commit their funds expecting high dividends and appreciation of value of shares. It becomes imperative on the part of company to pay dividend and maintain its growth. Thus, cost of equity capital may be defined as the minimum rate of return that a firm must earn on the equity financed portion of an investment in order to leave the unchanged market price of its shares. The cost of equity capital can be computed by the following methods:

1. Dividend Yield Model :

It is also known as "Dividend/Price Ratio" or "D/P Ratio" method. Under this method, the investors estimate the market value of an equity share by capitalizing the set of dividend payments. The cost of capital will be the expected rate of dividends, which will maintain the present value of equity shares. As per this method, the cost of capital is defined as the discount rate that equates the present value of all expected future dividends per share with the net proceeds of the sale or the current market price of a share.

Moreover, this approach does not seem very logical as it fails to consider the growth factor in dividend payment and also ignores the relevance of retained earnings.

Symbolically,

Cost of Equity Capital (Ke) = [DPS / NP or MP] x 100

Where, DPS = Dividend per share, NP = Net Proceeds, MP = Market Price.

Therefore, Market Price may be calculated as:

MP = DPS / Ke

For example, if a company issues 4, 00, 000 equity shares of Rs 10 each and the current market price of these shares is Rs 15 per share. If the company has paid dividend at the rate of Rs 1.20 per share, the cost of equity share capital would be

$$Ke = \frac{1.20}{15} \times 100 = 8\%$$

Illustration 6: A company issues equity shares of Rs 10 each at a premium of 50%. The company incurs 2% of the issue price as expenses. If the rate of dividend expected by the equity shareholders is 20%, calculate the cost of equity capital.

Solution:

Ke = [DPS / NP] x 100

DPS = Rs 2 per share [20% of Rs 10]

NP = Rs 10 + Rs 5 [50% premium] – 0.30 [2% of issue expenses on Rs 15 per share]

Ke = [2 / 14.70] x 100 = 13.61%

2. Earnings Yield Method: Under this model, the earnings per share are used to estimate the mar-

ket price of the share. Equity shareholders have full right in the income whether they get only part of it as dividend. Therefore, computation of cost of capital only on the basis of dividend is not justified. Hence, under this method, the future expected earnings are related to the market price of the shares.

It is also called 'Earnings Price Ratio' or 'E/P ratio' method. Symbolically,

$$Ke = \frac{EPS}{MP} \times 100$$

Where, EPS = Earning per share, Mp = Market Price per share.

Illustration 7: A firm is currently earning Rs 2, 00, 000 and its share is selling at a current market price of Rs 200. The company has 10, 000 shares outstanding and has no debt. It decides to raise additional funds of Rs 5, 00, 000. If the floatation costs are Rs 10 per share and the company can sell the share for Rs 180, what is the cost of equity? Assume that the earnings are stable.

Solution: Cost can be calculated using the Earning per share basis.

Earnings per share = [2, 00, 000 / 10, 000] = Rs 20

Market price = Rs 180 – 10 = Rs 170

$$Ke = \frac{20}{170} \times 100 = 11.76\%$$

Illustration 8: A company issues 5, 00, 000 equity shares of Rs 10 each and has earned a profit of Rs 6, 00, 000 after tax. If the market price of these shares is Rs 16 per share, the cost of capital will be,

$$Ke = \frac{1.20}{16} \times 100 = 7.5\%$$

$$EPS = \frac{6,00,000}{5,00,000} = 1.20$$

The method of computing cost of capital has the following limitations:

- Earnings per share cannot be assumed to be constant in the longer period of time.
- Market price per share does not remain stable because increase in retained earnings results in an increase in share price.

Illustration 9: A ltd has issued 2, 000 equity shares of Rs 100 each as fully paid. The company has earned a profit of Rs 20, 000 after tax. The market price of these shares is Rs 160 per share. On these shares, dividend has been paid at the rate of Rs 8 per share.

Find out the cost of equity capital using:

(a) Dividend Yield Method

(b) Earnings Yield Method

Solution:

(a) Dividend Yield Method:

$$Ke = \frac{DPS}{MP} \times 100 \quad = \frac{Rs\,8}{Rs\,160} \times 100 = 5\%$$

(b) Earning Yield Method:

$$Ke = \frac{Rs\,10}{Rs\,160} \times 100 = 6.25\%$$

3. Dividend yield plus growth in dividend yield method:

Although it is assumed that the present rate of dividend will remain constant in future also, the management estimates that the company's present dividend will increase continuously for the years to come, then an allowance for future growth in dividend is added to the current dividend yield. The growth rate in dividend is assumed to be equal to the growth rate in earnings per share. Symbolically,

$$Ke = \frac{DPS}{MP} \times 100 + g$$

Where, DPS = Dividend per share, MP = Market Price per share, Growth rate in dividend i.e. expected annual percentage rate of increase in future dividend.

Example: The current market price per share is Rs 110 and the current dividend per share is Rs 5.50, assuming that the dividends grow at the rate of 5%, calculate the cost of equity capital.

Solution:

$$Ke = \frac{5.50}{110} \times 100 + 0.05 = 10\%$$

This method of ascertaining cost of capital is considered as the best method, as it considers the practical aspects of the problem. It is claimed that it will give an accurate estimate of return. But it is true, only if the dividends and earnings grow at the same rate. The main difficulty is to determine the rate of growth expected by a shareholder due to uncertainty of future.

Illustration 10: Sun Ltd. has its hare of Rs 10 each quoted on the stock exchange; the current price per share is Rs 34. The gross dividend per share over the last four years has been Rs 1.20, Rs 1.32, Rs 1.45 and Rs 1.60. Calculate the cost of equity capital.

Solution:

$$Ke = \frac{DPS}{MP} \times 100 + g$$

Expected current year's dividend = D (1 + g)

= Rs 1.60 (1 + .10)

= 1.60 x 1.11 = Rs 1.76

The dividends are growing @ 10% and are expected to continue to grow at this rate.

$$Ke = \frac{1.76}{24} \times 100 + 0.00 = 17\%$$

4. Capital Asset Pricing Model (CAPM): The CAPM divides the cost of equity into two components – the risk free return available on investing in government securities and as additional premium for investing in a particular share or investment. This model recognizes that an investor's required rate of return is the compensation for time value of money and risk. As investors are

generally risk averse, they require a premium for taking risk. Hence, the cost of equity share capital can be computed as –

Ke = Rf + Bi [Rm – Rf]

Where, Ke = Cost of equity capital

Rf = Risk free rate of return

Bi = Beta of investment i.e. sensitivity of returns of a security i to changes in market risk.

Rm = Average return on Market portfolio

The risk free rate of return is earned by an asset with no risk, generally on govt. securities in India. And the market risk premium is the difference between the expected return on market and risk free rate of interest.

If the share has a risk different from the market risk, we need to adjust its premium to reflect this difference. The adjustment factor is represented by Bi (beta) of a security.

For example: if rf is 12% and Bi is 2 and return on market portfolio is 15%, the cost of equity capital as per CAPM will be,

Ke = Rf + Bi [Rm – Rf]

Ke = 12 + 2 [15 – 12] = 18%

Illustration 11: The beta co-efficient of ABC Ltd is 1.40. The risk free rate of return on Government securities is 7%. The expected rate of return on company's equity shares is 15%. Calculate the cost of equity capital based on CAPM.

Solution:

Ke = Rf + Bi [Rm – Rf]

Ke = 7 + 1.40 [15 – 7] = 18.2%

5.6.4 Cost of Internal equity or Retained Earnings

The retained earnings are the funds accumulated by a company over a period by keeping part of profits without distribution. It is a major source of finance mostly used for expansion and diversification programs. The cost of retained earnings is an opportunity cost to be measured in terms of income foregone by the shareholders that they could have earned by investing the dividends foregone in some alternative investments. Hence, the cost of retained earnings is equal to cost of equity. To the extent of personal tax rate and floatation costs, the costs of retained earnings will be cheaper. Thus, as per "Opportunity Cost Approach", Kr is calculated by any of the following formulae,

$$Kr = Ke[1-f][1-T]$$

Or

$$Kr = \frac{D[1-f][1-T]}{MP} \times 100$$

or

$$Kr = \frac{D}{MP} \times 100 + g \times [1 - f][1 - T]$$

Where, f= floatation costs and T = Personal Tax rate, g = growth rate in dividend,

MP = Market Price.

Illustration 12: Narendra Mart is currently earning a net profit of Rs 60, 000 p.a. the shareholder's required rate of return [Ke] is 15%. If earnings are distributed among the shareholders they can invest in securities of similar type carrying a return of 15% p.a. however, the shareholder's will have to incur 2% brokerage charges for making new investments. They are also in the 30% tax bracket. Compute the cost of retained earnings to the company.

Solution:

Kr = Ke [1 – f] [1 - T]

= 15% [1- 0.02] [1 – 0.30]

= 10.29%

Verification: Suppose the company's pay out Ratio is 100%.

Dividends payable to the shareholders	= Rs 60, 000
Less: Personal Income Tax	18, 000
After Tax Dividends	42, 000
Less: Brokerage @ 2% on Rs 42, 000	840
Net Amount available for investment	41, 160

Shareholders can earn at 15% on Rs 41, 160 – Rs 6174. This is the opportunity income foregone by shareholders if the company retains Rs 60, 000. Hence, the required rate of return for Rs 60, 000 is Rs 6174 and the rate of return is 10.29%. Hence, the required rate of return expected by the shareholders from the company is 10.29%, which is the cost of retained earnings.

Illustration 13: Find out the cost of retained earnings from the following data:

Dividend per share	Rs. 15
Personal income tax Rate	30%
Market price per share	Rs. 110
Brokerage on investment of dividend	1%

Solution:

$$Kr = \frac{D[1 - f][1 - T]}{MP} \times 100$$

$$= \frac{15 \times [1 - 0.01][1 - 0.30]}{110} \times 100$$

$$= \frac{15 \times 0.99 \times 0.70}{110} \times 100 = 9.45\%$$

5.6 Weighted Average Cost of Capital [WACC]

WACC is defined as the weighted average of the cost of various sources of finance, weight being the proportion of each source to the total pool of capital structure. It is also called composite cost of capital. It may be simple average or weighted average. Simple average is calculated by assigning equal weights to all sources of funds whereas weighted average is computed by assigning different weights to different sources of funds. The capital raised from various sources is invested in different projects. The profitability of these projects is evaluated by comparing the expected rate of return with composite cost of capital i.e. WACC. Thus, Weighted Average Cost of Capital, is an average of the costs of specific sources of capital employed in a business properly weighted by the proportion they held in the firm's capital structure.

Calculating WACC –

Its computation involves the following steps:

1. **Assignment of Weights**: firstly, weights have to be assigned to each source of capital for calculating the weighted Average Cost of Capital. Weights can be either "book value weights" or "market value weights".

   a. Book value weights – relative proportion of various sources of capital to the capital structure of a firm and can be calculated by taking information from balance sheet of the firm.

   b. Market Value Weights – is the market value of different sources of capital. It can be calculated by knowing the current market price of each security in each category. However, the market value weights are more appealing as they are better indicators of firm's cost of capital.

2. **Computation of specific cost of each source**: now, specific costs of each source of capital are to be calculated. In financing decisions, all costs used are "after tax" costs.

3. **Computation of WACC**: the computed weighted costs of all sources of funds are added to obtain an overall weighted average cost of capital.

   The formula for computation of WACC is –

   Ko = WdKd + WpKp + weKe + WrKr

   Where,

   Ko = weighted average cost of capital

Wd, Wp, We and Wr = Weights assigned to debt, preference share capital, equity capital and retained earnings.

Kd, Kp, Ke and Kr = Cost of debt, preference share capital, equity capital and retained earnings

Illustration 14: Shantanu Ltd has hte following capital structure:

Particulars	Market Value	Book Value	Cost
Equity Capital	80	120	18
Preference Capital	30	20	15
Secured Debt	40	40	14

Cost of individual sources of capital is net of tax. Compute the company's weighted average cost of capital.

Solution:

WACC based on Market Value:

WACC of the company based market value = 16.33%

WACC based on Book Value :

Capital Source	Market value [Rs in lakhs] [a]	Weight % [b]	Cost [net of tax] % [c]	Weighted cost of capital [b] x [c]
Equity Capital	120	6/9 = 66.67	18	12.00
Preference Capital	20	1/9 = 11.11	15	1.67
Secured Debt	40	2/9 = 22.22	14	3.11
Total	180	1 = 100		16.78

WACC of the company based market values = 16.78%

Illustration 15: Calculate the weighted average cost of capital from the following information:

a. Capital Structure of Y Ltd: (Rs)

Equity capital: Shares of Rs 10 each fully paid	1, 00, 000
Reserves (General)	50, 000
Long Term Debt	1, 00, 000

b. Market price per share of AB Ltd is Rs 60 and earning per share is Rs 6. The expected growth rate earnings are 5% p.a.

c. Cost of debt (before tax) = 12% p.a

d. Applicable corporate tax = 40%

e. Use market values as weights and show your workings.

Solution :

(a) Cost of equity (using Earnings Growth method)

$$Ke = \frac{E+g}{P} = \frac{Rs\,6+0.05}{Rs\,60} = 0.1+0.05 = 0.15 or\ 15\%$$

(b) Cost of Reserves (using external yield criterion)

Kr = Ke = 15%

(c) Cost of Long term debt

Kd = r(1-t) = 0.12 (1-0.4) = 0.072 or 7.2 %

Weights: Market value of Equity and General Reserve = 60 x 10, 000 = 6, 00, 000

Divided in the ratio 2:1, we get,

$$\text{Market value of Equity} = 6{,}00{,}000 \times \frac{2}{3} = Rs.\,4{,}00{,}000$$

$$\text{Market value of Reserves} = 6{,}00{,}000 \times \frac{1}{3} = Rs\,2{,}00{,}000$$

Statement of WACC

Capital Source	Market value [Rs in lakhs] [a]	Weight % [b]	Cost [net of tax] % [c]	Weighted cost of capital [b] x [c]
Equity Capital	4, 00, 000	0.57	15	8.55
Reserves	2, 00, 000	0.29	15	4.35
Long Term Loan	1, 00, 000	0.14	7.2	1.01
Total	7, 00, 000	1.00		13.91

Merits of WACC

This approach is widely used in determining the required return on a firm's investments. It offers a number of advantages including the following:

- It employs a direct and reasonable methodology and is easily calculated and understood. Hence, it is a straightforward and logical approach.
- It is responsive to changing conditions as small changes in the capital structure will be noted in the overall cost of capital of the firm
- During the period of normal profits, it is proved more accurate as a cut-off rate in selecting capital budgeting proposals.
- It has proved as an ideal criterion for selecting capital expenditure proposals by providing a cut-off rate that determines the lower limit for accepting an investment proposal.

Limitations of WACC

This approach has some weaknesses. Some of them are:

- Inclusion of short term loans in the calculation of cost of capital will result in low weighted average cost. Hence, unsuitable in case of low cost debt.
- If a firm is experiencing low profits, weighted average cost will be inaccurate and of limited value.
- The main difficulty is to assign weights to different components of capital structure.
- The selection of capital structure to be used for determining the weighted average cost of capital is not an easy task.

5.8 Summary

The Cost of Capital of a company is the average rate of return required by the investors who provide long term funds.Strictly speaking the cost of capital of a firm is an appropriate discount rate for a project that is a carbon copy of the firm's existing business. However, in practice, the cost of capital is used as a benchmark hurdle rate that is adjusted for variations in risk and financing patterns. There are different types of cost of capital namely (1) Future Cost & Historical Cost, (2) Specific Cost & Combined Cost, (3) Explicit Cost & Implicit Cost, (4) Average Cost & Marginal Cost. The Concept of Cost of Capital helps the company's management in designing the optimum capital structure for the firm, taking Capital Budgeting Decisions, in making a comparative study of different sources of financing, in the evaluation of financial performance of top management and taking financing and dividend decisions.

The cost of a specific source of finance is measured as a rate of discount that equates the present value of the expected post-tax payments to that source of finance with the net funds received from that source of finance.Since there are no fixed contractual payments on equity stock. As there are no other securities, it is not easy to estimate the cost of equity. Several methods have been suggested to figure out the return expected by equity shareholders: (1) Dividend Yield Method, (2) Earnings – Price Ratio Method, (3) Dividend yield plus growth in dividend yield method, (4)Capital Asset Pricing Model. As none of these methods is perfect, you may have top use more than one method to get a reasonable handle on the cost of equity. For calculating the Weighted Average Cost of Capital, you have to multiply the cost of each source of finance with its respective weights. The weights may be based on (1) Book Value, (2) Market Values. We recommend the use of market value weights unless market values are not available or highly unreliable or distorted.

5.8 Key Words

- **Cost of Capital:** the cost of capital is the measurement of the sacrifice made by him in order to invest to get a fair return in future on his investments as a reward for the postponement of present needs. It is the price paid to the investor for the use of capital provided by him.
- **Explicit Costs: It** is the internal rate of return which a firm pays for procuring finances.
- **Implicit Costs: It** is the rate of return associated with the best investment opportunity for the firm which will be sacrificed if the present investment proposal is accepted. Hence it is an opportunity cost.
- **Future Costs:** Future Cost is an expected cost of funds which may be incurred for raising funds in future. They are relevant costs for financial decision making.
- **Historical Costs:** Historical Costs are expired costs which are already incurred for financing an investment proposal.

- **Cost of Equity Capital:** It may be defined as the minimum rate of return that a firm must earn on the equity financed portion of an investment in order to leave the unchanged market price of its shares.
- **Cost of Debt:** the cost of debt can be defined in the terms of the required rate of return that the debt financed investment must yield to prevent damage to the shareholders position.
- **Cost of Retained earnings:** The cost of retained earnings is an opportunity cost to be measured in terms of income foregone by the shareholders that they could have earned by investing the dividends foregone in some alternative investments.
- **Capital Asset Pricing Model (CAPM):** This model recognizes that an investor's required rate of return is the compensation for time value of money and risk.
- **Weighted Average Cost of Capital:** WACC is defined as the weighted average of the cost of various sources of finance, weight being the proportion of each source to the total pool of capital structure. It is also called composite cost of capital.

5.9 Self Assessment Test

1. Define the concept of 'Cost of Capital'. State how you would determine the weighted average cost of capital of the firm.
2. What is meant by Cost of Capital of a firm and what relevance does it have in decision making? How is it calculated with different types of sources of capital funds?
3. Explain the concept of Cost of Capital as a basis for corporate investment and financial decisions. Also explain different types of costs.
4. The current market price of the shares of A Ltd is Rs. 95. The floatation costs are Rs. 5 per share. Dividend per share amounts to Rs. 4.50 and is expected to grow at a rate of 7%. You are required to calculate the cost of equity share capital. 12%)
5. ABC Ltd. Has the following capital structure

Equity (expected dividend 12%)	Rs. 10, 00, 000
10% Preference	Rs. 5, 00, 000
8% Loan	Rs. 15, 00, 000

Calculate the company's weighted average cost of capital, assuming 50% as the arte of income tax, before and after tax.

UNIT - 6 : MODIGLIANI AND MILLER (MM) THEORY

Unit Structure

6.0 Objectives

After studying this unit, you should be able to understand:

- The Theory of MM
- Its assumptions
- Its proof of argument
- Its criticism

6.1 Introduction

Modigliani and Miller in their paper have stated that the relationship between everage and the cost of capital is explained by the net operating income approach in terms of three basic propositions. They argue against the traditional approach by offering behavioral justification for having the cost of capital, k_o, remain constant throughout all degrees of leverage.

According to this approach, the value of the firm and its cost of capital independent of its capital structure, i.e., the total value of the firm remain unchanged inspite of the debt equity mix or the degree of leverage. In other words, a change in the debt equity mix does not affect the cost of capital. It argues that the overall cost of capital is the weighted average of cost debt capital, and cost of equity capital. Cost of equity capital depend upon shareholders expectations. Now, if shareholders expect 10% from a certain company they have already taken into consideration the debt equity ratio in the capital structure and they find 10% to cover the particular risk which the firm entails.

6.2 Assumptions

Modigliani and Miller approach is based upon the following assumptions:-

1. There are no corporate taxes.
2. There is a perfect market.
3. Investors act rationally.
4. The expected earnings of all the firms have identical risk characteristics.
5. The cut-off point of investment in a firm is capitalisation rate.
6. Risk to investors depends upon the random fluctuations of expected earnings and the possibility

that the actual value of the variables may turn out to be different from their best estimates.

7. All earnings are distributed to the shareholders.

6.3 Basic Propositions

MM derived the following three propositions based on the above assumptions.

Proposition I: The total market value of the firm which is equal to the total MV of debt and market value of equity is independent of the degree of leverage and is equal to its expected operating incomes discounted at the rate appropriate to its risk class.

Symbolically, it is represented :

$V_j = S_j + B_j = O_j / P_k$

V_j = total market value of the firm j

S_j = market value of the equity of the firm j

B_j = market value of the debt of the firm j

O_j=expected operating income of the firm j

P_k = discount rate applicable to the risk class k to which the firmj belongs.

Proposition II: The expected yield on equity, i, is equal to Pk plus a premium which is equal to the debt-equity ratio times the difference between k and the yield on debt, r.

Symbolically it is represented as

$Ij = pk + (pk - r)\ Bj/Sj$

Proposition III: The manner in which an investment is financed does not affect the cut-off rate for the investment decision-making for a firm in a given risk class. The proposition emphasizes the point that average cost of capital is not affected by the financing decisions as both investment and financing decisions are independent.

6.4 Proof of MM Argument

The value of a firm depends on its profitability and risks. It is in variant with respect to relative changes in the firm's capitalization. Similarly, according to the theory, cost of capital and market value of the firm must be same regardless of the degree of leverage.

The operational justification for the MM hypothesis is the "Arbitrage Argument". The term arbitrage refers to the act of buying a security in the market, where the price is less and simultaneously selling it in another market where the price is more, to take advantage of the difference in price prevailing in two different markets. Arbitrage process helps to bring equilibrium in the market. Because of arbitrage, a security cannot be sold at different prices in different market. MM approach illustrates the arbitrage process with reference to valuation in term of two firms, which are exactly similar in all aspects with respect to leverage, so that one of them has debt in the capital structure while other does not. Such homogenous firm's are, according to MM, perfect substitutes. If the market value of the two firms which are exactly game in all the respects, except with the leverage, which is not equal, investors of the overvalued arm would sell their shares, borrow additional funds on their personal account and invest in the undervalued firm, in order to obtain the investors for arbitrage is termed as home-made or personal leverage. So investor undertaking arbitrage would be better off. This behaviour of arbitrage will have investors of overvalued firm. Arbitrage would be counting till the market prices of two identical firms become identical.

Illustration-1

The operation of arbitrage process is illustrated below.

Assume that there are two firms L and U which are identical in all the respects except that, the farm L has 10% Rs. 5,00,000 debentures. The EBIT of both the firms are Rs. 80,000. The cost of equity of the firm L is higher at 16% and firm U is lower at 12.5%. The total market values of the firm are computed as below

	FIRM- L	FIRM- U
EBIT	80 000	80 000
Less:Interest	50,000	
Earnings available to ESH (ND	30,000	80,000
Cost of equity (K,)	0.16	0.125
Market value of equity shares	1,87,500	6,40,000
Market value of debt	5,00,000	
Total value of the firm	6,87,500	6,40,000

* Thus, the total value of the firm which employed debt is more than the value of the other firm. According to MM, this previous arbitrage would start and continue till the equilibrium is restored.

WORKING OF THE ARBITRAGE PROCESS

Suppose there is an investor X, who holds 10% of the outstanding shares in the firm L. This means his holding amounts to Rs. 18,750 and his shares in the earning which belongs to equity shareholders is Rs. 3000 (10% of Rs. 30,000). Mr. X will sell his holding in the firm L and invest money in the firm U. The firm U has no debt in the capital structure and hence, the financial risk to Mr. X would be less in the firm U than firm L. In order to have the same degree of financial risk as of the firm U, Mr. X will borrow additional funds equal to his proportionate shares in substituted personal leverage in place of corporate leverage.

The position of Mr.X is summarized as below. **Firm -** L

Investment amount *(10% holding)* *18,750*

Dividend incon1C *(10% of 30000)* *3,000*

3000 =16%

Return on funds *18,750*

Firm- U

Investment amount (18,750+50,000) = *68,750*
(50,000 borrowed at 10%)

$Total\ Income = \frac{68750}{640000}$ x 80000= 8593.75 = *8,593.75*

Less: Interest on loan *5,000*

Return on investment

$ROI = \frac{3593.75}{18750} = 19.16\%$

So Mr. X gets a higher income after shifting his investment to company U (Rs 3,000 and 3,593.75) His ROI increases from 16% to 19%. The other investors will also wish to make profit out of arbitrage. This increases the demand for securities of the firm U and will lead to increase in its price. At the same time, the price of the security of the firm L will decline due to the selling pressure. This will continue till the prices of the securities of the firms become identical.

Taxes: If the corporate taxes are taken into consideration. MM argues that the value of the firm will increase and cost of capital will decrease with leverage. Interest paid on the debt is tax deductible and therefore, effective cost of debt is less than the coupon rate of interest. Therefore, levered firm would have a greater market value than the unlevered firm (cost capital of levered firm would be lower).

Symbolically:
VL= VU+BT
VI, = Value of levered firm
V_u= Value of unlevered firm
B= Amount of debt
T = Tax rate

6.5 Criticisms of MM Proposition

TAXATION AND CAPITAL STRUCTURE

The irrelevance of capital structure rests on the absence of market imperfections. Though debt and equity are two different parts there is something called conservation of value, wherein the sum of parts is always the same. However, in the face of imperfections in the capital markets, the capital structure of a firm may affect the valuation i.e. the firm's valuations and cost of capital may change with changes in its capital structure.

CORPORATE TAXES

Presence of taxes is one of the major imperfections. Debt Financing is advantageous when taxes are applicable to corporate income. The reason is that the dividends and retained earnings are not deductible for tax purposes, whereas interest on debt is a tax-deductible expense. Hence, the combined income of stockholders and debtholders is greater when debt capital is used.

Illustration -2

Consider two firms A and B having an expected net operating income of Rs.5,00,000 which are similar in all respects except in the degree of leverage employed by them. Firm A employs no debt capital whereas firm B has Rs.20,00,000 in debt capital on which it pays 12 percent interest. The corporate tax rate applicable to both the firms is 50%. The income to stockholders and debtholders of both the firms is shown below.

	Rs.	Rs.
crating Income	*5,00,000*	*5,00,000*
Interest on Debt	-	*2,40,000*
Profit before Taxes,	*5,00,000*	*2,60,000*
Taxes	*2,50,000*	*1,30,000*
Profit after Tax (Income available to	*2,50,000*	*1,30,000*
Combined Income of Debtholders and	*2,50,000*	*3,70,000*

It is quite clear from the above table that the combined income of debtholders and stockholders of the levered fir B is higher than that of the unlevered of A.

The explanation for this is: the interest payment of Rs. 240,000 made by the levered firm brings a tax shield of Rs. 1,20,000 (Rs 2,40,000 x Tax rate). Therefore, the combined income of the debtholders and stock holders of firm B is higher by this amount.

The present value of tax shield associated with interest payments, assuming debt to be perpetual in nature would be equal to

$$\text{Present value of tax shield} = = \frac{t_c B_r}{r} = t_c B$$

where,

t_c =corporate tax rate

B = market value of debt

r=interest rate on debt

In the above Illustration, for firm B, the present value of tax shield works out to: 0.5(20,00,000) = Rs.10,00,000 which represents the increase in market value arising from financial leverage.

In general, when corporate taxes are considered the value of the firm that is levered would be equal to the value of the unlevered firm increased by the tax shield associated with debt, i.e.

$$V = \frac{O(1-t_c)B_r}{k} + t_c B$$

From the above equation it is quite clear that other things being equal, greater the leverage, greater is the value of the firm. This implies that the optimal strategy of a firm should be to maximize the degree of leverage in its capital structure.

Corporate Taxes and Personal Taxes

When personal taxes are considered along with corporate taxes and investors pay the same rate of personal taxes on debt returns as well as stock returns, the advantage of corporate tax in favor of debt capital remains intact.

Consider a 30% personal tax rate to debt as well as stock returns in the above Illustration. The income to debtholders and stockholders after taxes, both corporate and personal is calculated below:

	Firm A	Firm B
Income available to stockholders	250000	130000
Less : Personal taxes at 30%	75000	39000
Income available to stockholders after personal tax	175000	91000
Income to debtholders	0	240000
Less : Personal taxes at 30%	-	472000
Income to debtholders after personal taxes	0	168000
Combined income of stockholders and debtholders after taxes	175000	259000

From the above table, it is clear that although the combined post tax stockholders and debtholders decreases in both the firms, the proportional advantage of debt remains unaffected because the combined income of stockholders and debtholders is still higher by 48% in the levered firm.

If the personal tax rate is $_b$ the tax advantage of debt becomes: $t_c B(1-t_p)$.

The above formula is valid when personal tax rate applicable to stock as well as debt income is same as in the above Illustration. However, it is not the same in many countries including India. Stock income, which includes dividend income and capital gains is taxed at a lower rate when compared to that of debt-income. (t_{pd}) the tax advantage of debt capital may be expressed as :

$$\left[1-\frac{(1-t_c)(1-t_{ps})}{(1-t_{pd})}\right]xB$$

tc = corporate tax rate

tpd= personal tax rate on debt on income

tps= personal tax rate on equity on income

Bankruptcy Costs

Existence of bankruptcy costs is another important imperfection affecting the capital structure. Capital Market when perfect, has no costs associated with bankruptcy. Assets of a bankrupt tinn can be sold at their economic values and legal and administrative expenses are not present. However, in the real world, there are costs associated with bankruptcy. Under distress conditions, assets are sold at a significant discount below their economic values. Moreover, costs like legal and administrative costs associated with bankruptcy proceedings are high. Finally, an impending bankruptcy entails significant costs in the form of sharply impaired operational efficiency.

The probability of bankruptcy for a levered firm is higher than for an unlevered firm, other things being equal. Beyond a threshold level, the probability of bankruptcy increases at an increasing rate as the debt-equity ratio increases. This means that the expected cost of bankruptcy increases when the debt-equity ratio increases. Investors expect a higher rate of return from a firm which is faced with the prospect of bankruptcy, as bankruptcy costs represent a loss that cannot be diversified away. The following figure is a graphical representation of the relationship between the required rate of return on equity, ke, and the leverage ratio, B/S.

Agency Costs

Whenever creditors are approached by a firm to obtain debt capital, they impose certain restrictions on the firm in the form of some protective covenants incorporated in the loan contract. They could be in the form of obtaining prior approval of the creditors for matters relating to key managerial appointments, maintenance of current ratio above a certain level, restriction on the rate of dividend during the currency of the loan, constraints on the additional issue of capital, limitation on further investments etc.

The above said restrictions generally entail legal and enforcement costs which also impair the operating efficiency of the firm. All these costs referred to as monitoring costs or agency costs, detract from the value of the firm.

Monitoring costs are a function of the level of debt in the capital structure. When the amount of debt is considerably less, then the creditors may limit their monitoring activity. But if the level of debt is high, then they may insist on continuous monitoring which entails substantial costs.

6.6 Self Assignment Test

1. State the Principal propositions of the Modigliani and Miller (MM) position.
2. Prove the MM hypothesis with the help of the arbitrage mechanism.
3. Illustrate the arbitrage mechanism suggested by MM with the help of a suitable numerical example.

6.7 Reference Books

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UNIT - 7 : ANALYSIS OF EBIT AND EPS

Unit Structure

7.0 Objectives

After studying this unit, you should be able to understand :

- The objectives of EBIT-EPS Analysis
- How to calculate EPS
- Analysis of EBIT-EPS through chart
- Indifference point determined mathematically
- Limitations of EBIT-EPS Analysis

7.1 Introduction

The financing decisions have two components. First, to decide as to how much total funds are needed, and second, to decide the sources or their combinations to raise such funds. The total quantity of funds needed, however, depends upon the investment decisions of the firm. Even though the firm is having estimation of required capital funds, then the problem then remains one of determining the best mix of different sources to be used in raising the required funds. The process that leads to the final choice of the capital structure is refered to as the capital structure planning. A firm may use several techniques available to quantify the risk return characterstics of the alternative capital structures. One of the widely used technique is EBIT-EPS Analysis.

It is a way to analyse the impact of leverage on the returns available to the shareholders. The EBIT-EPS analysis is one of the important tools in the hands of financial manager to get an insight into the firm's capital structure. He can consider possible fluctuations in EBIT and examine their impact on EPS under different financial plans. If the probability of earning a rate of return on firm's assets is more than the cost of debt, a large amount of debt can be used by the firm in its capital structure to increase the EPS. This may have a favourable effect on the market value per share. On the other hand, if the probability of earning a rate of return on firm's assets is less than the cost of debt, the firm should refrain from employing debt. Thus, the greater the level of EBIT and lower the probability of downward fluctuations, the more beneficial it is to employ debt in the capital structure of a firm.

7.2 Calculation of EPS

To understand EBIT-EPS break-even analysis of financial everage we take an illustration of ABC company.

Illustration 1 : ABC comapny is a long term financing company of $ 10 million of common stock equity. Company wishes to raise its capital by $ 5 million. It has three possible financing plans to raise its capital. The company may gain additional financing with a new issue of (1) all common stock, (2) all debt at 12 percent interest or (3) all preferred stock with an 11 percent dividend. Present annual earnings before interest and taxes (EBIT) are $1.5 million but with expansion are expected to rise to $2.7 million. The income tax rate is 40 percent, and 200,000 shares or common stock are now outstanding. Common stock can be sold at $50 per share under the first financing option, which translates into 100,000 additional shares of stock.

To determine the EBIT-EPS break-even, or indifference, points among the various financing alternatives, we begin by calculating earnings per share, (EPS), for some hypothetical level of EBIT using the following formula :

$$EPS = \frac{(EBIT - I)(1 - T) - PD}{NS} \qquad \text{eq (1)}$$

where I = annual interest paid
PD = annual preferred dividend paid
t = corporate tax rate
NS = number of shares of common stock outstanding

Suppose we wish to know what earnings per share would be under the three alternative additional-financing plans if EBIT were $2.7 million. The calculation are shown in Table 8.1. Note that interest on debt is deducted before taxes, while preferred stock dividends are deducted after taxes. As a result, earnings available to common share-holders (EACS) are higher under the debt alternative than they are under the preferred stock alternative, despite the fact that the interest rate on debt is higher than the preferred stock dividend rate.

Calculation of EPS under three Additional-Financing Alternatives

Table 7.1

	COMMON STOCK	DEBT	PREFERRED STOCK
Earnings before interest and taxes (*EBIT*)	$2,700,000	$2,700,000	$2,700,000
Interest (*I*)	—	600,000	—
Earnings before taxes (*EBT*)	$2,700,000	$2,100,000	$2,700,000
Income taxes [(*EBT*) × (*t*)]	1,080,000	840,000	1,080,000
Earnings after taxes (*EAT*)	$1,620,000	$1,260,000	$1,620,000
Preferred stock dividends (*PD*)	—	—	550,000
Earnings available to common shareholders (*EACS*)	$1,620,000	$1,260,000	$1,070,000
Number of shares of common stock outstanding (*NS*)	300,000	200,000	200,000
Earnings per share (EPS)	**$5.40**	**$6.30**	**$5.35**

Illustration 2

Tushar Limited has a paid-up share capital of Rs. 10,00,000 divided into equity shares of Rs. 10 each. It requires further funds amounting to Rs 5,00,000 to finance its expansion programme. Following are the alternatives under consideration :

(i) Issue of 10% debentures of Rs. 5,00,000

(ii) Issue of 50,000 13% preference shares of Rs. 10 each

(iii) Issue of 50,000 equite shares of Rs. 10 each.

The company's earnings before interest and tax (EBIT) are Rs. 4,00,000 per annum. You are required to calculate the effect of each of the above alternatives on EPS presuming :

(a) EBIT continues to be same after ezpansion.

(b) EBIT increases by Rs.1,00,000.

Solution:

(a) When EBIT is Rs. 4,00,000 p.a.

Particulars	**Present Capital Structure** (All Equity)	**Proposed Capital Structure** (Enquity + Debt)	(Enquity + Preference)	(All Equity
	Rs.	Rs.	Rs.	Rs.
EBIT	4,00,000	4,00,000	4,00,000	4,00,000
Less : Interest	-	50,000	-	-
Profit Before Tax (PBT)	4,00,000	3,50,000	4,00,000	4,00,000
Less : Tax	2,00,000	1,75,000	2,00,000	2,00,000
Profit AfterTax (PAT)	2,00,000	1,75,000	2,00,000	2,00,000

Profit AfterTax (PAT)	2,00,000	1,75,000	2,00,000	2,00,000
Less : Preference dividend	-	-	65,000	-
Profit avialable for equity Shareholders	2,00,000	1,75,000	1,35,000	2,00,000
No. of equity shares	1,00,000	1,00,000	1,00,000	1,50,000
EPS (Rs.)	2	1.75	1.35	1.33
Dilution against initial EPS of Rs.	_	-0.25	-0.65	0.67

Interpretation : It is clear from the above table that minimum decrease in EPS is under alternative (i), i.e., when complete additional amount is raised through debt. Therefore, it is advisable to raise additional funds through issue of debentures.

(b) When EBIT is Rs. 5,00,000 p.a.

Particulars	**Present Capital Structure**	**Proposed Capital Structure**		
	(All Equity) Rs.	(Enquity + Debt) Rs.	(Enquity + Preference) Rs.	(All Equity Rs.
EBIT	4,00,000	5,00,000	500,000	5,00,000
Less : Interest	-	50,000	-	-
Profit Before Tax (PBT)	4,00,000	4,50,000	5,00,000	5,00,000
Less : Tax	2,00,000	2,25,000	2,50,000	2,50,000
Profit AfterTax (PAT)	2,00,000	2,25,000	2,50,000	2,50,000
Less : Preference dividend	-	-	65,000	-
Profit avialable for equity Shareholders	2,00,000	2,25,000	1,85,000	2,50,000
No. of equity shares	1,00,000	1,00,000	1,00,000	1,50,000
EPS (Rs.)	2	2.25	1.85	1.67
Dilution against initial EPS of Rs.	_	+0.25	-0.15	-0.33

Interpretation : It is clear that EPS registered an increase over the present capital structure when complete additional funds are raised through issue of debt. Hence, Alternative (i) is preferable.

7.3 EBIT - EPS Chart

With the given information in Table 8.1, we can construct an *EBIT-EPS break even chart*. On the horizontal axis we plot earnings before interest and taxes, and on the vertical axis we plot earnings per share.

For each financing alternative, we will draw a straight line to reflect EPS for all possible levels of EBIT. Becuase two points determine a straight line, we need two data points for each financing alternative. The first is the EPS calculated for some hypothetical level of EBIT. For the expected $2.7 million level of EBIT, we see in Table 8.1 that earnings per share are $5.40, $6.30, and $5.35 for the common stock, debt, and preferred stock financing alternatives. We simply plot these earnings per share levels to correspond with the $2.7 million level of EBIT. Technically, it does not matter which hypothetical level of EBIT we choose for calculating EPS.

The second data point - choosen chiefly because of its ease of calculation- is where EPS is zero. This is simply the EBIT necessary to cover all fixed financial costs for a particular financing plan, and it is plotted on the horizontal axis.

We can make use of eq. (1) to determine the horizontal axis intercept under each alternative. We simply set the numerator in the equation equal to zero and solve for *EBIT*. For the common stock alternative we have

$$0 = (EBIT - I)(1 - t) - PD \qquad \text{eq (2)}$$

$$= (EBIT - 0)(1 - .40) - 0$$

$$= (EBIT)(.60)$$

$$EBIT = 0/(.60) = 0$$

Notice there are no fixed financing costs whatsoever (either on old or new financing). Therefore, EPS equals zero at zero EBIT. For the debt alternative we have

$$0 = (EBIT - I)(1 - t) - PD$$

$$= (EBIT - \$600{,}000)(1 - .40) - 0$$

$$= (EBIT)(.60) - \$360{,}000$$

$$EBIT = \$360{,}000/(.60) = \mathbf{\$600{,}000}$$

Thus, the after-tax interest charge divided by 1 minus the tax rate gives us the EBIT necessary to cover these interest payments. In short, we must have $600,000 to cover interest charges, so $600,000 becomes the horizontal axis inntercept. Finally, for the preferred stock alternative we have

$$0 = (EBIT - I)(1 - t) - PD$$

$$= (EBIT - 0)(1 - .40) - \$550{,}000$$

$$= (EBIT)(.60) - \$550{,}000$$

$$EBIT = \$550{,}000/(.60) = \mathbf{\$916{,}667}$$

We divide total annual preferred dividends by 1 minus the tax rate to obtain the EBIT necessary to cover these dividends. Thus, we need $916,667 in EBIT to cover $550,000 in preferred stock dividends, assuming a 40 percent tax rate. Again, preferred dividends are deducated after taxes, so it takes more in before tax earnings to cover them than it does to cover interest. Given the horizontal axis intercepts and earnings per straight line through each set of data points. The break-even, or indifference, chart for ABC Company is shown in Figure 7.1.

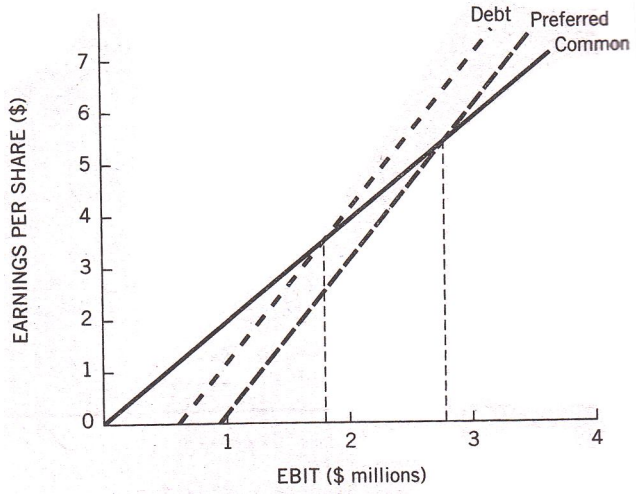


Figure 7.1 EBIT-EPS Indifference chart for three Additional-Financing Alternatives

We see from Figure 7.1 that the earnings per share indifference point between the debt and common stock additional financing alternatives is $1.8 million in EBIT. If EBIT is below that point, the common stock alternative will provide higher earnings per share. Above that point the debt alternative produces higher earnings per share. The indifference point between preffered stock and the common stock alternative is $2.75 million in EBIT. Above that point, the preferred stock alternative produces more favorale earnings per share. Below that point, the common stock alternative leads to higher earnings per share. Note that there is no indifference point between the debt and preferred stock alternatives. The debt alternative dominates for all levels of EBIT and by a constant amount of earnings per share, namely 95 cents.

7.4 Indifference Point Determined Mathematically

The indifference point between two alternative financing methods can be determined mathematically by first using equestion (1) to express *EPS* for each alternative and then setting these expression equal to each other as follows :

$$\frac{(EBIT_{1,2} - I_1)(1-t) - PD_1}{NS_1} = \frac{(EBIT_{1,2} - I_2)(1-t) - PD_2}{NS_2} \qquad \text{eq (3)}$$

where $EBIT_{1,2}$ = EBIT indifference point between the two alternative financing methods that we are concerned with - in this case, methods 1 and 2

I_1, I_2 = annual interest paid under financing methods 1 and 2

PD_1, PD_2 = annual preferred stock dividend paid under financing methods 1 and 2

t = corporate tax rate

NS_1, NS_2 = number of shares of common stock to be outstanding under financing methods 1 and 2

Suppose that we wish to determine the indefference point between the common stock and debt-financing alternatives in our example. We would have

Common Stock *Debt*

$$\frac{(EBIT_{1,2} - 0)(1-.40)0}{300{,}000} = \frac{(EBIT_{1,2} - \$600{,}000)(1-.40)0}{200{,}000}$$

Cross multiplying and rearranging, we obtain

$$(EBIT_{1,2})(.60)(200{,}000) = (EBIT_{1,2})(.60)(300{,}000) - (.60)(\$600{,}000)\ (300{,}000)$$

$$(EBIT_{1,2})(60{,}000) = \$108{,}000{,}000{,}000$$

$$EBIT_{1,2} = \mathbf{\$1{,}800{,}000}$$

The EBIT-EPS indifference point, where earnings per share for the two methods of financing are the same, is $1.8 million. This amount can be verified graphically in Figure 8.1. Thus, indifference points can be determined both graphically and mathematically.

7.5 Limitations of EBIT and EPS analysis

If maximization of the EPS is the only criterian for selecting the particular debt-equity mix, then that capital structure which is expected to result in the highest EPS will always be selected by all the firms. However, achieving the highest EPS can not be the only goal of any firm. The main limitations of the EBIT-EPS analysis are as follows :

(i) The EPS Criterian ignore the Risk Aspect : The EBIT-EPS analysis ignores as to what is the effect of leverage on the overall risk of the firm. With every increase in financial leverage, the risk of firm and risk for the investors abo increases. This analysis fails to deal with the variability of EPS and the risk return trade off.

(ii) EPS is Useful for Measuring Performance : The EPS basically, depends upon the operating profit which in turn, depends upon the operating efficiency of the firm. It is a resultant figure and it is more a measure of performance rather than a measure of decision making.

7.6 Summary

EBIT-EPS break-even, or indifference, analysis is used to study the effect of financing alternatives on earnings per share. The break-even point is the EBIT level where EPS is the same for two (or more) alternatives. The higher the expected level of EBIT, assuming that it exceeds the indifference point, the stronger the case that can be made for debt financing, all other things the same. The relationship between *EBIT* and *EPS* is :

$$EPS = \frac{(EBIT - I)(1 - t) - PD}{n}$$

The *EBIT* indifference point between two alternative financing plans can be obtained by solving the following equation for *EBIT* :

$$\frac{(EBIT_{1,2} - I_1)(1 - t) - PD_1}{NS_1} = \frac{(EBIT_{1,2} - I_2)(1 - t) - PD_2}{NS_2}$$

7.7 Key Words

- **EBIT -** Earnings Before Interest and Taxes. Accountants like to use the term Net Operating Income. It is the income that the company has before subtracting interest and taxes.
- **EPS -** This is the amount of income that the common stock holders entitled to receive (per share of stock owned). This income may be paid out in the form of dividends, retained and reinvested by the company, or a combination of both.
- **EBIT-EPS Break - Even analysis** - Analysis of the effect of financing atternatives on earnings per share. The break even point is the EBIT level where EPS is the same for two (or more) alternatives.
- **Leverage -** Results from the use of fixed cost assets or funds to magnify returns to the firms owners.
- **Financial Leverage -** The potential use of fixed financial costs to magnify the effects of changes in earnings before interest and taxes on the firms earnings per share.

7.8 Self Assessment Test

1. Discuss the relationship between *EBIT* and *EPS*.
2. Examine the effect of change in *EBIT* of a firm on the *EPS* under different capital structure.
3. What is indifference level of EBIT? Show graphically.
4. A company's present capital structure contains 1,500,000 equity shares and 50,000 preference shares. The firm's current EBIT is Rs. 7.2 million. Preference shares carry a dividend of Rs. 12 per share. The earnings per share is Rs. 2. The firm is planning to raise Rs. 10 million of external financing. Two financing alternatives are being considered : (i) issuing 1,000,000 equity shares for Rs. 10 each, (ii) issuing debentures for Rs 10 million carrying 15 percent interest.

   You are required to

   (a) Compute the EPS-EBIT indifference point.

   (b) Define the alternative which maximises EPS for various levels of EBIT.

UNIT - 8 : COST-VOLUME-PROFIT ANALYSIS

Unit Structure

8.0 Objectives

After studying this unit, you should be able to understand:

- The concept of Cost-Volume-Profit Analysis/B.E.P. Analysis.
- The relation between costs, volumes and profit.
- The significance of CVP Analysis.
- Advantages of CVP Analysis.
- Limitations of the CVP analysis.

8.1 Introduction

The risk and level of a firm's profit have a vital role in its value. Therefore, the financial manager should understand how the firm's cost structure affects the risk and level of its profit. In all organizations, variables factors that contribute to profit planning decisions are cost, volume and profitability. The relationship between cost and volume, cost and profit and volume and profit is significant. Cost has an inverse relationship with profit. Lower the cost, higher would be the profit and vice-versa. Further, the relationship between cost and volume is also negative. The higher the volume, lower would be per unit cost. Further, the per unit variable cost remains the same, the fixed cost when distributed over a larger volume, becomes less per unit of production. Thus, the total cost per unit becomes low. Volume has a direct effect on profit. Higher the volume, higher would be the profit. This cost-volume-profit relationship leads to a number of managerial decisions relating to the diverse areas of business functions.

Management could achieve the result of profit by changing one or more of these factors. Managers constantly faced with decisions about what to sold, at what rate, the trade-off between variable and fixed costs, marketing strategy and optimum use of firm's resources in pursuit of some goals or objectives. The methods used to evaluate these decisions include cost-behavior analysis, evaluation of cost-volume-profit relationships and flexible budgeting.

8.2 Meaning of CVP Analysis

The Cost-Volume-Profit analysis is a technique for studying the relationship between cost, volume and profit. Profits of business firms rely on a large number of factors. But, the most important of these

factors are the cost of production, volume of sales and the selling prices of the products. According to Herman C. Heiser, "the most significant single factor in profit planning of the average business is the relationship between the volume of business, costs and profits". Like ratio analysis, break-even-analysis, also called CVP analysis, is a tool of financial analysis.

The three factors of CVP analysis i.e. costs, volume and profit are interrelated and depend one to another. For example, profit depends upon sales, selling price to a large extent depends upon cost and cost depends upon volume of production as it is only the variable cost that varies directly with production, whereas fixed cost remains fixed regardless of the volume produced. The Cost-Volume-Profit relationship is of immense use to management as it assists in profit planning, cost control and decision-making.

The Cost-Volume-Profit analysis covers only variables and fixed expenses. In Table 1 the relationship of total costs to unit costs is shown at various levels of production. If the total fixed costs remain the same, the cost per unit decreases as volume increases. The total variable cost will increase directly with an increase in production, but the rate of increase is constant.

Table 1: A Comparison of Total Costs with unit costs of various levels of production

Production (in units)	1,000	2,000	3,000	4,000
Total cost (Rs.)				
Fixed	5000	5000	5000	5000
Variable	7000	14000	21000	28000
Unit cost (Rs./unit)				
Fixed	5.20	2.50	1.67	1.25
Variable	7.00	7.00	7.00	7.00

There are five important factors which influence cost-volume-profit analysis: (i) Fixed Costs, (ii) Variable Costs, (iii) Selling prices of products, (iv) Volume of sales or level of sales activity and (v) Mixture of the types of products sold. All of these factors must be weighted by the management when it is looking at profit planning and cost control in any organisation.

Classification of Costs

On the basis of the degree of responsiveness of the cost of various activity levels is classified into three types : fixed costs, variable costs and semi-variable costs.

(a) Fixed Cost

The costs which do not vary with the level of production are known as fixed costs. These costs are called fixed costs because they remain constant irrespective of the level of output. But, it is not necessary that fixed costs remain constant for all times. In fact, in the long run all costs have a tendency to vary. Fixed costs remain fixed upto a certain level of production, e.g. rent and depreciation.

(b) Variable Cost

The costs which vary in direct proportion to the volume of production are called variable costs. They remain change whether short run or long run, e.g. direct material, direct labour and direct chargeable expenses, such as electric power, fuel etc.

(c) Semi-Variable Costs

Those costs which are partly fixed and partly variable are called semi-variable costs. These costs vary with the level of production but not in direct proportion to the level of production, e.g. depreciation of machinery, maintenance of equipment, administrative costs etc.

Assumptions for CVP analysis :

(i) No change in Unit Selling Price : It implies that the total revenue of the firm is a linear function of the output. For firms which have a strong market for their products, this assumption is quite valid. For other firms, however, it may not be so. Price reductions might be necessary to achieve a higher level of sales. On the whole, however, this is a reasonable assumption and not unrealistic enough to impair the validity of the cost-volume-profit model, particularly in the relevant range of output.

(ii) Constancy of Product Mix : In the case of a multi-product firm, the cost-volume-profit model assumes that the product mix of the firm remains stable. Without this premise, it is not possible to define the average variable profit ratio when different products have different variable profit ratios. While it is necessary to make this assumption, it must be borne in mind that the actual mix of products may differ from the planned one. Where this discrepancy is likely to be significant, cost-volume-profit model had limited applicability.

(iii) Stability of Inventory : A final assumption underlying the conventional cost-volume-profit model is that the volume of sales is equal to the volume of production during an accounting period. On the other hand, inventory changes are assumed to be nil. This is required because in cost-volume-profit analysis, we match total costs and total revenues for a particular period.

8.3 Break Even Analysis

A break-even analysis indicates the relationship between the costs and profits with sales volume. The sales volume which equals total revenue with related costs and results in neither profit nor loss is called break-even volume or point (BEP). If all costs are assumed to be variable with sales volume, the BEP would be at zero sales. If all costs were fixed, profits would vary disproportionately with sales and the BEP would be at a point where total sales revenue equalled fixed costs. However, both are purely hypothetical situations. In real, costs consist of both fixed and variable elements.

8.3.1 Assumptions of Break-Even Analysis

The Break-even Analysis is based upon the following assumptions:

(i) All elements of cost i.e. production, administration and selling and distribution can be divided into fixed and variable components.

(ii) Variable cost remains constant per unit of output irrespective of the level of output and thus fluctuates directly in proportion to changes in the volume of output.

(iii) Fixed cost remains constant at all volumes of output.

(iv) Selling price per unit remains unchanged or constant at all levels of output.

(v) Volume of production is the only factor that influences cost.

(vi) There will be no change in the general price-level.

(vii) There is only one product or in case of multi-products, the sales mix remains unchanged.

(viii) There is synchronization between production and sales.

8.3.2 Break-Even Point

The break-even point is that point of sales volume at which total revenue is equal to total cost. It is a point of no profit, no loss. A business is said to break-even when its total sales are equal to its total costs. The break-even point refers to that level of output which evenly breaks the costs and revenues. At

this point, contribution i.e. sales minus marginal cost, equals the fixed cost and hence this point is often called as "Critical Point" or "Equilibrium Point" or "Balancing Point". If production/sales is increased beyond this level, there shall be profit to the organisation and if it is decrease from this level, there shall be loss to the organisation.

Break-even point can be stated in the form of an equation :

Sales revenue at break-even point = Fixed Costs + Variable Costs.

8.3.3 Uses or Application of Break-Even Analysis

Break-even analysis is a very useful and important technique of profit planning and decision-making. It can be applied for selecting the best proposal, for testing the profitability of proposed actions and for various other decisions. Some important areas of its uses or application are as follows:

(i) Determination of Break-even point.

(ii) Calculation of profit at different levels of sales.

(iii) Determination of sales to earn desired profit.

(iv) Fixation of new selling price at a particular break-even point.

(v) Estimation of margin of safety.

(vi) Estimation of effects of change in fixed and variable costs on B.E.P. and sales.

(vii) Calculation of necessary sales to cover proposed expenses.

(viii) Make or buy decision.

(ix) Determination of optimum sales-mix.

(x) Decision of change of capacity.

8.3.4 Limitations of break-even analysis

Break-even analysis is based on various assumptions but these assumptions have certain inherent limitations which are as follows:

(i) Division in Fixed and Variable Costs : It may be difficult to divide all costs into fixed and variable costs. Moreover, in many cases, cost may not remain either absolutely fixed or variable in relation to the volume of output.

(ii) Static Concept : The break-even analysis assumes a static situation that cannot exist for long periods of time. For example, it assumes no changes in general price-level, selling price, production technology, efficiency of machines etc. but in practice there is constant change in these factors as management wants to improve production system and increase efficiency.

(iii) Limitation of Linear Behaviour of costs : It is assumed that fixed costs are constant at all levels and variable costs vary in direct proportion to output. However, such linear behavior of costs is valid only within a limited range of operations and in many cases cost curve may not be exactly a straight line.

(iv) Difference in Production and Sales : It is not necessary that production and sales will be equal. The fact is that in practice certain level of stock is necessary.

(v) Change in Sales-mix : The quantum of production and product-mix may be kept constant but the quantum of sales and the sales-mix may not be as anticipated.

(vi) Maximum and Optimum Production : This analysis assumes that there should be maximum

production for maximum profit but in practice decision of optimum production is required and not that of maximum production.

(vii) Capital Employed is Ignored : Break-even analysis ignores the consideration of capital employed in the production and thus, presents only one side of profit planning.

(viii) Limitation of Lack of Perfect Competition : This analysis is based on the assumption of perfect competition as it is assumed that a firm can sell any quantity of its output at a given price. However, it is not true in practice.

(ix) Sale of Many Products : This analysis is of doubtful validity if the business is selling a number of products with different profit margins.

8.4 Computation of BEP

There are three methods for the computation of B.E.P.:

1. Equation method
2. Contribution method
3. Graphic method

In this text we are discussing only first two methods.

8.4.1 Equation method

This method uses the following which also expresses the relationship of the items of income statement.

Sales = Variable Expenses + Fixed Expenses + Profit

This simple equation may be used to any break-even or profit estimate situation. For example, selling price is Rs. 10 per unit; variable cost is Rs. 6 per unit and fixed cost Rs. 5000. Assuming that X is the number of units to be sold to break-even, the values in the above formula can be substituted as:

$$10X = 6X + 5000$$

Or $10X - 6X = 5000$

Or $4X = 5000$

Or $X = 5000/4 = 1250$ units.

8.4.2 Contribution method

This method is very important and useful method for the calculation of B.E.P. and its applications. This method involves two basic tools, i.e. "Contribution" and "Profit-Volume Ratio".

Contribution

It means difference between sales and the variables/marginal cost of sales. In other words, the excess of sales over its variable cost is called contribution. It is also known as "Contribution Margin" and "Gross Margin". It can also be explained that contribution refers to that excess of sales over its variable costs which are available to cover fixed cost and to earn profit. If the amount of contribution is less than fixed cost, it will be a position of loss to the firm and if it is equal to fixed cost, it will be a situation of no profit and no loss.

Suppose, selling price is Rs. 20 per unit and variable cost is Rs. 16 per unit, then contribution will be (20 - 16) Rs. 4 per unit. Similarly, if total sales of a firm is Rs. 50000 and total variable cost is Rs.

30000, then contribution will be (50000 - 30000) Rs. 20000.

The concept of contribution is very useful from the point of view of managerial decisions and it can help the management in the following calculations:

(i) Determination of Break-even- point.

(ii) Determination of selling price.

(iii) Make or buy decisions.

(iv) Selection of best option among various alternative products.

(v) Optimum product-mix for maximizing profit.

The amount of contribution can be computed as follows:

(i) Contribution = Sales - Variable Cost

(ii) Contribution = Fixed Cost + Profit / (- Loss)

(iii) Contribution = Sales X P/V Ratio

(iv) Contribution per unit = Sales per unit - Variable Cost per unit

Profit-Volume Ratio

It is ratio of contribution to sales and is expressed generally in terms of percentage. It is one of the most important ratios for studying the profitability of operations of a business. The concept of P/V ratio is also useful to calculate the break-even point, the profit at a given volume of sales, the sales volume required to earn a desired profit and volume of sales required to maintain the existing profits if selling price is reduced by a specified percentage. The following formula can be used for the calculation of P/V Ratio:

P/V Ratio = [Contribution X 100]/ Sales or

P/V Ratio = [Sales- variable cost]/Sales X 100

Example 1 : If the Sales are Rs. 1000000 and Variable Cost Rs. 400000 than Calculate P/V Ratio.

Soluction :

	Sales	1000000
Less :	Variable Cost	400000
	Contribution	600000

P/V Ratio = [Contribution X 100]/ Sales

or (600000 x 100) / 100000

or 60%.

or P/V Ratio = [Sales- variable cost]/Sales X 100

or (1000000 – 400000) / 1000000 x 100

P/V Ratio = 60%.

Cost-Volume-Profit Linkage

To understand break-even analysis, it is necessary to understand the relationship between sales, variable costs and profit. The division of costs into "variable" and "fixed" provides the establishment of a constant linkage between selling price and variable costs (provided the price levels are steady). This gives behind a surplus (contribution) out of sales revenue which also bears a constant relationship with sales.

To mention this linkage, revenue and cost data are presented in the following manner:

	Per unit Rs.	Total Rs.
Sales	--------	-------
Less: Variable cost	---------	--------
Contribution		----------
Less: Fixed cost		----------
Net profit		----------

An important result of the above presentation is the linkage of contribution to sales. The ratio of the contribution to sales in known as P/V ratio (profit-volume ratio). This ratio is significant for management accountant for decisions making. The ratio has certain special features:

(i) It enables management to ascertain total contribution in terms of rupees for a given level of sales.

(ii) It remains constant so long as the selling price and variable cost per unit remain constant or vary proportionately.

(iii) It is unaffected by any change in the level of activity. Hence, the ratio would be constant whether studied on 10,000 units basis, 100 units basis or a single unit basis.

(iv) The ratio is unaffected by any change in the fixed cost because the latter does not enter into the computation of contribution at all.

A substitute of P/V ratio is "contribution per unit". This is also an equally effective tool for the management accountant in analyzing data. The significance of P/V ratio or contribution per unit is varied and far-reaching. The following illustration is provided just to familiarize the reader with the manner in which the instrument is used.

Example 2 : ABC company produces 300 units of a product per month. The selling price is Rs. 120 and variable cost is Rs. 80 per unit. The fixed cost is Rs. 8,000 per month. Calculate: (i) the estimated profit in a month wherein 240 units are produced and (ii) the sales to be made to earn a profit of Rs. 7,000 per month.

Solution:

			Rs.
	Selling price per unit	=	120
Less:	Variable cost per unit	=	80
	Contribution per unit	=	40
	P/V Ratio	=	Contribution/selling price X 100
		=	Rs. 40/120X 100 = 33.33%

(i) Profit on sale of 240 units :

Sales of 240 units at Rs. 120 each	=	28,800

Contribution from the above at 33.33 %	=	9,600
Less: Fixed cost	=	8,000
Profit	=	1,600

This result can also be obtained as follows:

No. of units to be sold	=	240 units
Contribution per unit	=	Rs. 40
Contribution from 240 units	=	240 X 40 = Rs. 9,600
Fixed cost of the month		Rs.8,000
Profit		Rs. 1,600

(ii) Sales required to be earn a profit of Rs. 7,000

Profit required to be earned	=	7,000
Add: Fixed Profit of the month	=	8,000
Total contribution to be earned	=	15,000

P/V Ratio: 33.33%

[Sales required to earn Rs. 33.33: Rs. 100]

Sales required to earn Rs. 15,000: Rs. 15,000 X 100/33.33 = Rs. 45,000

This result can also be obtained by considering contribution per unit:

Contribution required to cover fixed cost and profit	=	Rs. 1,500
Contribution per unit	=	Rs. 40
No. of units to be sold to earn Rs. 15,000	=	15,000/40 = 375 units
Selling price per unit	=	Rs. 120
Total sales	=	375 X 120 = Rs. 45,000

Example 3 : XYZ Company produces three products A, B and C. Relevant information about these products is given below:

	A	B	C
Unit Selling Price (S)	Rs. 40	30	20
Unit Variable Price (V)	Rs. 20	16	12
Separable Fixed Costs	Rs. 1,10,000	60,000	40,000

The common fixed costs of the company are 2,00,000. They are allocated to three products in the ratio 5:3:2.

Calculate the break-even quantity for each product.

Solution :	A	B	C
Separable Fixed Costs	Rs. 1,10,000	60,000	40,000
Allocated Fixed Costs	Rs. 1,00,000	60,000	40,000
Total Fixed Costs	Rs. 2,10,000	1,20,000	80,000
Contribution Margin(S-V)	Rs. 20	14	8
Break-even Quantity	210000/20=10,500	120000/14=8,571	80000/8=10,000

8.5 Significance of CVP Analysis

Cost-volume-profit analysis is an important tool in the process of managerial decisions and it is extremely helpful to management in a variety of problems involving planning and control. The main objectives of such analysis are as follows :

(i) Setting up Flexible Budget : This analysis is helpful in setting up flexible budget which indicates that what trend of amount of sales and cost of production at different levels of activity will be.

(ii) Determination of Break-even-point : The most important objective of cost-volume-profit analysis is to find out break-even-point, i.e. the point of no profit no loss.

(iii) Profit Planning : This analysis is useful in profit planning also because whereas on the one hand, we can determine the amount of profits at different levels of activity we can also determine the volume of sales or production to earn desired profit on the other hand.

(iv) Decision relating to Selection of Alternatives : This analysis helps the management in making decision in respect of various alternative proposals, viz.,

(a) Which of the products is more profitable?

(b) Whether the firm should accept the proposal of supply of additional products at a particular price?

(c) What is the optimum mix of sales or production so that profit may become maximum?

(d) If there are limits of production capacity, which item should be produced and which should be purchased?

(v) Performance Evaluation for Control : This analysis assists in evaluation of performance for the purpose of control. On the basis of profits achieved and costs incurred it can be analyzed that what the role of volume of production and other factors was in effecting the amount of profit?

(vi) Helpful in Price Fixation : This analysis is also helpful in price fixation by studying the effect of different price structures on costs and profit.

(vii) Allocation of Overhead Costs : This analysis assists in finding out the amount of overhead costs to be charged to the products at various levels of production because pre-determined overhead rates are related to a selected volume of production.

(viii) Analysis of Effect of Changes in Cost : In practice, we find fluctuations in fixed cost, material cost, labour rate and overheads, etc. Cost-profit-volume relationship assists in analyzing the impact of these changes.

In short, cost-volume-profit analysis is the most important analysis for profit planning in any business.

8.6 Advantages of CVP Analysis

The cost behavior patterns offer valuable insights into planning and controlling long-term and short-term operations. It is obligatory that management becomes fully attentive about cost-volume-profit analysis. Management's duty is to discover the combination of fixed and variables costs that will be more beneficial to the company. A firm that has a large and highly salaried sales force (fixed cost) may discover, through the contribution margin that after deducting variable costs from sales, there is an insufficient remainder to contribute toward fixed costs and profit. It may be less costly for the company to employ manufacture representatives and compensate them using commission, a variable cost. Remuneration

would then vary directly with sales. When management sets a profit for a specific period of time (annual, semi-annual, quarterly), it is easy to compute the number of units that must be sold in order to reach the goal; this is done simply by dividing the fixed cost plus desired profit by the contribution margin per unit. When the contribution margin is low, a large increase in sales must occur in order to produce a significant increase in profit. As sales move beyond the break-even point, the contribution margin ratio increases and thus profit also increase at a faster rate.

The external analyst may be enabling to project future break-even point at various sales volumes because he or she does not ordinarily have access to data that are exact enough. Nevertheless, the analyst's conclusion although rough at best, is meaningful. The variable cost may be difficult to project, but conclusion on fixed cost should be within the company periphery. Although shortcomings in cost-volume-profit analysis do exist, and the analysis does require laborious effort, performance evaluation is less difficult given the result of such an analysis.

8.7 Limitations of CVP Analysis

The CVP analysis is a useful tool. However, it suffers from some limitations:

(i) Nature of Costs : It is very difficult to assign the nature of costs to either a fixed or variable category every time. Because, the interpretation of several analysts will probably differ. For example, machinery rent that is based on units produced can be classified as a variable cost when production varies. However, if production is steady for a period of time beyond the predetermined range, some analysts may think of the rent as a fixed cost. This differentiation is often difficult for the internal analyst to determine. For the outside analyst, categorization is an almost impossible task if he or she does not possesses a considerable amount of internal data. Direct labour is usually classified as a variable cost. Any change in production volume will have a direct effect on labour in the same direction. If management decides on a temporary shutdown of operations, the effect on the variability of labour cost may not correspond directly. If, for example, the company wishes to retain its highly experienced and skilled personnel during the shutdown period so as not to lose them, the fluctuating nature of direct labour is changed.

(ii) Useful in manufacturing units : The cost-volume-profit analysis as a planning or controlling device is used in a manufacturing unit and the analyst assumes that sales and production volumes will always be the same. Theoretically, it may be valid but not fact. Business in dynamic, and qualifying a specific cost analysis with the prefatory statement, "other things being equal," will not necessarily produce a valid result because 'other things" will not be equal. Analysis covering an extended period of time requires a common denominator for all component periods so that data examined will be equivalent. Where costs and prices have changed drastically, adjustments based on current costs and prices produce a more uniform result. Many outside factors must also be kept in mind, such as strikes, competition, domestic and foreign political developments.

(iii) Multiple products : Most of our analysis was focused on a single product firm. In case of multi-product firm a standard product mix to obtain a representative unit of production is assumed which presents difficulties in the cost allocation.

(iv) Varying Temporal Incidences : the break-even analysis ignores the time value of money. It is acceptable if costs and revenues occur more or less simultaneously. If they occur at different points of time and there are systematic differences in their temporal incidences e.g. fixed costs occur before variable costs and these two costs precede revenue generation; costs and revenue must be expressed in the present value terms.

8.8 Key Words

- **Cost Volume Profit Analysis :** The Cost-Volume-Profit analysis is a technique for studying the relationship between cost, volume and profit.
- **Cost :** Cost means the total expenditure incurred on producing a product.
- **Break Even Analysis :** A break-even analysis indicates the relationship between the costs and profits with sales volume.
- **Break Even Point :** The break-even point is that point of sales volume at which total revenue is equal to total cost.
- **Contribtuion :** Excess of sales over its variable cost is known as contribution.

8.9 Summary

Break-even analysis or Cost-Volume-Profit analysis is the most used financial analysis technique for financial planning and control in relatively simple situations. On the basis of the degree of responsiveness of the cost at various activity levels it can be classified into three types: fixed costs, variable costs and semi-variable costs. Semi-variable cost falls somewhere between fixed and variable cost elements. The P/V ratio is an important tool for measuring the contribution in present and to estimate for future.

8.10 Self Assessment Test

1. What kind of questions may be answered with the help of cost-volume-profit analysis?
2. What assumptions underlie cost-volume-profit analysis?
3. How would you calculate the overall break-even volume of a multi-product firm?
4. Discuss the limitations of cost-volume-profit analysis.
5. Explain the objectives, limitations and methods of Break-Even Point.

UNIT - 9 : LEVERAGE ANALYSIS

UNIT STRUCTURE

9.0 Objectives

After reading this unit, you should be able to

- Understand the meaning of leverage analysis
- Ascertain the operating, financial and composite leverages
- Explain the significance of financial and operating leverages.

9.1 Introduction

It is pretty apparent fundamental that an organization may raise funds required for investment either by increasing the owner's claims or the creditors claims or a mix of the both. The claim of the owners increase when the company raises funds by issuing equity shares or ploughs back its earnings. The claims of the creditors increase when the funds are raised by borrowing. The various means used to raise the funds represent the financial or the capital structure of the company. The financing or capital structure decision is of fabulous significance for the management, as it influences the debt-equity blend of the company, which ultimately affects shareholders return and risk. In case, the borrowed funds are more as compared to the owner's funds, it results in increase in shareholders earnings together with increase in their risk. This is because the cost of borrowed funds is less than that of the shareholders funds on account of cost of borrowed funds being permissible as a deduction for income-tax purposes. But at the same time, the borrowed funds carry a preset interest, which has to be paid whether the company is earning profits or not. Thus, the risk of the shareholders increases in .case there are a high proportion of borrowed funds in the total capital structure of the company. In a situation w here the percentage of the shareholders funds is more than the fraction of the borrowed funds, the return as well as the risk of the shareholders will be much less.

9.2 Meaning of Leverage

The dictionary sense of the term leverage refers to "an increased means of accomplishing some purpose." For example, leverage helps us in lifting heavy objects, which may not be otherwise feasible. Nevertheless, in the area of finance, the term leverage has a special connotation. It is used to describe the firm's ability to use fixed cost assets or funds to blow up the return to its owners.

James Van Horne has defined leverage as "the employment of an asset or funds for which the firm pays a fixed cost or fixed return." Thus, according to him, leverage results as an outcome of the firm employing an asset or source of funds, which has a fixed charge (or return). The former may be termed as

"fixed operating cost", while the latter may be termed as "fixed financial cost". It should be noted that fixed cost or return is the pivot of leverage. If it is not obligatory for a firm to pay fixed cost or fixed return, there will be no leverage. Since fixed cost or return has to be paid or incurred irrespective of the level of output or sales, the size of such cost or return has substantial influence over the amount of profits available for the shareholders. When the level of sales changes, leverage helps in quantifying such influence. It may therefore be defined as relative change in profits due to a change in sales. A high degree of leverage implies that there will be a stout change in profits due to a relatively minute change in sales and vice--versa. Thus, higher is the leverage, higher is the risk and higher is the expected return.

9.3 Types of Leverage

Leverages are of three types: (i) Operating leverage, (ii) Financial leverage and (iii) Composite leverage. Let us discuss these leverages taking one by one.

9.3.1 Operating leverage

The operating leverage may be defined as the tendency of the operating profit to vary disproportionately with sales. It is assumed to exist when a firm has to pay fixed cost regardless of level of output or sales. The firm is said to have a high degree of operating leverage if it employs a greater amount of fixed costs and a small amount of variable costs. On the other hand, a firm will have a low operating leverage when it employs a greater amount of variable costs and a smaller amount of fixed costs. Thus, the degree of operating leverage depends upon the amount of fixed elements in the cost structure. Operating leverage in a firm is a function of three factors:

(a) The amount of fixed costs.

(b) The contribution margin.

(c) The volume of sales.

Of course, there will be no operating leverage, if there are no fixed operating costs.

Computation of Operating Leverage: The operating leverage can be calculated by the following formula:

$$\text{Operating Leverage} = \frac{\text{Contribution [C]}}{\text{Operating Profit [OP]}}$$

Operating profit here means "Earning Before Interest and Tax" (EBIT).

Operating leverage may be favourable or unfavourable. In case the contribution (i.e., sales less variable cost) exceeds the fixed cost, there is favourable operating leverage. In a reverse case, the operati,ng leverage will be termed as unfavourable.

Degree of operating leverage. The degree of operating leverage may be defined as percentage change in the profits resulting from a percentage change in the sales. It may be put in the form of following formula:

$$\text{Degree of operating leverage} = \frac{\text{Percentage change in operating profits}}{\text{Percentage change in sales}}$$

Usefulness: The operating leverage indicates the impact of change in sales on operating income. If a firm has a high degree of operating leverage, small changes in sales will have large effects on operating income. In other words, the operating profits [EBIT] of such a firm will increase at a quicker rate than the increase in sales. Similarly, the operating profits of such a firm will suffer a greater loss as compared to

reduction in its sales. Generally, the firms do not like to operate under conditions of a high degree of operating leverage. The concept of operating leverage will be apparent with the help of the following illustration:

Illustration 9.1: The installed capacity of a factory is 600 units.

Actual capacity used is 400 units. Selling price per unit is RS.I0 and variable cost is Rs. 6 per unit. Calculate the operating leverage in each of the following three situations:

1. When fixed costs are Rs. 400.
2. When fixed costs are RS. l,000.
3. When fixed costs are Rs. l,200.

Solution: Statement showing operating leverage

		Situation 1	**Situation 2**	**Situation** 3
		(Rs.)	**(Rs.)**	**(Rs.)**
(i)	Sales	Rs.4000	4000	4000
(ii)	Variable cost	2400	2400	2400
(iii)	Contribution (i-ii)	1600	1600	1600
(iv)	Fixed cost	400	1000	1200
(v)	Operating profit (iii-iv)	1200	600	400
(vi)	Operating Leverage[C/OP]	1600/1200	1600/600	1600/400
	=	**1.33**	**2.67**	4

The above illustration shows that the degree of operating leverage increases with every increase in share of fixed cost in the total cost structure of the firm. It shows, for example, in 'Situation 3' that if sales increase by rupee one, the profit would increase by Rs.4. This can be verified by taking 'Situation 3' when sales increase to Rs.8000, the profit in such an event will be as follows:

Sales	8000
Variable cost	4800
Contribution	3200
Fixed cost	1200
Profit	2000

Thus, the sales have increased from Rs.4000 to Rs.8000, i.e. a hundred percent increase. The operating profits have increased from Rs. 400 to Rs.2000, i.e. by RS.1600 (giving an increase of 400 percent).

The operating leverage is 4 in case of 'Situation 3', which indicates that with every increase of one rupee in sales the profit will increase four times. This has been verified by the above illustration where a hundred percent increase in sales has resulted in 400 percent increase in profits. The degree of operating leverage may, therefore, be put as follows:

$$\text{Degree of operating leverage} = \frac{\text{\%age change in operating income}}{\text{\%age change in sales}}$$

= 400/100

=4

As a matter of fact, operating leverage exists only when the quotient in the above equation exceeds one.'

9.3.2 Financial Leverage

The financial leverage may be defined as the propensity of the residual net income to vary disproportionately with operating profit. It indicates the change that takes place in the taxable income as a result of change in the operating income. It signifies the survival of fixed interest/fixed dividend bearing securities in the total capital structure of the company. Thus, the use of fixed interest/dividend bearing securities such as debt and preference capital along with the owners' equity in the total capital structure of the company is described as financial leverage.

Favourable and unfavourable financial leverage: Financial leverage may be favourable or unfavourable depending upon whether the earnings made by the use of fixed interest or dividend bearing securities exceeds the explicit fixed cost, the firm has to pay for the employment of such funds, or not. The leverage will be considered to be favourable if the firm earns more on assets purchased with the funds than the fixed costs of their use. Unfavourable or negative leverage occurs when the firm does not earn as much as the funds cost.

Trading on equity and financial leverage: Financial leverage is also sometimes termed as "trading on equity". However, most of the scholars on financial management are of the opinion that the term trading on equity should be used for the term financial leverage only when the financial leverage is favourable. The company resorts to trading on equity with the objective of giving the equity shareholders a high rate of return than the general rate of earning on capital employed in the company, to compensate them for the risk that they have to swallow. For example, if a company borrows RS.1000 at 9% interest per annum, and earns a return of 14% the balance of RS.5 per annum after payment of interest will belong to the shareholders and thus they can be paid a higher rate of return that than general rate of earning of the company. But in case the company could earn a return of only 7% on Rs. 1000 employed by it, the equity shareholders loss would be RS.2 per annum. Thus, the financial leverage is a double-edged blade. It has the potentiality of increasing the return to equity shareholders, but at the same time creates additional risk for them.

Computation of Financial Leverage: The computation of financial leverage can be done according to the following methods:

(i) Where capital structure consists of equity shares and debt: In such a case, financial leverage can be calculated according to the following formula:

Financial leverage = OP / PBT

Where, OP = Operating profit or earning before interest and tax. (EBIT)

PBT = Profit before tax but after interest.

Illustration 9.2: A company has any choice of the following three financial plans. You are required to calculate the financial leverage in each case and interpret it.

	X	Y	Z
Equity Capital	2000	1000	3000
Debt	2000	3000	1000
Operating Profit (EBIT)	400	400	400

Interest 10% on debt in all cases and tax rate 50% only.

Solution: The financial leverage will be computed as follows in case of each of these financial plans:

	X	Y	Z
Operating Profit (OP)	400	400	400
Interest (10% on debt)	200	300	100
Profit before tax (PBT)	200	100	300
Financial leverage	400/200	400/100	400/300
=	2	4	1.33

Financial leverage, as explained earlier, indicates the change that will take place in the taxable income as a result of change in the operating income. For example, taking Financial Plan X as the basis, if the operating profit decreases to Rs.200, its impact on taxable income will be as follows:

Operating Profit (OP or EBIT)	RS.200
Less: Interest	RS.200
Profit before tax (PBT)	NIL

Financial leverage in case of plan X is 2. It means every 1% change in operating profit will result in 2% change in the taxable profit. In the above case operating profit has decreased from Rs.400 to RS.200 (i.e. 50% decrease), as a result the taxable profit has decreased from RS.200 to zero (100% decrease).

Degree of Financial leverage. Degree of financial leverage may be defined as the percentage change in taxable profit as a result of percentage change in operating profit.

This may be put in the form of following equation:

$$\text{Degree of financial leverage (DFL)} = \frac{\text{Percentage change in taxable income}}{\text{Percentage change in operating income}}$$

For example, in the above case the degree of financial leverage will be "2" calculated as follows:

$$100/50 = 2$$

It should be noted that financial leverage exists only when the quotient as per the above equation is more than one.

(ii) *Where the capital structure consists of preference shares and equity shares.* The above formula for computation of financial leverage can also be applied to a financial plan having preference shares. Of course, the amount of preference dividends will have to be grossed up (as per the tax rate applicable to the company) and then deducted from the earnings before interest and tax.

Illustration 9.3: The capital structure of a company consists of the following securities:

10% Preference share capital	RS. 100000
Equity share capital (Rs. 10/- per share)	RS. 100000
The amount of operating profit is	RS. 60,000

The company is in 50% tax bracket. You are required to calculate the financial leverage of the company. What would be new financial leverage if the operating profit increases to RS.90000 and read

between the lines your results.

Solution: Computation of the present financial leverage

Operating profit (OP or EBIT)	Rs.60,000
Less: Preference Dividend (after grossing up)	Rs.20,000
PBT	Rs.40,000

Present Financial Leverage = OP/PBT = 60000/40000=1.5

Computation of new financial leverage

New operating Profit	RS.90000
Less: Preference Dividend (after grossing up)	RS.20000
PBT	RS.70,000

Present Financial Leverage = OP/PBT = 90000170000=1.286

The existing financial leverage is 1.5. It means 1% change in operating profit (OP or EBIT) will cause in taxable profit (PBT) in the same direction. For example, in the present case operating profit has increased by 50% (i.e. from Rs. 60000 to Rs. 90000). This has resulted in 75% increase in the taxable profit (i.e. from Rs. 40000 to Rs. 70000).

(iii) Where the capital structure consists of equity shares, preferences, shares and debt.

In such a case the financial leverage is calculated for deducting from operating profit both interest and preference dividend on a before tax basis.

Illustration 9.4*:* A company has the following capital structure: Equity share capital Rs. 1,00,000, 10% Preference share capital Rs. 1,00,000, 8% Debentures Rs. 1,25,000 The present EBIT is Rs. 50,000. Calculate the financial leverage assuming that company is in 50% tax bracket .

Solution

Operating Profit	Rs.50,000
Less: Interest on debenture	Rs.10,000
Less: Pref. dividend (pre-tax basis)	Rs.20,000
Profit before tax	Rs.20,000

Financial leverage = OP/ PBT = 50,000/ 20,000 = 2.5

Alternative definition of financial leverage: One of the objectives of planning an appropriate capital structure is to maximize the return on equity shareholder's funds or maximize the earning per share (EPS). Some scholars have used the terms "financial leverage" in the context that it defines the relationship between EBIT and EPS. According to Gitman, financial leverage is "the ability of a firm to use fixed financial charges to blow up the effects of changes in EBIT on the firm's earning per share". The financial leverage therefore indicates the percentage change in earning per share m relation to a percentage change in EBIT.

The degree of financial leverage as per the above definition can be calculated according to the following equation:

$$\text{Degree of financial leverage} = \frac{\text{Percentage change in EPS}}{\text{Percentage change in EBIT}}$$

Of course, there will be no financial leverage according to the above equation if the quotient does not exceed one.

Illustration 9.5: A company has the following capital structure;

10,000 Equity shares of Rs. 10 each	Rs. 1,00,000
2,000 10% Pref. shares ofRs. 100 each	Rs. 2,00,000
2,000 10% Debentures of Rs. 100 each	Rs. 2,00,000

Calculate the EPS for each of the following levels of EBIT:

(i) Rs. 1,00,000

(ii) Rs. 60,000

(iii) Rs. 1,40,000.

The company is in 50% tax bracket. Calculate also the financial leverage using EBIT level under (i) as base

Solution: Computation of earning per share

	(i)	**(ii)**	**(iii)**
EBIT	Rs. 1,00,000	60,000	1,40,000
Less; Interest on debenture	20,000	20,000	20,000
PBT	80,000	40,000	1,20,000
Less: Income Tax	40,000	20,000	60.000
PAT	40,000	20,000	60,000
Less: Preference dividend	20,000	20,000	20,000
Earning available for equity Shareholders (EAS)	20,000	_	40,000
Earning per share (EPS)	2	Nil	4

The above table shows that (a) in case (ii) the EBIT has decreased by 40% (i.e. from Rs. 1,00,000 to Rs. 60,000 while the earning per share has decreased by 100% (from Rs. 2 per share to nil); (b) in case (iii) the EBIT has increased by 40% (from Rs. 1,00,000 to Rs. 1,40,000 as compared to case (i), while the earning per share has increased by 100% (from Rs. 2 to Rs. 4).

The degree of financial leverage can therefore be computed as follows:

$$DFL = \frac{\text{Percentage change in EPS/Percentage change in EBIT}}{\text{Financial Leverage in between (i) and (ii) =100/40=2.5}}$$

Financial Leverage in between (i) and (iii) =100/40=2.5 The same result can be obtained by using the equation OP/PBT as shown below.

Computation of financial leverage

		(i)	(ii)	(iii)
OP		Rs. 1.00,000	60,000	1,40,000
Less; Interest 20,000 preference				
Dividend (Grossed up)	40,000	60,000	60,000	60,000
PBT		40,000	X	80,000

Financial leverage = OP/PBT= 2.5

This means that with every 1% change in operating profit (OP), profit before tax (PBT) will change (in the same direction) by 2.5%. For example, in situation (ii) OP has decreased by 40%. This has resulted in decrease of PBT by 100% (i.e., 40 x 2.5). In situation (iii) OP has increased by 40%. This has resulted of PBT by 100% (i.e., 40 x 2.5).

Usefulness: Financial leverage helps considerably the financial manager while devising the capital structure of the company. A high financial leverage means high fixed financial costs and high financial risk. A financial manager must plan the capital composition in a way that the firm is in a position to meet its fixed financial costs. Increase in fixed financial costs requires indispensable increase in EBIT level. In the event of collapse to do so, the company may be in principle forced into insolvency.

9.3.3 Composite Leverage

As discussed in the foregoing sections, operating leverage measures percentage change in operating profit due to percentage change in sales. It explains the degree of operating risk. Financial leverage measures percentage change in taxable profit (or EPS) on account of percentage change in operating profit (i.e., EBIT). Thus, it explains the degree of financial risk. Both these leverages are closely related with the firm's capacity to meet its fixed costs (both operating and financial). In case both the leverage are combined, the result obtained will unveil the effect of change in sales over change in taxable profit (or EPS).

Composite leverage thus expresses the relationship between revenue on account of sales (i.e. contribution or sales less variable cost) and the taxable income. It helps in finding out the resulting percentage change in taxable income on account of percentage change in sales. This can be computed as follows:

Composite leverage = Operating leverage x Financial leverage

$= C/OP \times OP/PBT = C/PBT$

Where C = Contribution (i.e. sales - variable cost)

OP = Operation Profit or Earning before Interest and Tax

PBT = Profit before Tax but after Interest.

The computation of the composite leverage can be explained with the help of the following illustration:

Illustration 9.6: A company has sales of Rs. 1,00,000. The variable costs are 40% of the sales while the fixed operating costs amounts to Rs. 30,000. The amount of interest on long-term debt is Rs. 10,000. You are required to calculate the composite leverage and illustrate its impact if sales increase by 5%.

Solution: Statement showing computation of composite leverage

Sales	1,00,000
Less: Variable costs (40% of sales)	40,000
Contribution (C)	60,000

Less: Fixed operating costs	30,000
Earning before interest and tax (EBIT) or	30,000
Operating profit (OP)	
Less:Interest	10,000
Taxable Income (PBT)	20,000

Composite leverage = C/PBT = 60000/20000 = 3.

The composite leverage of '3' indicates that with each increase of Re. 1 in sales, the taxable income will increase by Rs. 3 (i.e. 1 x 3).

This can be verified by the following computations when the sales increase by 5%.

Sales	1,05,000
Less: Variable costs	42,000
Contribution (C)	63,000
Less: Fixed operating costs	30,000
Earning before interest and tax (EBIT) or Operating profit (OP)	33,000
Less: Interest	10,000
Taxable Income (PBT)	23,000

It is clear from the above computation that on account of increase in sales by 5% the profit before tax has increased by 15%. This can be verified as follows:

Increase in percentage profits = [Increase in profit/Base Profit] X 100 = [3,000/20,000] X 100 = 15%

9.4 Significance of Financial and Operative

The operating leverage and the financial leverage are the two quantitative tools used by the financial experts to measure the return to the owners (viz., earning per share) and the market price of the equity shares. The financial leverage is considered to be superior of these two tools, since it focuses the attention on the market price of the shares, which the management always tries to increase by increasing the net worth of the firm. The management for this purpose resorts to trading on equity because when there is increase in EBIT then there is corresponding increase in the price of the equity shares. However, a firm cannot go indefinitely in raising the debt content in the total capital structure of the company. If a firm goes on employing greater proportion of debt capital, the marginal cost of debt will also go on increasing because the subsequent lenders will demand higher rate of interest. The company's inability to offer sufficient assets and security will also stand in the way of further employment of debt capital. Moreover, a firm with widely fluctuating income cannot afford to employ a high degree of financial leverage.

A company should try to have a balance of the two leverages because they have got remarkable acceleration or deceleration effect on EBIT and EPS. It may be noted that a right combination of these leverages is a very big challenge for the management. A proper combination of both operating and financial leverages is a blessing for the firm's growth while an Improper combination may prove to be a curse.

A high degree of operating leverage together with a high degree of financial leverage makes the position of the firm very risky. This is because on the one hand it is employing excessively assets for which it has to pay fixed costs and at the same time it is also using a large amount of debt capital. The fixed costs

towards using assets and fixed interest charges bring a greater risk to the firm. **In** case, the earnings fall, the firm may not be in a position to meet its fixed costs. Moreover, greater fluctuations in earnings are likely to occur on account of the existence of a high degree of operating leverage. Earnings to the equity shareholders will also fluctuate widely on account of existence of a high degree of financial leverage. The existence of a high degree of operating leverage will result in a more than proportionate change in operating profits even on account of a small change is sales. The presence of a high degree of financial leverage causes a more than proportionate change in EPS even on account of a small change in EBIT. Thus, a firm having a high degree of financial leverage and a high degree of operating leverage has to face the problems of inadequate liquidity or insolvency in one or the other year. It does not, however, mean that a firm should opt for low degree of operating and financial leverages. Of course, such lower leverages indicate the cautious policy of the management, but the firm. will be losing many profit earning opportunities. A firm should, therefore, make all possible efforts to combine the operating and financial leverage in a way that suits the risk bearing capacity of the firm. It may be observed that a firm with high operating leverage should not have a high financial leverage. **In** fact, it should have a low financial leverage. Similarly, a firm having a low operating leverage will stand to gain by having a high financial leverage provided it has enough profitable opportunities for the employment of borrowed funds. However, low operating leverage and a high financial leverage is well thought-out to be an ideal situation for the maximization of the profits with bare minimum of risk.

Illustration 9.7: The capital structure of the Delhi Progressive Corporation consists of an ordinary share capital of Rs. 10,00,000 (shares of Rs. 10 per value) and Rs. 10,00,000 of 10% debentures. Sales increased by 20% from 1,00,000 units to 1,20,000 units, the selling price is Rs. 10 per unit: variable cost amounts to Rs. 6 per unit and fixed expenses amount to Rs. 2,00,000. The income tax rate is assumed to be 50 per cent. You are required to calculate the following:

(i) the percentage increase in earnings per share:

(ii) the degree of financial leverage at 1,00,000 units and 1,20,000 units.

Comment on the behaviour of operating and financial leverages in relation to increase in production from 1,00,000 units to 1,20,000.

Solution: Delhi Progressive Corporation statement showing EPS and operation and financial leverages at two level of operation

	1,00,000 Units	1,20,000 Units
Sales (@ Rs. 10 per unit)	Rs. 10,00,00	Rs. 12,00,000
Less: Variable costs	6,00,000	7.20,000
Contribution (C)	4,00,000	4,80,000
Less: Fixed expenses	2,00,000	2,00,000
Operating Profit (EBIT or OP)	2,00,000	2,80,000
Less: Interest	1,00,000	1,00,000
Profit before tax (PBT)	1,00,000	1,80,000
Less: Tax 50%	50,000	90,000
Profit after tax on Net Profit	50,000	90,000

(i) EPS : Profit after tax Number of ordinary shares

= Rs. 50,000/10,000 Rs. 90,000/10,000

= Rs.5. Rs.9.

Percentage increase in EPS 80%

(ii) Operating leverage

C/OP 4,00,000/2,00,000 = 2 4,80,000/2,80,000 = 1.71

(iii) Financial Leverage

OP/PBT 2,00,000/1,00,000 = 2 2,80,000/1,80,000 = 1.55

Comments: On account of increase in sales from 1,00,000 units to 1,20,000 units at the rate of Rs. 10 per unit, EPS rises by 80% while the operating leverage comes down from 2 to 1.71 and financial leverage declines from 2 to 1.55. There is, therefore, a significant decrease in both the business risk and the financial risk of the company on account of reduction in both the leverages. This is generally the result when there is increase in sales without any increase in fixed operating or financial costs.

9.5 Summary

The operating leverage and the financial leverage has a great utility for the financial manager. Since they disclose the extent of both operating and financial risk assumed by a company under a particular situation, both the leverages should neither be too high nor too low. A high degree of this leverage will indicate that the company is working under a very high risky situation while a too low leverage will indicate that the company is observing extra conservatism at the cost of equity shareholders. A financial manager would try to keep the financial leverage high and the operating leverage low to maximize the earnings per share. In case, the financial leverage is high, he should try to bring down the financial leverage gradually. Combined leverage express the relationship between the revenue in the account of sales and the taxable income. Analysis of leverages is thus very crucial in financial decision-making.

9.6 Key Words

- **Leverage:** It is the ability of a firm in employing long-term funds having a fixed cost, to enhance returns to the owners.
- **Operating Leverage:** Operating leverage is the responsiveness of firm's EBIT to the changes in sale value.
- **Financial Leverage:** It is the. propensity of the residual net income to vary disproportionately with operating profit.
- **Composite Leverage:** It may be defined as the potential use of fixed costs, both operating and financial, which magnifies the effect of sales volume changes on the EPS of the firm.

9.7 Self Assessment Test

1 What is meant by "Operating leverage" and "Financial leverage"?

2 Distinguish the operating leverage from financial leverage. Explain the uses of operating leverage.

3 The capital structure of HB Limited consists of equity share capital of Rs. 1,00,000 (10,000 shares of Rs. 10 each) and 8% debentures of Rs. 50,000. You are required to calculate and verify the degree of financial leverage on earning before interest and tax (EBIT) level of Rs. 20,000.

4 An analytical statement of MRP Company is shown below:

It is based on an output (sales) level of 80,000 units. Sales Rs. 9,60,000, Variable cost 5,60,000, Revenue before fixed costs 4,00,000.

Fixed costs	2,40,000
Interest	60,000
Earning before tax	1,00,000
Tax	50,000
Net Income	50,000

Calculate the degree of (i) operating leverage (ii) financial leverage, and (iii) the combined leverage from the above data.

UNIT - 10 : SOURCES OF LONG-TERM FINANCE

STRUCTURE

10.0 Objectives

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

- Explain the features of ordinary shares, debentures/bonds, term loan, preference capital and retained earnings
- Understand the benefits and valuation of rights shares.
- Describe the features of innovative instruments like convertible debentures, warrants, and deep-discount bonds.

10.1 Introduction

Finance is the lifeblood of business concern, because it is interlinked with all activities performed by the business concern. In a human body, if blood circulation is not proper, body function will stop. Similarly, if the finance not being properly arranged, the business system will stop. Arrangement of the required finance to each department of business concern is highly a complex one and it needs careful decision. Quantum of finance may be depending upon the natue and situation of the business concern.

To support its long-term investments, a firm must find the means to finance them. Equity and debt represent the two broad sources of long-term finance for a business firm. Equity consists of equity capital, retained earnings, and preference capital. Debt consists of term loan, debentures, and short-term borrowings.

10.2 Equity Shares

Equity shares represent the ownership position in a company and its owners-ordinary shareholders share the risk and rewards associated with the ownership of companies. Ordinary shares are the source of permanent capital since they do not have a maturity date. On the capital contributed by shareholders they are entitled for dividends. The amount or rate of dividend is not fixed; it is decided by the company's board of directors. Being the owners of the company, shareholders bear the risk of ownership; they are entitled to dividends after the income claims of others have been satisfied.

Equity shares have typically a par/face value in terms of the price for each share, the most popular denomination being Rs. 10. The price at which the equity shares are issued is the issue price. The issue price for new companies is generally equal to the face value. It may be higher for existing companies, the

excess being share premium. The book value of ordinary shares refers to the paid-up capital plus reserves and surplus (net worth) divided by the number of outstanding shares. The price at which equity shares are traded in the stock market is their market value. However, the market value of unlisted shares is not available.

Features

The ordinary shares have some special features which are as follows:

1. **Residual Claim to Income:** The equity investors have a residual claim to the income of the firm. The income left after satisfying the claims of all other investors belongs to the equity shareholders. This income is simply equal to profit after tax minus preferred dividend.

   The income of equity shareholders may be retained by the firm or paid out as dividends. Equity earnings which are ploughed back in the firm tend to increase the market value of equity shares and equity earnings distributed as dividend provide current income to equity shareholders. For example, if a firm earns Rs. 16 million during the year and pays dividend of Rs. 7 million, the value of equity shares may rise by about Rs. 9 million, the amount retained by the firm. Equity shareholders thus receive benefits in two ways: dividend income of Rs. 7 million and capital appreciation of Rs. 9 million.

   The dividend decision is the prerogative of the board of directors and equity shareholders cannot challenge this decision in a court of law. In this respect, the position of equity shareholders differs markedly from that of suppliers of debt capital.

2. **Claim on Assets**: The ordinary shareholders' claim in the assets of the company is also residual in that their claim would rank after the claims of the creditors and preference shareholders in the event of liquidation. If the liquidation value of assets is insufficient, their claims may remain unpaid.

3. **Right to control**: As owners of the company, the equity holders have the right to control the operations of the company. Their control is, however, indirect. The major policies/decisions are approved by the board of directors and the board-appointed management carries out the day-to-day operations. The shareholders have the legal right/power to elect the board of directors as well as vote on every resolution placed in various meetings of the company. Though, in theory, they have indirect right to control but in actual practice, it is weak and ineffective partly because of the apathy and indifference of the majority of the shareholders who rarely bother to cast their votes and partly because scattered equity holders are unable to exercise their collective power effectively.

4. **Voting rights**: Equity shareholders are required to vote on a number of important matters. The most significant proposals include: election of directors and change in the memorandum of association. For example, if the company wants to change its authorised share capital or objectives of business, it requires shareholders' approval. Directors are elected at the annual general meeting (AGM) by the majority votes. Each ordinary share carries one vote. Thus, an ordinary shareholder has votes equal to the number of shares held by him. Shareholder may vote in person or by proxy. A proxy gives a designated person right to vote on behalf of a shareholder at the company's annual general meeting.

5. **Pre-emptive rights:** The pre-emptive right entitles a shareholder to maintain his proportionate share of ownership in the company. The law grants shareholders the right to purchase new shares in the same proportion as their current ownership. Thus, if a shareholder owns I per cent of the company's ordinary shares, he has pre-emptive right to buy I per cent of new shares issued. A shareholder may decline to exercise this right. The shareholder's option to purchase a stated number of new shares at a specified price during a given period are called rights. These rights can be exercised at a subscription price which is generally much below the share's current market price, or they can be allowed to expire, or they can be sold in the stock market.

6. **Limited liability** : Ordinary shareholders are the true owners of the company, but their liability is limited to the amount of the face value of the shares. If a shareholder has already fully paid the issue price of shares purchased, he has nothing more to contribute in the event of a financial distress or liquidation. This position of shareholders is different from the owners in the case of sole proprietary businesses or partnership firms where they have unlimited liability. The limited liability feature of ordinary share encourages otherwise unwilling investors to invest their funds in the company. Thus, it helps companies to raise funds.

Advantages and Disadvantages of Equity Financing

As the single most important source of long-term funds, equity capital has merits as well demerits from the viewpoint of the company as well as the shareholders.

Advantages: The advantages of equity capital to a company are: first, it is a permanent source of funds without any repayment liability; second, it does not involve obligatory dividend payment and; thirdly, it forms the basis of further long-term financing in the form of borrowing related to the creditworthiness of the finn.

Disadvantages

The following are the disadvantages of equity financing:

- Shares have a higher cost at least for two reasons: Dividends are not tax deductible as are interest payments, and flotation costs on ordinary shares are higher than those on debt.
- Ordinary shares are riskier from investors' point of view as there is uncertainty regarding dividend and capital gains. Therefore, they require a relatively higher rate of return. This makes equity capital as the highest cost source of finance.
- The issue of new ordinary shares dilutes the eXlstmg shareholders' earnings per share if the profits do not increase immediately m proportion to the increase in the number of ordinary shares.
- The issuance of new ordinary shares may dilute the ownership and control of the existing shareholders. While the shareholders have a pre-emptive right to retain their proportionate ownership, they may not have funds to invest in additional shares. Dilution of ownership assumes great significance in the case of closely-held companies.

10.3 Right Issue of Equity Shares

A right issue involves selling of ordinary shares to the existing shareholders of the company. When a company issues additional equity capital, it has to be offered in the first instance to the existing shareholders on a pro rata basis. This is required under Section 81 of the Companies Act, 1956. The shareholders, however, may by a special resolution forfeit this right, partially or fully, to enable the company to issue additional capital to public.

Features of Rights

1. The number of rights that a shareholders gets is equal to the number of shares held by him.
2. The number of rights required to subscribe to an additional share is determined by the issuing company.
3. The price per share for additional equity, called the subscription price, is left to the discretion of the company.
4. Rights are negotiable. The holder of rights can sell them.

5. Rights can be exercised only during a fixed period which is usually about 30 days.

Consequences of a Rights Issue

To answer the question: What are the likely consequences of a rights issue on the market value per shan;, value of a right, earnings per share, and the wealth of shareholders? , let us look at the illustrative data of the Anita and Sunita Company given in Table 11.1

Table 11.1 Illustrative Data of the Anita and Sunita Company

Paid-up equity capital (1,000 shares of Rs. 10 each)	Rs. 10,000
Retained earnings	20,000
Earnings before interests and taxes	12,000
Interest	2,000
Profit before tax	10,000
Taxes (50 per cent)	5,000
Profit after taxes	5,000
Earnings per share	RS.5
Market price per share(Price-earnings ratio of 8 is assumed)	RS.40
Number of additional equity shares proposed to be issued as rights shares	200
Proposed subscription price	RS.20
Number of existing shares required for a rights	
share (1,000/200)	5

Value of Share

The value of share, after the rights issue, is expected to be :

$$\frac{NP_o + S}{N + 1} \qquad \text{Equation 11.1}$$

Where N = number of existing shares required for a rights share

Po = cum-rights market price per share

S = subscription price at which the rights share are issued.

The rationale behind this formula is as follows: For every N shares before the rights issue, there would be N+ 1 shares after the rights issue. The market value of these N+ 1 shares is expected to be themarket value of N cum-rights shares plus S, the subscription price.

Applying this formula to the data given in Table 11.1 we find that the value per share after the rights issue is expected to be :

$$\frac{5 \times 40 + 2}{5 + 1} = \text{Rs. } 36.67$$

Value of Right

The theoretical value of a right is

$$\frac{NP_o + S}{N+1} \qquad \text{Equation 11.2}$$

The value is determined as follows. The difference between the market price of a share after the rights issue and the subscription price is the benefit derived from N rights, which are required along with the subscription price to obtain one rights shares. This means that the value of N rights is :

$$\frac{NP_o - S}{N+1} \quad S = \frac{NP_o - S}{N+1} \qquad \text{Equation 11.3}$$

Hence the value of one right is

$$\frac{N(P_o - S)}{N+1} \times \frac{1}{N} = \frac{P_o - S}{N-1} \qquad \text{Equation 11.4}$$

Apply the above formula to the data given in the Table 11.1 we find that the value of a right of the Anita and Sunita Company is

$$\frac{40 - 20}{5+1} = Rs.3.33$$

Affect on Wealth of Shareholders

The wealth of existing shareholders, is not affected by the rights offering, provided the existing shareholders exercise their rights in full or sell their rights. To illustrate this point, consider what happens to a shareholder who owns 100 equity shares of the Anita and Sunita Company that has a market value of Rs. 40 each before the rights issue. The impact on his wealth when he exercises his rights, when he sells his rights, and when he follows his rights to expire is shown below :

He exercises his rights

Market value of original shareholding at the rate of Rs. 40 per share	= Rs.	4,000
Additional subscription price and for 20 rights shares at the rate of Rs. 20 per share	= Rs.	400
Total investment	= Rs.	4,400
Market value of 120 shares at the rate of Rs. 36.67 per share after the rights subscription	=Rs.	4,440
Change in wealth (Rs. 4,400 - Rs. 4,400)	=Rs.	0

He sells his rights

Market value of original shareholding at the rate of Rs. 40 per share	=Rs.	4,000

Value realised from the sale of 100 rights at Rs. 3.33 per right	=Rs.	333
Market value of 100 shares held after the rights issue at the rate		
ofRs. 36.67 per share	=Rs.	3,667
Change in wealth (Rs. 3,667+Rs 333 - Rs. 4,000)	=Rs.	0
He allows his rights to expire		
Market value of original shareholding at the rate of Rs. 40 per share	=Rs.	4,000
Market value of 100 shares and after the rights issue at the		
rate of Rs. 36.67 per share	=Rs.	3,667
Change in wealth (Rs. 3,667 - Rs. 4,000)	=Rs.	(333)

Setting the Subscription Price

The subscription price, infact, is irrelevant because the wealth of a shareholder who subscribes to the rights shares or sells the rights remains unchanged, irrespective of what the subscription price is. To illustrate this point, consider a shareholder who has N shares valued at Po and who enjoys the right to subscribe to an additional share for S. His total investment would be:

$$NP_o + S \qquad \text{Equation 11.5}$$

The value of his shareholding after subscription would be :

Number of shares x Market value per share after rights issue

This is equal to :

$$(N+1)x\frac{NP_o + S}{N+1} = NP_o + S \qquad \text{Equation 11.6}$$

Thus the value of his shareholding after subscription is equal to the value of his investment, irrespective of the subscription price S.

Practically, the subscription price is important. Existing shareholders do not like the idea of S being higher than Po because when S is higher than Po, the market value after issue would be lower than S. Non-shareholders, who have an opportunity to subscribe to shares not taken by existing shareholders, will have no interest in the shares if S is higher than Po because they would then suffer a loss when the market value falls below S after the issue.

Due to the above consideration, S has to be set equal to or lower to Po'A value of S equal to Po is not advisable because it has no appeal to existing shareholders and other investors as they do not see any opportunity of gain in such a case. So, S has to be set lower than Po, In determining S, the following considerations should be borne in mind:

1. The lower the S in relation to Po, the greater is 'the probability of the success of offering.
2. When S is set low, a large number of rights shares have to be issued to raise a given amount of additional capital. If the company wishes to maintain a certain level of earnings per share and/or dividend per share, it would find it difficult to do so when S is set low.
3. The expectations of investors, the fluctuation of the share, the size of rights issue in relation to existing equity capital, and the pattern of shareholding are important factors in determining what S is acceptable to investors.

The subscription price for a right issue may be decided after taking into account several things: state of the capital market, the trend of share prices in general and of the company's shares in particular, the ruling cum-rights price, the ratio or proportion of the rights issue to the existing equity capital of the firm, the break-up value of the share, the profit-earning capacity of the firm, the dividend record of the firm, and the resources position of the firm.

Comparison between Right Issue and Public Issue

1. A right issue, in comparison with a public issue, is likely to be more successful because it is made to investors who are familiar with the operations of the company.

2. Since the rights issue is not underwritten, the floatation costs of a rights issue are significantly lower than those of a public issue.

3. A rights issue generally has to be made at a lower price than a public issue because existing shareholders expect rights issue to be made at a lower price. Due to this, a rights issue tends to result in a dilution of earnings per share.

Advantages and Disadvantages of Rights Issue

The main advantages of the rights issue are (1) The existing shareholders' control is maintained through the prorata issue of shares. This is significant in the case of closely-held company or when a company is going into financial difficulties or is under a takeover threat; (2) Raising funds through the sale of rights issue rather than the public issue involves less flotation costs as the company can avoid underwriting commission; and (3) **In** the case of profitable companies, the issue is more likely to be successful since the subscription price is set below the current market price.

The main disadvantage to the shareholders who fail to exercise their rights is they lose in terms of decline in their wealth. Yet another disadvantage is for those companies whose shareholding is concentrated in the hands of financial institutions because of the conversion of loan into equity. They would prefer public issue of shares rather than the rights issue.

10.4 Retained Earnings

The internal sources of long-term funds of an existing company consist of depreciation charges and retained earnings. The depreciation charges are normally used to replace the concerned asset (s). In a way, therefore, the only internal source of financing expansion/growth/diversification for such companies are retained earnings. In fact, they are an important source of long-term finance for corporate enterprises.

As a source of long-term finance, retained earnings have some commendable features. They are readily available to the firm. Flotation costs and losses on account of underpricing associated with external equity are avoided/eliminated. There is also no dilution of control of the firm. However, the magnitude of financing through retained earnings may be limited and variable primarily as a result of the quantum and variability of profits after tax. It has, moreover, high opportunity costs in terms of dividends foregone by the shareholders.

For the shareholders, retention of profits by the firm is a convenient way of reinvestment of their profit. But shareholders who want a current income would find it convenient to the extent that they will be compelled to sell some shares to convert them into income. Moreover, the easy availability of retained earnings coupled with the notion of low cost may result in its investment in submarginal/profitable projects which would have serious· implications for, and hurt the interest, of the shareholders.

Thus, retained earnings have both positive and negative attributes from the viewpoint of the firm as well as shareholders and should be employed with caution. They involve high cost and no risk, and put no restraint in management freedom and do not dilute control.

10.5 Preference Share Capital

Preference share capital represents a hybrid form of financing It has some characteristics of equity and some attributes of debentures. It resembles equity in the following ways: (i) preference dividend is payable only out of distributable profits; (ii) preference dividend is not an obligatory payment (the payment of preference dividend is entirely within the discretion of directors); and (.iii) preference dividend is not a tax-deductible payment.

Preference capital is similar to debentures in several ways: (i) the dividend rate of preference capital is usually fixed; (ii) the claim of preference shareholders is prior to the claim of equity shareholders; and (iii) preference shareholders do not normally enjoy the right to vote.

Preference capital offers the following advantages:

1. There is no legal obligation to pay preference dividend. A company does not face bankruptcy or legal action if it skips preference dividend.
2. There is no redemption liability in the case of perpetual preference shares. Even in the case of redeemable preference shares, redemption can be delayed without significant penalties.
3. Preference capital is generally regarded as a part of net worth. Hence, it enhances the creditworthiness of the firm.
4. Preference shares do not under normal circumstances, carry voting right. Hence, there is no dilution of control.

Preference capital, however, suffers from some serious shortcomings:

1. Compared to debt capital, it is an expensive source of financing because the dividend paid to preference shareholders is not, unlike debt interest, a tax-deductible expense.
2. Though there is no legal obligation to pay preference dividends, skipping them can adversely affect the image of the firm in the capital market.
3. Compared to equity shareholders, preference shareholders have a prior claim on the assets and earnings of the firm.

10.6 Debenture Capital

Akin to a promissory note, debentures/bonds represent creditors hip security and debenture holders are long-term creditors of the company. As a secured instrument, it is a promise to pay interest and repay principal at stipulated times. In contrast to equity capital which is a variable income security, the debentures are fixed income (interest) security.

Features of Debentures

As a long-term source of borrowing, debentures have some contracting features as compared to equities which are as follows:

1. **Trust Indenture**: When a debenture is sold to investing public, a trustee is appointed through an indenture trust deed. It is legal agreement between the issuing company and the trustee who is usually a financial institution/ bank/insurance company/firm of attorneys. The trust deed provides the specific terms of agreement such as description of debentures, rights of debenture holders, rights of the issuing company and responsibilities of the trustee. The trustee is responsible to ensure that the borrower/company fulfills all its contractual obligations.

2. **Interest**: The debentures carry a fixed (coupon) rate of interest, the payment of which is legally binding/enforceable. The debenture interest is tax-deductible and is payable annually/semi-annually/ quarterly. Some public sector undertakings issue tax-free bonds the income from which is exempted from tax in the hands of the investors. A company is free to choose the coupon rate which may be fixed or floated, being determined in relation to some benchmark rate. It is also related to the credit rating of the debenture as an instrument.

3. **Maturity**: It indicates the length of time for redemption of par value. A company can choose the maturity period, though the redemption period for non-convertible debenture is typically **7-10** years. The redemption of debentures can be accompanied in either of two ways : (i) debentures redemption reserve (sinking fund) and (ii) call and put (buy-back) provision.

4. **Debenture Redemption Reserve (DRR) :** A DRR has to be created for the redemption of all debentures with a maturity period exceeding 18 months equivalent to at the least 50 per cent of the amount of issue/redemption before commencement of redemption.

5. **Call and Put Provision:** The call/buy back provision provides an option to the issuing company to redeem the debentures at a specified price before maturity. The call price may be more than the part/face value by usually 5 per cent, the difference being call premium. The put option is a right to the debenture holder to seek redemption at specified time at predetermined prices.

6. **Security:** Debentures are generally secured by a charge on the present and future immovable assets of the company by way of an equitable mortgage.

7. **Convertibility:** Apart from pure non-convertible debentures (NCDs), debentures can also be converted into equity shares at the option of the debenture holders. The conversion ratio and the period during which conversion can be affected are specified at the time of the issue of the debenture itself. The convertible debentures may be fully convertible (FCDs) or partly convertible (PCDs). The FCDs carry interest rates lower than the normal rate on NCDs; they may even have a zero rate of interest. The PCDs have two parts: (a) convertible part, (b) non-convertible part. Typically, the convertible portion is converted into equity share at a specified premium after a specified date from the date of allotment, while the non-convertible portion is payable/redeemable in specified equal instalments on the expiry of specified years from the date of allotment.

8. **Credit Rating:** To ensure timely payment of interest and redemption of principal by a borrower, all debentures must be compulsorily rated by one or more of the credit rating agencies.

9. **Claim on Income and Assets:** The payment of interest and repayment of principal is a contractual obligation enforceable by law. Default would lead to bankruptcy of the company. The claim of debenture holders on income and assets ranks *paris passu* with other secured debt and higher than that of shareholders-preference as well as equity.

Types of Debentures

Debentures may be straight debentures or convertible debentures. A convertible debenture (CD) is one which can be converted, fully or partly, into shares after a specified period of time. Thus on the basis of convertibility, debentures may be classified into three categories:

(a) Non-convertible debentures (NCDs) : NCDs are pure debentures without a feature of conversion. They are repayable on maturity. The investor is entitled for interest and repayment of principal.

(b) Fully-convertible debentures (FCDs) : FCDs are converted into shares as per the terms of the issue with regard to price and time of conversion. The pure FCDs interest rates are generally less

than the interest rates on NCDs since they have the attraction feature of being converted into equity shares. Recently, companies in India are issuing FCDs with zero rate of interest.

(c) **Partly-convertible Debentures (PCDs)** : A number of debentures issued by companies in India have two parts: a convertible part and a non-convertible part. Such debentures are known as partly-convertible debentures (PCDs). The investor has the advantages of both convertible and non-convertible debentures blended into one debenture.

Pros and Cons

Debenture has a number of advantages as long-term source of finance:

Less costly: It involves less cost to the firm than the equity financing because (a) investors consider debentures as a relatively less risky investment alternative and therefore, require a lower rate of return and (b) interest payments are tax deductible.

Non ownership dilution: Debenture holders do not have voting rights; therefore, debenture issue do~s not cause dilution of ownership.

Fixed payment of interest :Debenture do not participate in extraordinary earnings of the company. Thus the payments are limited to interest.

Reduced real obligation: During periods of high inflation, debenture issue benefits the company. Its obligation of paying interest and principal which are fixed decline in real terms.

Deben"Lures has some of the following limitations also:

Obligatory payments: Debenture results in legal obligation of paying interest and principal, which, if not paid, can force the company into liquidation.

Financial risk: It increases the firm's financial leverage, which may be particularly disadvantageous to those firms which have fluctuating sales and earmngs.

Cash outflows: Debentures must be paid on maturity, and therefore, at some points, it involves substantial cash outflows.

Restricted covenants: Debenture indenture may contain restrictive covenants which may limit the company's operating flexibility in future.

10.7 Term Loans

Historically, term loans given by financial institutions and banks have been the primary source of long-term debt for private firms and most public firms. Term loans, also referred to as term finance, represent a source of debt finance which is generally repayable in less than 10 years. They are employed to finance acquisition of fixed assets and working capital margin. Term loans differ from short-term bank loans which are employed to finance short-term working capital need and tend to be self-liquidating over a period of time, usually less than one year. The features of term loans are discussed as follows:

1. **Currency** : Financial institutions give rupee loans as well as foreign currency term loans. The most significant form of assistance provided by financial institutions, rupee term loans are given directly to industrial concerns for setting up new project as well as for expansion, modernisation, and renovation projects. These funds are provided for incurring expenditure for land, building, plant and machinery, technical know-how, miscellaneous fixed assets, preliminary expenses, and margin money for working capital.

Financial institutions provide foreign currency term loans for meeting the foreign currency expenditure towards import of plant, machinery and equipment, and payment of foreign technical know-how fees. The periodical liability for interest and principal remains in the currency/currencies of the loan and is translated into rupees at the prevailing rate of exchange for making payments to the financial institutions.

2. Security:

Term loans typically represent secured borrowing. Usually assets which are financed with the proceeds of the term loan provide the prime security. Other assets of the finn may serve as collateral security.

All loans provided by financing institutions, along with interest, liquidated damages, commitment charges, expenses, etc. are secured by way of:

(a) First equitable mortgage of all immovable properties of the borrower, both present and future; and

(b) Hypothecation of all movable properties of the borrower, both present and future, subject to prior charges in favour of commercial banks for obtaining working capital advance in the normal course of business.

3. Interest Payment and Principal Repayment

The interest and principal repayment on term loans are definite obligations that are payable irrespective of the financial situation of the firm. To the general category of borrowers, financial institutions charge an interest rate that is related to the credit risk of the proposal, subject to usually a certain floor rate. Financial institutions impose a penalty for defaults.

Note that the interest burden declines over time, whereas the principal repayment remains constant. This means that the total debt servicing burden (consisting of interest payment and principal repayment) decline over time. This pattern of debt servicing burden, typical to India, differs from the pattern obtaining in western economies where debt is typically amortised to equal periodic instalments.

4. Restrictive Covenants

In order to project their interest, financial institutions generally impose restrictive conditions on the borrowers. While the specific set of restrictive covenants depends on the nature of the project and the financial situation of the borrower, loan contracts often require that the borrowing firm:

- Broad-base its board of directors and finalise its management set-up in consultation with and to the satisfaction of the financial institutions.
- Make arrangements to bring additional funds in the form of unsecured loans/deposits for meeting overruns/shortfalls.
- Refrain from undertaking any new project and/expansion or make any investment without the prior approval of the financial institutions.
- Obtain clearances and licences from various government agencies.
- Repay existing loans with the concurrence of financial institutions.
- Refrain from additional borrowings or seek the consent of financial institutions for additional borrowings.

- Reduce the proportion of debt in its capital structure by issuing additional equity and preference capital.
- Limit its dividend payment to a certain rate or seek the consent of financial institutions to declare dividend at a higher rate.
- Refrain from creating further charges on its assets.
- Provide periodic information about its operations.
- Limits the freedom of the promoters to dispose of their shareholding.
- Effect organisational changes and appoint suitable professional staff.
- Give financial institutions the right to appoint l)ominee directors.

Advantages and Disadvantages of Term Loans

Term loans and debentures are two important ways of raising long-term debt. The advantages of term loans are as follows:

1. Interest of term loan is a tax-deductible expense, whereas equity and preference dividend are paid out of profit after tax
2. Term loans do not result in dilution of control because debt-holders (term lending institutions and debenture-holders) are not entitled to vote.
3. Lending institutions do not particIpate in the value created by the company as payments to them are limited to interest and principal.

Term loan financing is not an unmixed blessing. It has serious disadvantages associated with it :

1. They entails fixed interest and principal repayment obligation. Failure to meet these commitments can cause a great deal of financial embarrassment and even lead to bankruptcy.
2. Loan increases financial leverage which, according to CAPM, raises the cost of equity to the firm.
3. Loan contracts impose restrictions that limit the borrowing firm's financial and operating flexibility. These restrictions may impair the borrowing firm's ability to resort to value-maximising behaviour.
4. If the rate of inflation turns out to the unexpectedly low, the real cost of borrowing will be greater than expected.

10.8 Warrants

A warrant entitles its holders to subscribe to the equity capital of a company during a specified period at a particular price. The holder acquires only the right (option) but he has no obligation to acquire the equity shares. Warrants are generally issued in conjunction with other instruments, for example, attached to (i) secured premium notes of TISCO in 1992, (ii) debentures of Deepak Fertilisers and Petrochemical Corporation Ltd. in 1987, Ranbaxy and Reliance in 1995. They can be issued independently also.

Difference with Convertible Debentures: Warrants are akin to convertible debentures to the extent that both give the holder the option/right to buy ordinary shares but there are differences between the two. While the debenture and conversion option are inseparable, a warrant can be detached. Similarly, conversion option is tied to the debenture but warrants can be offered independently also. Warrant are typically exercisable for cash.

Features: The important features of warrants are as follows:

1. **Exercise Price:** It is the price at which the holder of a warrant is entitled to acquire the ordinary shares of the firm. Generally, it is set higher than the market price of the shares at the time of the issue.

2. **Exercise Ratio:** It reflects the number of shares that can be acquired per warrant. Typically, the ratio is 1: I which implies that one equity share can be purchased for each warrant.

3. **Expiry Date:** It means the date after which the option to buy shares expires, that is, the life of the warrant. Usually, the life of warrants is 5-10 years although theoretically perpetual warrants can also be issued.

4. **Types** : Warrants can be, (i) detachable, and (ii) non-detachable. A detachable warrant can be sold separately in the sense that the holder can continue to retain the instrument to which the warrant was tied and at the same time sell it to take advantage of price increases.

5. **Theoretical Value:** A warrant is an option (call option) to buy a number of ordinary share (exercise ratio) at the exercise price. Therefore, the theoretical value of a warrant would depend upon market price of the shares of the company, the exercise price and the exercise ratio. Thus,

   Theoretical value = (Market share price - Exercise price) x Exercise ratio

Assuming an exercise price of Rs. 75, the expected market price of share of the company at the time of exercise for the option (expiry date) ofRs. 100 and exercise ratio of 2, theoretical value of a warrant = (Rs 100 - Rs. 75)x2=Rs. 50.

If the market value of shares is lower than the exercise price, the value of a warrant would be zero.

The difference between the market value of shares and the theoretical value of the warrant is the premium. The premium divided by the theoretical value expresses premium in percentage terms.

10.9 Zero Interest Bonds/Debentures

Also known as zero coupon bonds, ZIBs do not carry any explicit rate of interest. They are sold at a discount from their maturity; value. The difference between the face value of the bond and the acquisition cost is the return to the investors. The implicit rate of return/interest on such bonds can be computed as follows:

Acquisition price = Maturity (face) value/$(l\text{-}i)^n$

Where i = rate of interest

n = maturity period (years)

Deep Discount Bond (DDB) : A deep discount bond is a form of ZIB. It is issued at a deep/ steep discount over its face value. It implies that the interest (coupon) rate is far less than the yield to maturity. The DDB appreciates to its face value over the maturity period.

The DDBs are being issued by the public financial institutions in India, namely, IDBI, SIDBI and so on. For instance, IBDI sold in 1992 a DDB of face value ofRs. 1 1akh at a deep discount price ofRs. 2,700 with a maturity period of 25 years. If the investor could hold the DDB for 25 years, the annualised rate of return would work out to 15.54 per cent. The investor had the option to withdraw (put option) at the end of every five years with a specified maturity/deemed face value ranging between Rs. 5,700 (after 5 years) and Rs. 50000 (after 20 years), the implicit annual rate of interest being 16.12 and 15.71 per cent

respectively. The investors could also sell the DDBs in the market. The IDBI had also the option to redeem them (call option) at the end of every 5 years presumably to take advantage of prevailing interest rates. A second series of DDBs was issued by the IDBI in 1996 with a face value ofRs. 2 lakh and a maturity period of 25 years, the deep discount issue price being Rs. 5,300.

The merit of DDBs/ZIDs is the that they enable the issuing companies to conserve cash during their maturity. They protect the investors against the reinvestment risk to the extent the implicit interest on such bonds is automatically reinvested at a rate equal to its yield to maturity. However, they are exposed to high repayment risk as they entail a balloon payment on maturity.

10.10 Summary

Equity and debt represent the two broad sources of finance for a business firm. Ordinary shares provide ownership rights to ordinary shareholders. They are the legal owners of the company. As a result, they have residual claims on income and assets of the company. They have the right to elect the board of directors and maintain their proportionate ownership in the company, called the pre-emptive right. The pre-emptive right of the orginary shareholders is maintained by raising new equity funds through rights offerings. Rights issue does not affect the wealth of a shareholder.

Debenture or bond is a long-term promissory note. Debenture holders have a prior claim on the company's income and assets. They will be paid before shareholders are paid anything. Debentures could be secured and unsecured and convertible and non-convertible. Debentures are issued with a maturity date. In India, they are generally retired after 7 to 10 years by instalments.

Preference share is a hybrid security as it includes some features of both an ordinary share and a debenture. In regard to claims on income and assets, it stands before an ordinary share but after a debenture. Term loans are loans for more than a year maturity. Generally, in India, they are available for a period of 6 to 10 years. In some cases, the maturity could be as long as 25 years. Iriterest on term loans is tax deductible. Mostly, term loans are secured through an equitable mortgage on immovable assets. To protect their interest, lending institutions impose a number of restrictions on the borrowing firm.

A warrant is an option to buy a specified number of ordinary shares at an indicated price during a specified period. A detachable warrant is bought and sold independent of the debenture to which it is associated.

A company may also issue zero-interest or deep-discount bonds or debentures. Such debentures are issued at a price much lower than their face value. Thus, there is an implicit rate of interest. A company may also issue debentures redeemable at premium and/or with warrants attached. These features are added to make the issue of debentures attractive to the investors.

10.11 Key Words

- **Right Issue:** It involves selling of ordinary shares to the exiting shareholders of the company.
- **Warrant:** A warrant entities its holder to subscribe to the equity capital of a company during a specified period at a particular price.
- **Equity Shares:** They represent the ownership position in a company and its owners share the risk and rewards associated with the ownership of compames.
- **Public Issue:** It means raising the capital directly from the public.
- **Preference Share Capital:** It represents a hybrid form of financing having some characteristics of equity and some attributes of debentures.

10.12 Self Assessment Test

1. What is an equity share? How does it differ from a preference share and a debenture? Explain its most important features.
2. What are the advantages and disadvantages of equity shares to the company? What are the merits and demerits of the shareholders' residual claim on income from the investors' point of view?
3. What is a rights issue? What are its advantages and disadvantages from the company's and shareholders' points of view?
4. What is a debenture? Explain the features of a debenture.
5. What are the pros and cons of debentures from the company's and investors' point of views?
6. Why is a preference share called a hybrid security? Do you agree that it combines the features of ordinary shares and bonds?
7. What are term loans? What are their features?

UNIT - 11 : TIME VALUE OF MONEY

Unit Structure

11.0 Objectives

After reading this unit, the learners will be able:

- To understand the concept of time value of money
- To know the meaning of compound value and present value.
- To understood the applications of compound value of annuity and present value of annuity.

11.1 Introduction

Most financial decisions involve cash flow occurring at different time period. For example, if a firm borrows funds from a bank or from any source, it receives cash now and commits an obligation to pay interest and repay principal in future periods. The firm may also raise funds by issuing equity shares. The firm's cash balance will increase at the time shares are issued, but, as the firm pays dividends in future, the outflow of cash will occur. Sound decision-making requires that the cash flow which a firm is expected to five up over period should be logically comparable. The absolute cash flows which differ in timing and risk are not directly comparable. Cash flows become logically comparable when they are appropriately adjusted for their differences in timing and risk. The understanding and recognizing the time value of money and risk is extremely vital in financial decision-making to attain its objectives of maximizing the owner's welfare. The welfare of owner would be maximized when net wealth or net present value is created from making a financial decision. The net present value is s time value concept. Let us now understand the concept of time value of money.

11.2 Meaning of Time Value of Money

Money has time value. a rupee today is more valuable than a rupee a year hence. In fact, if an individual behaves rationally, he would not value the opportunity to receive a specific amount of money now equally with the opportunity to have the same amount at some future date. Most individuals value the opportunity to receive money now higher than waiting for one or more years to receive the same amount. This phenomenon is referred to as an individual's time preference for money. Thus, an individual's preference for possession of a given amount of cash now, rather than the same amount at some future time, is called time value of money.

There are several reasons for time value for money:

- Generally, individuals prefer current consumption to future consumption.
- Capital can be employed productively to generate positive returns. An investment of one rupee

today would grow to (1 + r) a year hence (r is the rate of return earned on the investment).

- In an inflationary period a rupee today represents a greater real purchasing power than rupee a year hence.

As an individual is not certain about future cash receipts, he prefers receiving cash now. Most people have subjective preference for present consumption over future consumption of goods and services either because of the urgency of their present wants or because of the risk of not being in a position to enjoy future consumption that may be caused by illness or death, or because of inflation. As money is the means by which individuals acquires most goods and services, they may prefer to have money now. Further, most individuals prefer present cash to future cash because of the available investment opportunities to which they can put present cash to earn additional cash. For example, an individual who is offered Rs. 200 now or Rs. 200 one year from now would prefer Rs. 200 now if he could earn on it an interest of, say Rs. 10 by putting it in the saving account in a bank for one year. His total cash in one year from now will be Rs. 210. Thus, if he wishes to increase his cash resources, the opportunity to earn interest would lead him to prefer Rs. 200 now, not Rs. 200 after one year.

11.3 Time Preference Rate and Required Rate of Return

The time value for money is generally expressed by an interest rate. This rate will be positive even in the absence of any risk. It may be therefore called the risk-free rate. For instance, if time preference rate is 4 per cent, it implies that an investor can forgo the opportunities of receiving Rs. 100 if he offered Rs. 104 after one year (i.e. Rs. 100 which he would received now plus the interest which he could earn in a year by investing Rs. 100 and Rs. 104 a year from now as he consider these two amounts equivalent in value. In reality, an investor will be exposed to some degree of risk. Therefore, he would require a rate of return for the investment, which compensates him for both time and risk. His required rate of return will be.

Required rate of return = Risk-free rate + risk premium

The *risk-free* rate compensates for time while *risk premium compensates* for risk. The required rate of return may also be called *the opportunity cost of capital* of comparable risk. It is called so because the investor could incest his money in assets or securities of equivalent risk. Like individuals, firms also have required rate of return and use them in evaluating the desirability of alternative financial decisions. The interest rates account for the time value of money, irrespective of an individual's preference and attitudes.

How does knowledge of the required rate of return or simply the interest rate help an individual or a firm in making investment decision? It helps the individual or the firm to convert different amounts offered at different times to amounts of equivalent value in the present, a common point of reference. For example, let us assume an individual with an interest rate of 10 per cent. If he is offered Rs. 115.50 one-year from now in exchange for Rs. 100, which he should give up today, should he accept the offer? The answer is this particular case is that he should he accept the offer. When his interest rate is 10 per cent, this implies that he is different between any amount today and 100 per cent of the amount (i.e. more than Rs. 110 in the example) one year from now.

11.4 Compound Value

Interest is compounded when the amount earned in an initial deposit (the initial principal) becomes part of the principal at the end of the first compounding period. The term principal refers to the amount of money on which interest is received.

EXAMPLE 1:

Suppose you invest Rs. 1,000 for three years in a savings account that pays 10 per cent interest

per year. If you let your interest income be reinvested, your investment will grow as follows:

First year	:	Principal at the beginning	1,000
		Interest for the year (Rs. 1,000 x 0.10)	100
		Principal at the end	1,100
Second year	:	Principal at the beginning	1,100
		Interest for the year (Rs. 1,100 x 0.10)	110
		Principal at the end	1,210
Third year	:	Principal at the beginning	1,210
		Interest for the year (Rs. 1,210 x 0.10)	121
		Principal at the end	1,331

FORMULA

The process of investing money as well as reinvesting the interest earned thereon is called compounding. The future value or compounded value of an investment after n years when the interest rate is r percent is:

$$FV = PV (1+r)^n \quad \text{.....} \quad (1)$$

In which FV_n = the future or compound value

PV = Present value

r = rate of interest

n = number of years

$(1+r)^n$ = the futher value interest factors

To solve future value problems you have to find value factors. You can do it in different ways. In the example given above, you can multiply 1.10 by itself three times or more generally (1 + r) by itself n times. This becomes tedious when the period of investment is long.

Fortunately, you have an easy way to get the future value factors. Most calculators have a key labelled "y^x". So all that you have to do is to enter 1.10, press the key labelled y^x, enter 3, and press the "=" key to obtain the answer.

Alternatively, you can consult a future value interest factor (FVIF) table. One such table showing the future value factor for certain combinations of periods and interest rates is given in Appendix A at the end of majority of the books.

EXAMPLE 2:

Suppose Mr. Ram deposits Rs. 1,000 today in a bank, which pays 10 per cent interest, compounded annually, how much will the deposit grow to after 8 years and 12 years?

The future value, 8 years hence, will be:

Rs. 1,000 $(1.10)^8$ = Rs. 1,000 (2.144)

= Rs. 2,144

The future value, 12 years hence, will be:

Rs. 1,000 $(1.10)^{12}$ = Rs. 1,000 (3.138)

= Rs. 3,138

Compound and simple interest

So far we assumed that money is invested at compound interest, which means that each interest payment is reinvested to earn further periods. By contrast, if no interest is earned on interest the investment earns only simple interest. In such a case the investment grows as follows:

Future value= present value [1 + Number of years x Interest rate]

EXAMPLE 3:

An investment of Rs. 2,000, if invested at 12 per cent simple interest rate will in 5 years time become:

2,000 [1 + 5 x 0.12] = Rs. 3,200

Semi-annual and other compounding periods: In the foregoing discussion we have assumed annual compounding of interest at the end of the year. Very often the interest rates are compounded more than once in a year. Savings institutions, particularly, compounded interests semi annually, quarterly and even monthly.

In case of semi-annual compounding there would be two compounding periods within the year. Interest is actually paid every six months at a rate of one-half of the annual (stated) rate of interest.

EXAMPLE 4:

Assume Mr. Investor places his savings of Rs. 1,000 in a two-year time deposit scheme of a bank, which yields 6 per cent interest, compounded semi-annually. He will be paid 3 per cent interest compounded over four periods-each of six months duration. Table presents the calculations of the amount Mr. Investor will have the time deposit after two year.

Table 1: Semi-annual compounding

Year	6 months	1 year	18 months	2 year
Beginning amount	Rs. 1, 000.00	Rs. 1, 030.00	Rs. 1, 060.90	Rs. 1,092.73
Interest rate	0.03	0.03	0.03	0.03
Amount of interest	30.0	30.90	31.83	32.78
Beginning principal	1, 000.00	1, 030.00	1, 060.90	1,092.73
Ending principal	1, 030.00	1, 060.90	1, 092.73	1,125.51

Table 4.1 reveals that his savings will amount to Rs.1, 060.90 and Rs. 1,125.51 respectively at the end of the first and second years.

Quarterly compounding means that there are four compounding periods within the year. Instead of paying the interest once a year, it is paid in four equal installments after every three months. Using the above illustration, there will be eight compounding periods and the rate of interest for each compounding period

will be 1.5 per cent, that is (1/4 of 6 percent).

The effect of compounding more than once a year can also be expressed in the form of a formula; Equation 1 can be modified as Eq. 2.

$$P\{1+\frac{r}{m}\}^{mn}=A \qquad (2)$$

Here, m is the number of times per year compounding is made. For semi-annual compounding, m would be 2, while for quarterly compounding it would equal 4 and if interest is compounded monthly, weekly and daily, it would equal 12, 52 and 365 respectively.

The general applicability of the formula can be shown as follows, assuming the same figures of Mr. Investor's savings of Rs. 1,000:

1. For semi-annual compounding.

$$\text{Rs. } 1000\{1+\frac{0.06}{2}\}^{2x2}=\text{Rs. } 1000(1+0.03)^4=1125.51$$

2. For quarterly compounding:

$$\text{Rs. } 1000\{1+\frac{0.06}{4}\}^{4x2}=\text{Rs. } 1000(1+0.15)8=1126.49$$

Compounded value of a series of payments:

So far we have considered only the future value of a single payment made at time zero. In many instances, we may be interested in the future value of a series of payments made at different time periods. For simplicity, we assume that the compounding time period is one year and payment is made at the end of each year. Suppose, Mr. X deposits each year Rs. 1,000, Rs. 2,000, Rs. 3,000, Rs. 4,000 and Rs. 5000 in his saving bank account for 5 years. The interest rte is 5 per cent. He wishes to find the future value of his deposits at the end of the 5th year. Since the deposits are made at the end of the year, the first deposit will earn interest for four years, the second deposit for three years and so on. The last payment of Rs. 5,000. The future value of the entire stream of payments is the sum of the individual future values, that is Rs. 16,041. Table 4.2 presents the calculations required to determine the sum of money he will have.

Table 2: Annual compounding of a series of payments

End of year	Amount deposited	Number of years compounded	Compounded interest factor from Table A	Future value (2) x (4)
1	2	3	4	5
1	1000	4	1.216	1216.00
2	2000	3	1.158	2316.00
3	3000	2	1.109	3309.00
4	4000	1	1.050	4200.00
5	5000	0	1.000	5000.00
				16041.00

Compound value of an Annuity:

An annuity is a fixed payment (or receipts) each year for a specified number of years. If you rent a flat and promise to make a series of payments over an agreed period, you have created an annuity. The equal installment loans from the house financing companies or employers are common example of annuities. The

compound value of an annuity cannot be computed directly from Equation (2). Let us illustrate the computation of the compound value of an annuity.

EXAMPLE 5

Assume a constant sum of Rs. 1 is deposited in a savings account at the end of each year for four years at 6 per cent interest. This implies that Rs. 1 deposited at the end of the first year will grow for 3 years, Rs. 1 at the end of second year for 2 years, Rs. 1 at the end of the third year for 1 year and Rs. 1 at the end of fourth year will not yield any interest. Using the concept of the compound value of a lump sum, we can compute the value of annuity. The compound value of Rs. 1 deposited in the first year will be: Rs. $1\ (1+0.06)^3$= Rs. 1.191, that of Rs. 1 deposited in the second year will be: Rs. $1\ (1+0.06)^2$ = Rs. 1.124 and Rs. 1 deposited at the end of third year will grow to: Rs. $1\ (1+0.06)^1$ = Rs. 1.06 and Rs. 1 deposited at the end of fourth year will remain Rs 1. The aggregate compound value of Rs.1 at the end of each year for four years be: Rs. 1.191 + Rs. 1.124 + Rs. 1.060 + Rs 1.00 = Rs. 4.375. This is the compound value of an annuity of Rs. 1 for four years at 6 per cent rate of interest.

The above computations can be expressed as follows:

$$FV_4=A(1+r)^3+A(1+r)^2+A(1+r)+A$$

$$FV_4=A[(1+r)^3+(1+r)^2+(1+r)+1] \qquad (3)$$

Where A is the annuity. We can extend the Equation (3) for n periods and rewrite it as follows:

$$FV_n = A\left[\frac{(1+r)^n - 1}{r}\right] \qquad (4)$$

The term within brackets is the compound value factor for an annuity of Re. 1. Which we shall refer as CAVF.

Suppose Rs. 1,000 are deposited at the end of each of the next three years at 10 per cent interest rate. The compound value employing Equation (4) is:

$$FV=RS.1000\left[\frac{(1.10)^3 - 1}{0.10}\right] = Rs.1000 \times 3.31=Rs.3310$$

It would be quite difficult to solve Equation (4) manually if n is very large. Our calculations can be facilitated by either using a calculator or precalculated compound values of an annuity pf Re. 1 Table B at the end of the book gives compound value factors for an annuity Re. 1 for various combinations of time period (n) and rates of interest (r). This table is constructed under the assumption that the funds are deposited at the end of a period. The compound value factor of an annuity (CVAF) should be ascertained from the table to find out the future value of the annuity. We can also write Equation (4) as follows:

$$FV = A\ (CVAF\text{-}_{n.i}) \qquad (5)$$

Where $CVAF\text{-}_{n.i}$ is the compound value factor of an annuity for n period at I rate of interest?

EXAMPLE 6

Suppose that a firm deposits Rs. 5,000 at the end of each year for four years at 6 per cent rate of interest. How much would this annuity accumulate at the end of the fourth year? From Table B, we find that

fourth row and 6 per cent column give us a CVAF of 4.375. if we multiply 4.375 by Rs. 5, 000, we obtain a compound value of Rs. 21, 875.

$$\text{FV=Rs. } 5000\left(\text{CVAF}_{4,0.06}\right)=\text{ Rs. } 5000' \text{ } 4.375=\text{Rs.}23{,}875$$

Applications of the compound value of annuity:

The future value annuity can be applied in a variety of context. Its important applications are illustrated below.

1. Calculating the future value

EXAMPLE 7:

Suppose you have decided to deposited Rs. 30, 000 per year in your public provident fund account for 30 years. What will be the accumulated amount in your public provident fund at the end of 30 years if the interest rate is 11 per cent?

The accumulated will be:

$$\begin{aligned} & Rs.30,000\,(FVIFA_{11\%,30\,yrs}) \\ &= Rs.30,000\left[\frac{(1.11)^{30-1}}{.11}\right] \\ &= Rs.30,000[199.02] \\ &= Rs.5,970,600 \end{aligned}$$

2. Decoding the amount of annual savings

You want to buy a house after 5 years when it is expected to cost Rs. 4 million. How much should you save annually if your savings earn a compound return of 12 per cent?
The future value interest factor for a % year annuity, given an interest rate of 12 per cent, is:

$$FAIFA_{n=5,r=12\%)=(1+0.12)^{5-1}}=6.353$$

The annual savings should be:

$$\frac{\text{Rs.}4000,000}{6.353}=\text{Rs.}6,29,624$$

$$\text{FAIFAn}=6,\ \text{r}=14\%=\frac{(1+0.14)^{6-1}}{0.14}=8.536$$

The annual sinking fund deposit should be:

$$\frac{Rs.100\,million}{8.536}=Rs.11.75$$

3. Finding the interest rate:

EXAMPLE 9:

A finance company advertises that it will pay a lump sum of Rs. 16, 000 at the end of 6 years to investors who deposit annually Rs. 2, 000 for 6 years. What interest rate is implicit in this offer?

The interest rate may be calculated in two steps:

1. Find the $FAIVA_{r,6}$ for this contract as follows:

$$Rs.16,000 = Rs.2,000 \times FAIVA_{r,6}$$

$$FAIVA_{r,6} = \frac{Rs.16,000}{Rs.20,000} = 8,000$$

2. Look at the $FAIVA_{r,n}$ table and read the row corresponding to 6 years until you find a value close to 8, 000. Doing so, we find that

$$FAIVA_{12\%,6} \; is \; 8.115$$

Hence, the interest rate is slightly below 12 per cent.

4. Deciding waiting period

EXAMPLE 10:

You want to take up a trip to the moon which costs Rs. 1, 000, 000 – the cost is expected to remain unchanged in nominal terms. You can save annually Rs. 50, 000 to fulfill your desire. How long will you have to wait if your savings earn an interest of 12 per cent?

The future value of an annuity of Rs. 50, 000 that earns 12 per cent is equated to Rs. 1, 000, 000.

$$50,000 \times FAIVA_{n=?,12\%} = 1,000,000$$

$$50,000 \times \left[\frac{1.12^n - 1}{0.12}\right] = 1,000,000$$

$$1.12^n - 1 = \frac{1,000,000}{Rs.50,000} \times 0.12 = 2.4$$

$$1.12^n = 2.4 + 1 = 3.4$$

$$n \; \log 1.12 \log 3.4$$

$$n \times 0.0492 = 0.5315$$

$$n = \frac{0.5315}{0.0492} = 10.8 \, years$$

You will have to wait for 10.8 years.

11.5 Present Value

The concept of the present value is the exact opposite of that of compound value. While in the latter approach money invested now appreciates in value because compound interest is added, in the former approach (present value approach) money is received at some future date and will be worth less because the corresponding interest is lost during the period. In other words, the present value of a rupee

that will be received in the future will be less than the value of a rupee in hand today. Thus, in contrast to the compounding approach where we convert present sums into future sums, in present value approach future sums are converted into present sums. Given a positive rate of interest, the present value of future rupees will always be lower. It is for this reason, therefore, that the procedure of finding present values is commonly called discounting. It is concerned with determining the present value of a future amount, assuming that the decision maker has an opportunity to earn a certain return on his money. This return is designated in financial literature as the *discount* rate, the *cost of capital* or an *opportunity cost.*

Mathematical formula:

The process of discounting, used for calculating the present value, is simply the inverse of compounding. The present value formula can be readily obtained by manipulating the compounding formula:

$$FV_n = PV\,(1+r)^n \qquad \textbf{(6)}$$

Dividing both the sides of Eq. (6) by $(1+r)^n$, we get:

$$\frac{1000}{100} FV_n [1/(1+r)^n] \qquad \textbf{(7)}$$

The factor $1/(1+r)^n$ in Eq. (7) is called the discounting factor or the present value interest factor $(PVIF_{r,n})$**.** Table C which is available in the end of this book gives the value of $PVIF_{r,n}$ for several combinations of r and n.

EXAMPLE 11:

What is the value of Rs. 2, 000 receivable 6 years hence if the discount is 10 per cent?

The present value is:

Rs. 2, 000 X $PVIF_{10\%,6}$ = Rs. 2, 000 (0.5645) = Rs. 1129.0

Present value of an uneven series

In financial analysis we often come across uneven cash flow streams. For example, the cash flow stream associated with a capital investment project is typically uneven. Likewise, the dividend stream associated with an equity share is usually uneven and perhaps growing.

The present value of a cash flow stream – uneven or even – may be calculated with the help of the following formula:

$$PV_n = \frac{A_1}{(1+r)} + \frac{A_2}{(1+r)^2} + +.....+ \frac{A_n}{(1+r)^n} + \sum_{t=1}^{n} \frac{A_t}{(1+r)^t} \qquad \textbf{(8)}$$

Where PV_{zn} = present value of a cash flow stream

A_t = cash flow occurring at the end of year r

k = discount rate

n = duration of the cash flow stream

Show the calculation of the present value of an uneven cash flow stream given in the following table, using a discount rate of 12 per cent:

Year	Cash flows
1	Rs. 500
2	1, 000
3	1, 500
4	2, 000
5	2, 500

In order to solve this problem, the present value of each individual cash flow discounted at 10 per cent for the appropriate number of years is to be determined. The sum of all these individual values is then calculated to get the present value of the total stream. The results are summarized in Table 4.3

Table 3: Present value of a MIXED stream of cash flows:

Year end	**Cash flows**	**Present value factor (2) X (3)**	**Present value**
1	2	3	4
1	Rs. 500	0.909	Rs. 454.50
2	1, 000	0.826	826.00
3	1, 500	0.751	1, 126.00
4	2, 000	0.683	1, 366.00
5	2, 500	0.621	1, 552.50
			5, 325.50

Present value of an Annuity

An investor may have an opportunity to receive a constant periodic amount (an annuity) for a certain number of years. The present value of an annuity cannot be found out by using Equation (6). We will have to find out the present value of the amount every year and will have to aggregate all the present values to get the total present value of the annuity. For example, an investor, who has a required interest rate as 10 per cent, may have an opportunity to receive an annuity of Re. 1 for four years. The present value of Re. 1 received after one year is, P = 1/(1.10)= Re 0.909, after two years, $P = 1/(1.10)^2$ = Re 0.826, after three years, $P = 1/(1.10)^3$ = Re. 0.751 and after four years, $P = 1/(1.10)^4$ = Re 0.683. Thus the total present value of annuity of Re 1 is Rs. 3.169:

$$PV = \frac{1}{(1.10)} + \frac{1}{(1.10)^2} + \frac{1}{(1.10)^3} + \frac{1}{(1.10)^4}$$

= 0.909 + 0.826 + 0.751 + 0.683 Rs. 3.169

If Re 1 had received as a lump sum at the end of the fourth year, the present value would be only Re 0.683. Notice that the present value of factors of Re 1 after one, two, three and four years and so on can be ascertained and when they are aggregated we obtain the present value of the annuity of Re. 1. The present value of an annuity of Re. 1 doe four years at 10 per cent interest rate is shown in figure 4.1. It can be noticed that the present value declines over period for a given discount rate.

The computation of the present value of ab annuity can be written in the following general form:

$$PV_{zn} = \frac{A}{(1+r)} + \frac{A}{(1+r)^2} + \frac{A}{(1+r)^3} + \ldots\ldots\ldots + \frac{A}{(1+r)^n}$$

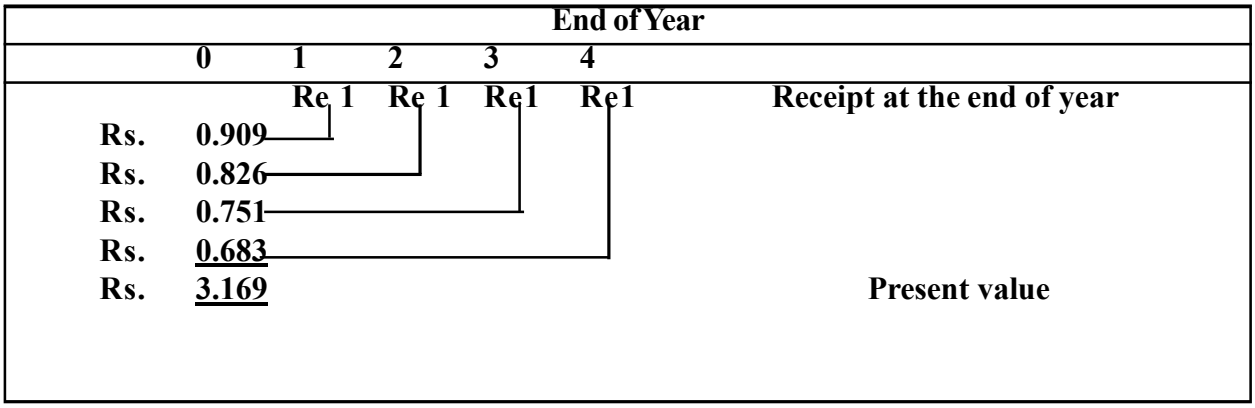
$$= \left[\frac{1}{(1+r)} + \frac{1}{(1+r)^2} + \frac{1}{(1+r)^3} + \ldots\ldots\ldots + \frac{1}{(1+r)^n} \right] \qquad \textbf{(9)}$$

Where A is a constant payment (or receipts) each year. Equation (9) can be solved and expressed as follows:

$$\text{PV} = \text{A} \left[\frac{(\text{i}+\text{r})^{\text{n}} - 1}{\text{i}(1+\text{r})^{\text{n}}} \right]$$

$$\text{PV} = \text{A} \left[\frac{(\text{i}+\text{r})^{\text{n}} - 1}{\text{i}(1+\text{r})^{\text{n}}} \right]$$

$$\text{P} = \text{A} \left[\frac{1}{\text{r}} - \frac{1}{\text{i}(1+\text{r})^{\text{n}}} \right]$$



Graphic representation of present value of an annuity of Re 1 at 10 % The term within parentheses of Equation (10) is the present value factor of an annuity of Re.1, which we will call PVAF, and it is a sum of single-payment present value factors.

To illustrate, let us suppose that a person receives an annuity of Rs. 5, 000 for four years. If the rate interest is 10 per cent, the present value of Rs. 5, 000 annuity is:

$$\text{PV} = Rs.5,000 \left[\frac{1 - \frac{1}{(1+10)^4}}{\text{i}} \right] = Rs.5,000 \times 3.170 = Rs.15,850$$

It can be realized that the present value calculations of an annuity for a long period would be extremely cumbersome. Our calculations are, however, simplified when we use calculator or the precalculated present values of an annuity of Re. 1. To calculate the present value of an annuity, we should simply find out the appropriate factor from Table D given in the books and multiply it by the annuity value. In our example, the value 3.170 solved using Equation (9) could be ascertained directly from Table D. reading fourth row and 10 per cent column, the value is 3.170. Equation (10) can also be written as follows:

$$PV = A(PVAF_{n,r})$$

Where $PVAF_{n,r}$ is the present value of an annuity of Re. 1 for n periods at r rate of interest? Applying the formula and using Table D, we get:

$$PV = Rs.5,000(PVAF_{4,0.10}) = Rs.5,000 \times 3.170 = Rs.15,850$$

Applications of the present value of annuity

The present value annuity formula can be applied in the following contexts:

1. How much you can borrow for a car:

After reviewing your budget, you have determined that you can afford to pay Rs. 12, 000 per month for 3 years towards a new car. You call a finance company and learn that the going rate of interest on car finance is 1.5 per cent per month for 36 months. How much can you borrow?

To determine how much you can borrow, we have to calculate the present value of Rs. 12, 000 per month for 36 months at 1.5 per cent per month.

Since the loan payments are an ordinary annuity, the present value interest factor of annuity is:

$$PVAF_{r,n} = \frac{(1+r)^n - 1}{r(1+r)^n} = \frac{(1+.015)^{36} - 1}{.015(1+.015)^{36}} = \frac{1.7091 - 1}{0.0256} = 27.70$$

Hence the present value of 36 payments of Rs. 12,00 each is :

Present value = Rs. 12, 000 X 27.70 = Rs. 332, 400

You can, therefore, borrow Rs. 332, 400 to buy a car.

2. Period of loan amortization:

Suppose you want to borrow Rs. 1, 080, 000 to buy a flat. You approach a housing company which charges 12.5 per cent interest. You can pay Rs. 180, 000 per year towards loan amortization. What should be the maturity period of the loan?

The present value of annuity of Rs. 180, 000 is set equal to Rs. 1, 080, 000.

$$180,000 \times PVAF_{n,r} = 1,080,000$$

$$180,000 \times PVAF_{n=?,r=12.5\%} = 1,080,000$$

$$180,000\left[\frac{1.125^n - 1}{0.0125 \times 1.125^n}\right] = 1,080,000$$

Given this equality the value of n is calculated as follows:

$$\frac{1.125^n - 1}{0.125 \times 1.125^n} = \frac{1,080,000}{180,000} = 6$$

$$1.125^n - 1 = 6(0.125 \times 1.125^n) = 0.75 \times 1.125^n$$

$$0.25 \times 1.125^n = 1$$

$$1.125^n = 4$$

$$n \log 1.125 = \log 4$$

$$n \times 0.0512 = 0.602$$

$$n = \frac{0.6021}{0.0512} = 11.76 \, years$$

You can perhaps request for a maturity of 12 years.

3. Determining the loan amortization schedule:

Most loans are repaid in equal periodic installments (monthly, quarterly, or annually), which cover interest as well as principal repayment. Such loans are referred to as amortized loans.

For an amortized loan we would like to know (a) the periodic installment payment and (b) the loan amortization schedule showing the break up of the periodic installment payments between the interest component and the principal repayment component. To illustrate how these are calculated, let us look an example.

Suppose a firm borrows Rs. 1, 000, 000 at an interest rate of 15 per cent and the loan is to be repaid in 5 equal installments payable at the end of each of the next 5 years. The annual installment payment A is obtained by solving the following equations.

$$Loan\ amount = A + PVIFa_{n=5,\ r=15}$$

$$1,000,000 = A \times 3.3532$$

$$Hence\ A = 298,223$$

The amortization schedule in table 4. The interest component is the largest for year 1 and progressively declines as the outstanding loan amount decreases

Table 4 : Loan amortization schedule

Year	**Beginning amount (1)**	**Annual installment (2)**	**Interest (3)**	**Principal repayment (2)-(3)=(4)**	**Remaining balance (1)-(4)=(5)**
1	**1, 000, 000**	**298, 329**	**150, 000**	**148, 329**	**851, 671**
2	**851, 671**	**298, 329**	**127, 751**	**170, 578**	**681, 093**
3	**681, 093**	**298, 329**	**102, 164**	**196, 165**	**484, 928**
4	**484, 928**	**298, 329**	**72, 739**	**225, 590**	**259, 338**
5	**259, 338**	**298, 329**	**38, 901**	**259, 428**	**- 90***

Year end	Amount of salary (Rs.)	PVF @ 12%	PV of salary (Rs.)
1	2, 000	0.893	1786
2	2, 200	0.797	1754
3	2, 410	0.712	1724
4	2, 662	0.636	1694
5	2, 928	0.567	1660
	12, 210		**8618**

a. Interest is calculated by multiplying the beginning loan balance by the interest rate.

b. Principal repayment is equal to annual installment minus interest.

* Due to rounding off error a small amount is shown.

Present value of a perpetuity

Perpetuity is an annuity that occurs indefinitely. Perpetuities are not very common in financial decision-making. But one can find a few examples. For instance, in the case of irredeemable preference shares (i.e. preference shares without a maturity), the company is expected to pay preference dividend perpetually. By definition, in perpetuity, time period, n, is so large (mathematically n approaches infinity) that the expression (**equation**) in Equation (10) tends to become zero, and the formula for a perpetuity simply becomes:

$$P = \frac{A}{r}$$

Let us assume that an investor expects a perpetual sum of Rs. 500 annually from his investment. What is the present value of this perpetuity if his interest rate is 10 per cent? Applying Equation (11), we get:

$$P = \frac{Rs.500}{0.10} = Rs.5,000$$

Present value of a growing annuity

In financial decision-making there are number of situations where cash flows may grow at a compound rate. For example, in the case of companies dividends are expected to grow at a compound rate. Assume that to finance your studies in an evening college, you undertake a part-time job for 5 years. Your employer fixes an annual salary of Rs. 2000 with the provision that you will get annual increment at the rate of 10 per cent. It means that you shall get the following amounts from year 1 through year 5.

Year End	**Amount of Salary (Rs.)**	
1	2,000	= 1, 000
2	2,000 (1.10) = 1,2000	= 2,200
3	2,200 (1.10) = 2,000(1.10)^2	= 2,420
4	2,420 (1.10) = 1,000(1.10)^3	= 2,662
5	2,662 (1.10) = 1,000(1.10)^4	= 2,928

If your required rate of return is 12 per cent, the present value of your salary is calculated as follows:

We can write formula for calculating the present value as follows:

$$PV = \frac{A_i}{(1+i)} + \frac{A_2}{(1+i)^2} + \frac{A_3}{(1+i)^3} + \ldots\ldots \frac{A_n}{(1+i)^n}$$

$$= \left[\frac{A_i(1+g)^0}{(1+i)} + \frac{A_1(1+g)^1}{(1+i)^2} + \frac{A_1(1+g)^2}{(1+i)^3} + \ldots\ldots \frac{A_1(1+g)^n}{(1+i)^n} \right] \quad (12)$$

Where is the rate of growth of cash flows? We know that for calculating the present value of a non-growing annuity, we can use equation (10) or equation (11). With an adjustment in the discount rate for growth, we can use the same procedure for calculating the present value of cash flows growing at constant rate.

If equation (10) is modified to incorporate growth in cash flows, it can be rewritten as follows:

$$PV = \frac{A}{1+g}\left[\frac{1-(1+i^*)-n}{i^*}\right] \qquad (13)$$

Note that I* is the required rate if interest adjusted for growth. It can be found as follows:

$$i^* = \frac{i-g}{1+g}$$

If we use the data of the example above, the growth-adjusted rate of return would be:

$$i^* = \frac{0.12-0.10}{1.10} = 0.018$$

The present value factor for an annuity for 5 years at a rate 1.8 per cent is 4.740. thus, the present value of your salaries would be:

$$P = \frac{Rs.2,000}{1.10} \times 4.740 = Rs.8618$$

This amount is the same as we calculated earlier.

A dividend stream commencing one year hence at Rs. 66 is expected to grow at 10 per cent per annum for 15 years an then ceases. If the discount rate is 21 per cent, what is the present value of the expected series?

$$P = \frac{A}{1+g}\left[\frac{1-(1+i^*)-n}{i^*}\right] \text{ where } i^* = \frac{1-g}{1+g}$$

hence

$$i^* = \frac{0.21-0.10}{1.10} = \frac{0.11}{1.10} = 0.10$$

$$\text{and } \frac{A}{1+g} = \frac{Rs.66}{Rs.1.10} = Rs.60$$

Referring to Table D at the end of the book, we find the present value of an annuity of Re 1 and 10 per cent for 15 years is 7.606, therefore:

P = Rs. 60 X 7.606 = Rs. 456.36

In showing the calculation of the present value of constantly growing series of cash flows, we have assumed a finite time period. Cash flow may grow indefinitely. In mathematical term, we may say that n may extend to infinity ($n \longrightarrow \infty$) in equation (12). Then the calculation of the present value of a constantly growing perpetuity becomes very simple; it is given by the following equations:

$$P = \frac{A}{i-g}$$

Thus, in the example above if the dividend is expected to grow perpetually, the present value would be:

$$P = \frac{66}{0.21-0.10} = \frac{Rs.66}{0.11} = Rs.600$$

Value of an Annuity Due

The concepts of compound value and present value of an annuity discussed earlier are based on the assumption that series of payments are made at the end of the year. In practice, payments could be made at the beginning of the year. When you buy a scooter on installment sale, the dealer requires you to make the first payment immediately (Viz. in the beginning of the first period) and subsequent installments in the beginning of each period. Similarly it is common in lease or hire purchase contracts to require payments to be made in the beginning of each period. Lease is a contract involves regular payments (installments) for acquiring) for owing an asset. A series of fixed payments starting at the beginning of each period for a specified number of periods is called an annuity due.

Present Value of an Annuity due

Now a question arises: What is the present value of the annuity if each payment is made at the beginning of the year? Let us consider a 4-year annuity of Re 1 each year paid in the beginning of the year, the interest rate being 10 per cent. Note that the first payment is made immediately, therefore its present value is equal to its absolute value. Other payments have been discounted at 10 per cent to compute their present values. Thus, the present of the series of payments is:

$$PV = \frac{\text{Re}1}{(1.10)^0} + \frac{\text{Re}1}{(1.10)^1} + \frac{\text{Re}1}{(1.10)^2} + \frac{\text{Re}1}{(1.10)^3}$$

$$= \text{Re}1 + \text{Re}0.909 + \text{Re}0.826 + \text{Re}0.751 = Rs.3.487$$

The formula for the present value of an annuity due is :

$$P = A\left[1\frac{1}{(1+r)} + \frac{1}{(1+r)^2} + \ldots\ldots\ldots + \frac{1}{(1+r)^{n-1}}\right] = A\left[1\frac{1-(1+r)^{-n}}{r}\right](1+r) \quad (15)$$

$$P = A(PVAF_{n,r})\,(1+r) \quad (16)$$

Applying Equation (18), the present value of Re 1 paid at the beginning of each year for 4 years is:

Re 1(3.170) (1.10) = Rs. 3.487

The present value annuity factors in table D should be multiplied by (1+ r) to obtain relevant factors for an annuity due.

Effective versus Stated Rate

If the stated rate of interest is 12 per cent, a sum of Rs. 1000, will grow to Rs. 1,123.6 at the end of a year if compounding is done semi-annually. This means that Rs.1000 grows at the rate of 12.36 per cent per annum. The figure of 12.36 per cent is called the effective interest under annual compounding which produces the same result as that produced by an interest rate of 12 per cent under semi- annual compounding.

$$\text{Effective interest rate} = \left[1 + \frac{Stated\ annual\ \text{int}erest\ rate}{m}\right]^m - 1$$

Where m is the frequency of compounding per year.

Suppose a bank offer 12 per cent stated annual interest rate. What will be the effective interest rate when compounding is done annually, semiannually, and quarterly?

$$\text{Effective interest rate with annual compounding} = \left[1 + \frac{0.12}{1}\right]^1 - 1 = 0.12$$

$$\text{Effective interest rate with semi-annual compounding} = \left[1 + \frac{0.12}{2}\right]^2 - 1 = 0.1236$$

$$\text{Effective interest rate with quarterly compounding} = \left[1 + \frac{0.12}{4}\right]^4 - 1 = 0.1255$$

When compounding becomes continuous, the effective interest rate is expressed as follows:

Effective interest rate = e – 1

Where e = base of natural logarithm

R = stated interest rate

11.6 Summary

Money has time value. A rupee today is more valuable than a rupee a year hence. The time values of money are future value and present value. Future value depends on compounding of interest to measure the value of future amounts. When interest is compounded, the initial principal of the following period and so on. Interest can be compounded annually, six monthly, quarterly, monthly, weekly, daily or even continuously. The more frequently interest is compounded, the larger is the future amount that will be accumulated.

Present value represents the opposite (inverse) of compound value. In finding the present value of a future sum, we determine what amount of money today would be equivalent to the given future amount, considering the fact that we can earn certain return on this money. The sum is discounted using a discount rate the future values and present values can be used to determine (i) the deposit needed to accumulate a future sum, (ii) loan amortization payments (iii) Interest and growth rates and so on. The present value of perpetuity can also be calculated.

11.7 Key Words

- **Compound Interest:** If for one period is added to the principal to get the principal for the next period, it is called compounded interest.
- **Present Value:** It is a method of assessing the worth of an investment by inverting the compounding process to give present value of future cash flows.
- **Annuity:** An annuity is a cash flow, either income or outgoings, involving the same sum in each period.
- **Perpetuity:** Perpetuity is a financial instrument that promises to pay the equal cash flow per period.

11.8 Self Assessment Test

1. 'Cash flows of two years in absolute terms are incomparable'. Give reasons in support of your answer
2. 'Generally individuals show a time preference for money'. Give reason for such a preference.
3. Is the adjustment of time relatively more important for financial decisions with short-range implications or for decisions with long-range implications? Explain.

UNIT - 12 : CAPITAL BUDGETING METHODS

Unit Structure

12.0 Objectives

After studying this unit, you should be able to understand:

- The manning, objective and significance of capital Budgeting
- Capital Budgeting methods
- Capital Rationing

12.1 Introduction

Capital budgeting is not the budgeting for raising capital from different sources of finance, but it is an investment decision. Therefore, capital budgeting is a process relating to the long-term investment of capital funds in which future profitability of capital investment proposal is studied, comparison of earnings with costs in relation to cost of capital is made and finally a decision is taken whether to investment or not. Thus, **capital budgeting refers to the total process of generating, evaluating, selecting and following up of capital expenditure alternatives.** Capital budgeting decision can be defined as the firm's decision to invest its current funds most efficiently in long-term activities in anticipation of an expected flow of future benefits over a series of years.

12.2 Objectives and Significance

The following are objectives and significance of capital budegeting

(1) Wealth Maximization of Shareholders : The objective of capital budgeting is to select those long-term investment projects which are expected to make maximum contribution to the wealth of shareholders in the long run.

(2) Evaluation of Proposed Capital Expenditures : With the help of capital budgeting, evaluation of capital expenditures to be incurred on various assets by the firm during the budget period can be made.

(3) Determination of Priority : In capital budgeting the priority among various capital projects is determined so that management is able to select most-profitable project.

(4) Cost Control : Control over expenditures is exercised through capital budgeting since there is a regular comparison of the budgeted and the actual expenditures. Corrective actions can be taken whenever there are variances.

(5) Analysis of Past Decisions : Expenditures incurred on various projects in the past are analyzed in capital budgeting. This enables the management to know the extent to which these decisions were correct and future politics.

(6) Capital Structure Planning : The surplus generated by a project depends upon cost of capital which in turn depends upon the capital structure of the firm. Therefore, capital structure planning is also automatically done.

12.3 Capital Budgeting Methods

Before accepting or not accepting the capital expenditure proposals, the profitability of these proposals should be taken into consideration. The capital funds are invested to obtain sufficient future economic return to warrant the original outlay i.e., sufficient receipts over the life of the project for the justification of investment made. To judge the profitability of any investment proposals, finance manager must consider (i) the amount expended i.e. the net amount of investment, (ii) the operating cash inflows, and (iii) the time period over which these benefits will accrue i.e., the economic life of the project. An investment proposal should be displayed with regard to these three elements.

There are a number of methods used for evaluation of capital expenditure proposals. These methods can be grouped into two categories as Follows:

12.3.1 Traditional Methods

Traditional Methods of capital budgeting are widely used for a long time. These methods of capital budgeting are Payback Period Method and Accounting Rate of Return Method.

(a) Payback Period Method

Payback Period Method is the easiest method for evaluation of capital expenditure. This method is also known as pay-out and pay-off methods. The payback period is known as the number of years required for the proposal's cumulative cash inflows to be equal to its cash outflows. In other words, the payback period refers to the length of time required to recover the initial cost of the project.

Decision Criteria

The payback period calculated for a project/proposal is compared with predetermined target period. The proposal is rejected if the payback period is more then the target period and vice versa. If the different proposals are to be compared in order of priority, then the proposal with the shortest payback period should be selected.

Computation of Payback Period

There can be two different situations for calculating payback period:

(a) When annual cash inflows are equal: when cash inflows generated by an investment proposal are equal per time period, the payback period can be calculated by dividing the cash outflow by the uniform annual cash inflow. The following formula can be used:

$$P = \frac{C}{R}$$

Where,

P = Payback Period

C = Initial Investment

R = Uniform annual net return after taxes but before depreciation i.e. the net annual cash inflow.

Illustration 1 If a company by investing Rs. 4, 00, 000 gets net annual income of Rs. 1, 00, 000 before depreciation but after taxes continuously for 10 years, Compute the Payback Period.

Solution:

$$P = \frac{C = 400000}{R = 100000} = 4 Years$$

Illustration 2 Mohan Ltd. wants to buy a new machine on the condition that its costs can be recovered in five years by the savings therefrom. You are given the following information:

1) Cost of the machine — Rs. 6, 00, 000
2) Annual Sales revenue generated by the new machine — Rs. 8, 00, 000
3) Variable Cost — 60% of sales
4) Annual Fixed cost other than depreciation — Rs. 40, 000
5) Life of the machine is 8 years
6) Taxation to be charged @ 50% of profits

Advise the management whether the machine could be acquired or not.

Solution:

Particulars	Rs.	Rs.
Sales Revenue		8,00,000
Less: variable Cost(60% of sales)	4,80,000	
Fixed Cost	40,000	5,20,000
Profit before Tax and depreciation		2,80,000
Less: Depreciation		75,000
Profit before tax		2,05,000
Less: Income tax @ 50%		1,02,500
Profit after tax		1,02,500
Add: Depreciation		75,000
Net Cash inflows		1,77,500

Payback Period: C = Rs, 6,00,000 = 3.38

R Rs 1,77,500

Advise: the machine should be acquired.

b) Computation of Payback period when cash flows are unequal: In such a situation, payback period

is calculated by the process of cumulating cash flows till the time when cumulative cash flows become equal to original investment.

Illustration 3 V.K Ltd evaluates an investment proposal which costs Rs. 40, 000 and yields CFAT of Rs. 8, 000, Rs. 12, 000, Rs. 15, 000, Rs. 20, 000, Rs. 21, 000 and Rs. 24, 000 in the years 1 to 6 respectively.

Solution:

Year	Annual CFAT (Rs.)	Cumulative CFAT (Rs.)
(i)	(ii)	(iii)
1	8,000	8,000
2	12,000	20,000
3	15,000	35,000
4	20,000	55,000
5	21,000	76,000
6	24,000	1,00,000

Payback Period of investment proposal = 3 + $\frac{\text{Rs. 40, 000 – 35, 000}}{\text{Rs. 20,000}}$

= 3 + $\frac{\text{Rs. 5000}}{\text{Rs 20,000}}$ = 3.25 years

Risk factor: Risk is also considered in payback method. The project with a shorter payback period will be less risky in comparison to the project with longer payback period.

Limitations of Payback Period

1. More emphasis on liquidity which is not correct.
2. It ignores time value of money.
3. It ignores size of the project.
4. No emphasis on income of last year
5. No proper weightage to risk.
6. Considers original investment whereas whole life earnings must be considered.
7. Rejects cost of capital which is an important decision.

Accounting rate of Return method

This method is also known as Average Rate of Return Method. The ARR is based on the accounting concept of return on investment. The ARR may be defined as the annualized net income earned on the average funds invested in the project. In other words, the annual returns of a project are expressed as a percentage of the net investment in the project.

It can be calculated in the following ways:

(a) Accounting rate of return on Initial Investment: It is simply the ratio between initial investment and estimated net average annual income. It is calculated in the following manner :

$$\text{ARR} = \frac{\text{Average Annual Profit After Tax}}{\text{Initial Investment}} \times 100$$

(b) Accounting Rate of Return on Average Investment: In this method also average net income is calculated. Average net income is divided not by initial investment but by average investment. It is calculated in the following manner:

$$ARR = \frac{\text{Average Annual Income After Tax \& Depreciation}}{\text{Average Investment}} \times 100$$

The calculation of ARR is also considered in relation to equal and unequal annual profits which is classified as follows:

* **Equal Profits :** If the expected profits generated are equal then annual profit is average profit itself. So,

$$ARR = \frac{\text{Average Profit (after tax)}}{\text{Average Investment}} \times 100$$

* **Unequal Profits :** If the project generates unequal profits in different years, ARR is calculated as follows :

$$ARR = \frac{\text{Average Annual Profit (after tax)}}{\text{Average Investment}} \times 100$$

Since the profits should be after tax but when cash inflows are given, the ARR may be calculated as follows :

$$ARR = \frac{\text{Average Annual Cash Inflows - Annual Depreciation}}{\text{Average Investment}} \times 100$$

Calculation of Depreciation :

$$\text{Annual Depreciation} = \frac{\text{Initial Investment - Scrap Value}}{\text{Life of the Project}}$$

Calculation of Average Investment :

$$\text{Average Investment} = \frac{\text{Initial Investment + Scrap Value}}{2}$$

$$ARR = \frac{\text{Average Annual Cash Inflows} - \left(\frac{\text{Initial Investment - Scrap Value}}{\text{Life of the Project}}\right)}{\frac{1}{2}\left(\text{Initial Investment + Scrap Value}\right)}$$

Decision Criterion : If average rate of return is more than the prespecified rate of return then the project is likely to be accepted, otherwise not. In this method, when different projects are evaluated, return on investment from all alternative projects is calculated and the project which gives the highest return is selected.

Illustration 4 Lucas Pipes Ltd. is contemplating an investment of Rs. 1,00,000 in a new plant, which will provide a salvage value of Rs. 8,000 at the end of its economic life of 5 years. The profits after depreciation and tax are estimated to be as under :

Year	Profits (Rs)
1	5,000
2	7,500
3	12,500
4	13,000
5	8,000

Calculate the accounting rate of return.

Solution :

$$\text{ARR} = \frac{\text{Average Annual Profits after Depreciation and Tax}}{\textit{Average Investment}} \times 100$$

$$= \frac{Rs\,9{,}200}{Rs.54{,}000} \times 100 = 17.04\%$$

Average Annual Profits

$$= \frac{Rs.5{,}000 + Rs.7{,}500 + Rs.12{,}500 + Rs.13{,}000 + Rs.8{,}000}{5} = Rs.9{,}200$$

$$\text{Average Investment} = \frac{Original Investment + Scrap\ Value}{2}$$

$$= \frac{Rs.1{,}00{,}000 + Rs.8{,}000}{2} = Rs.54{,}000$$

Illustration 5 ABCD Ltd. is considering investment in a project that will cost Rs. 5,00,000. The extimated salvage value is zero; tax rate is 40%. The company uses straight line depreciation method and the proposed project has cash flows before tax (CFBT) as follows:

Year	CFBT
	Rs.
1	1,00,000
2	1,00,000
3	1,50,000
4	1,50,000
5	2,50,000

Determine (i) Pay-back period, and (ii) Average rate of return.

Solution :

(i) Calculation of Pay-back Period:

For calculation of pay-back period, first of all, every year's after-tax net cash inflow is to be found out; but here the cash flow is before-tax. Its calculation is given as under :

Cash Inflows

Year	CFBT	Depreciation (Rs.)	Net earnings (Rs.)	Tax @40% (Rs.)	Net earnings after tax	CFAT (Rs.)	Cumulative CFAT (Rs.)
1	2	3	4	5	6	7	8
1	1,00,000	1,00,000	-	-	-	1,00,000	1,00,000
2	1,00,000	1,00,000	-	-	-	1,00,000	2,00,000
3	1,50,000	1,00,000	50,000	20,000	30,000	1,30,000	3,30,000
4	1,50,000	1,00,000	50,000	20,000	30,000	1,30,000	4,60,000
5	2,50,000	1,00,000	1,50,000	60,000	90,000	1,90,000	6,50,000
					1,50,000		

The pay-back period is 4 years plus fraction of fifth year. The fraction value is equal to 0.21, i.e., Rs. 40,000/1,90,000. The pay-back period is 4.21 years.

(ii) Average Rate of Return (ARR) :

(a) Based on average investment

$$ARR = \frac{Average\ Annual\ Net\ Income}{Average\ Investment} \times 100$$

$$= \frac{\frac{Rs.1,50,000}{5}}{\frac{Rs.50,000}{2}} \times 100 = \frac{Rs.30,000}{Rs.2,50,000} = 12\%$$

$$\text{ARR} = \frac{\text{Average Annual Net Income}}{\text{Initial Investment}} \times 100$$

$$= \frac{\text{Rs. } 30,000}{\text{Rs. } 5,00,000} \times 100 = 6\%$$

Merits of Average Rate of Return Method : Following are the merits of ARR method :

- **Considers profitability :** ARR method considers the profitability of an investment. It considers all the benefits airsing out of the proposal.
- **Easy to implement :** ARR method is easy to implement, adopt and understand. The relevant data required for calculation is easily available.
- **Helps in decision-making :** Right decision regarding investment proposals is taken by comparing ARR with cost of capital.
- **Appropriate use of wealth :** Businessman can use this method for the investment of his wealth.
- **Theoretically sound method :** As in this method, net income after depreciation is used, it is considered the most sound method of capital budgeting.

Demerits of Average Rate of Return Method : Unlike the payback period method, the ARR considers all the benefits arising out of the proposal through out its economic life. However, the ARR has certain drawbacks as follows :

- **Ignores time value of money :** This method does not consider the time value of money and considers the profits earned in the first year as equal to the profits earned in later years. It does not discount the future profits.
- **Based on accounting profits :** The ARR is based on the accounting profits rather than the cash flows, and accounting profits are effected by accounting policies. It should be noted that a sound evaluation technique should be based on the cash flows rather than the accounting profits.
- **Ignores life of the proposal :** The ARR ignores life of the proposal. A proposal with the longer life may have the same ARR as another proposal with shorter life. According to ARR, both the proposals are put at par while the proposal with longer life should be preferred over the proposal with shorter life because the proposal with longer life will generate the return for a longer time. But, the ARR fails todistinguish between the two.
- **No consideration for salvage value :** The ARR ignores salvage value of the proposal while in real sense, the salvage value is also a return from the proposal and should be considered.
- **Size of investment :** The ARR fails to recognise the size of investment required for the project, particularly in case of mutuallly exclusive proposals. The two projects having significantly differential costs may have same IRR.
- **Rate of return :** It is quite difficult to find out in this method whether the rate of return earned on investment is fair or not. Generally, the minimum rate of return on the investment is decided by higher management and the projects having less than this rate are not considered.

On the basis of the above merits and demerits it can be concluded that ARR is simple but not a logical method of evaluation of capital bugeting proposals. Since, it is based on accounting profits and not on cash flows, it does not help in understanding the contribution of the proposal for maximising the wealth of the firm. As a matter of fact, the ARR lack much to be a sound method for evaluation. This method shares all of the drawback of the payback period method.

To conclude the discussion on traditional methods of evaluation, it can be said that both payback period and ARR methods fail to be sound and efficient methods. Both the methods suffers from (i) ignoring the time value of money, and (ii) non-consideration of total benefits arising from a proposal. But these aspects are taken into consideration by the discounted cash flow method of evaluation of capital budgeting proposals.

12.3.2 Discounted Cash Flow or Time Adjusted Rate of Return Method

The techniques based on discounted cash flows not only replace accounting profit with cash flows but also explicitly consider the time value of money. The time adjusted rate of return is based on the theory that one rupee obtained after one year or any other period is less valuable than the one rupee received today. This decrease ordinarily depends on the interest rate leaving beside other non-monetary factors. So, in any investment or projects the time adjustment should be made for future earnings. The present value of future earnings is compared with the cost of investment. The present value of future earnings can be known like compound interest. In compound interst method, any amount is taken in present and it is compounded with a certain rate of interest for a specified period.

Rate of Interest : The rate of interest also known as discounting rate refers to the minimum rate of return which a firm wants to earn on the amount invested. This minimum rate of return is also known as cost of capital.

Calculation of Present Value : The present value of any amount receivable in future after a definite period can be calculated by the following mathematical formula or with the help of present value tables :

$$PV = \frac{C}{(1+r)} + \frac{C_2}{(1+r)^2} + \frac{C_3}{(1+r)^3} + \ldots\ldots\ldots \frac{C_n}{(1+r)^n}$$

where,

PV = Present value of future cash inflows

C = Cash inflows

n = Number of years

r = Rate of interest

Based on the above discounting procedure, there are two basic discounted cash flow techniques to evaluate capital budgeting proposals. These are the Net Present Value Method and Internal Rate of Return Method. However, there is one variant of Net Present Value Method known as Profitability Index Method. These methods are explained as follows:

Net Present Value Method :

The NPV method is the foremost of the discounted cash flow techniques. **The NPV of an investment proposal may be defined as "the sum of the present values of all the cash inflows *less* the sum of present values of all the cash outflows associated with a proposal".** Thus, the NPV is the sum of the discounted values of the net cash flows of a proposal. In case, the cash outflows occur only in the beginning at time 0, then the NPV is defined as the sum of present values of cash inflows *less* the initial investment.

Computation of Net Present Value :

It is also known as excess present value or net gain. It is the difference between the sum of present value of its cash inflows and present value of cash outflows i.e., initial investment. This can be expressed as follows:

Net Present Value (NPV)

= Total Present value of cash inflows - Initial investment.

Decision Criterion :

The decision criteria under the NPV method is "Accept the proposal if its NPV is positive and reject the proposal if its NPV is negative".

Features of NPV method :

The NPV technique has a number of important features, which are as follows:

- **The NPV's are additive :** The NPV of different projects can be added up to arrive at a cumulative NPV for a business.
- **Intermediate cash flows are reinvested at discount rate :** NPV calculations are based on the assumption that all the intermediate cash inflows are reinvested at the specified discount rate.
- **NPV calculations allow for the expected change in the discount rate : NPV** can be computed by using time varying discount rates.

Merits of NPV technique

- **Recognise time value of money :** The foremost merit of NPV is that it recognises time value of money.
- **Considers entire cash flow :** The NPV technique considers entire cash flow i.e., all the cash inflows and outflows, irrespective of timing of their occurrence.
- **Systematic method :** The NPV technique is based on cash flows and helps in analysing effect of proposal on the wealth of shareholders in a better way.
- **Considers discount rate :** The discount rate k is the minimum required rate of return which incorporates both pure as well as premium, applied in determining future cash flow.
- **Contributes towards wealth of the firm :** The NPV technique plays a very important role towards the wealth of the firm and is in full conformity with the objective of maximisation of wealth of shareholders.

Demerits of NPV Technique

The NPV technique has the followings shortcomings or demerits :

- **Difficult to calculate :** The NPV techniques involves difficult calculation.
- **Requires pre-determination of required rate of return**

Decision under NPV technique is based on the value which is an absolute measure. It ignores difference in intial outflows, size of different proposals etc. while evaluating different proposals.

Illustration 6 :

A project involves a net cash inflow of Rs. 3 lacs a year for three years and the cost of capital is 8%. Find the present value of cash inflows.

Solution :

$$PV = \frac{C_1}{(1+r)} + \frac{C_2}{(1+r)^2} + \frac{C_3}{(1+r)^3}$$

$$= \frac{Rs.\ 3{,}00{,}000}{(1+.08)} + \frac{Rs.\ 3{,}00{,}000}{(1+.08)^2} + \frac{Rs.\ 3{,}00{,}000}{(1+.08)^3}$$

$$= Rs.\ 2{,}77{,}800 + Rs.\ 2{,}57{,}100 + Rs.\ 2{,}38{,}200$$

$$= Rs.\ 7{,}73{,}100$$

Calculation of Present Values with the help of Present Value Table

Year	Cash inflows (Rs.)	P.V. factor at 8%	Present value (Rs.)
1	3,00,000	0.926	2,77,800
2	3,00,000	0.857	2,57,100
3	3,00,000	0.794	2,38,200
	Total Present Value		7,73,100

With the help of cumulative PV Table (Annuity of Re. 1)

In the cumulative present value table (Annuity of Re. 1) the present value of Re. 1 of 3 years at 8% interest rate is 2.577.

$\therefore$ Present value of cash inflows of Rs. 3,00,000 for 3 years at 8% discount rate

$= Rs.\ 3{,}00{,}000 \times 2.577 = Rs.\ 7{,}73{,}100$

Illustration 7 :

The management of Rakesh Ltd. wants to invest Rs. 10,000 in a project which will give earnings for five years. The earnings after tax but before depreciation will be Rs. 2,000 in the first year, Rs. 4,000 in the second year, Rs. 4,000 in the third year, Rs. 2,000 in the fourth year and Rs. 1,000 in the fifth year.

Please suggest management whether this project is worthwhile to be taken, if management has suggested 10% discount rate for the computation of present value.

The present value of Rs. 1 for five years at 10% discount rate is 0.909, 0.826, 0.751, 0.683 and 0.621 respectively.

Solution :

Year	Cash Inflow (Rs.)	Present Value of Re. 1 at 10% Discounting	Total Present value at 10% Discounting (Rs.)
1	2,000	0.909	1,818
2	4,000	0.826	3,304
3	4,000	0.751	3,004
4	2,000	0.683	1.366
5	1,000	0.621	621
		Total	10,113

NPV = Present Value of Cash Inflows - Initial Investment

= Rs. 10,113 - Rs. 10,000 = Rs. 113

Project should be accepted becuase it has a positive net present value.

Profitability Index or Benefit Cost Ratio

Profitability Index is the relationship between present value of cash inflows and present value of cash outflows. It can be calculated by using the following formula.

$$\text{Profitability Index} = \frac{\text{Present value of Cash Inflows}}{\text{Present value of Cash Outflows}}$$

Project can be ranked on the basis of profitability Index. The project is said to be viable if ratio is equal or greater than 1.

Decision Criterion :

Under the PI technique, the decision rule is "Accept the proposal if PI is more than 1 and reject the proposal if PI is less than 1". However, if PI is equal to 1 then the firm may be indifferent because the

present value of cash inflows is expected to be just equal to the present value of the cash outflows. While ranking of mutually exclusive proposals, the proposal with the highest positive PI is given top priority and the proposal with the lowest PI will be given lowest priority.

Merits and Demerits :

The profitability index technique is an extension of NPV technique. Therefore, PI technique of capital budgeting inherits the same merits and demerits which the NPV has.

Internal Rate of Return (IRR) Method :

It is an important technique of evaluation of capital budgeting proposals. The IRR is defined as **"the discount rate which gives a zero NPV"** *i.e.,* **the IRR is the discount rate which will equate the present value of cash inflows with the present value of cash outflows.**

In the present value method and profitability index method, the expected rate of return is already known. So, the present value of future earnings can easily be calculated. But, when the expected rate of return is not known then, in such a condition, the future value of cash inflows should be made equal to the present value of initial investment. For this purpose, the rate used is also known as discounting cash flow rate, time adjusted rate, marginal rate of return, yeild rate etc. This discount rate is ascertained by trial and error procedure.

Decision Criterion :

To make a decision on the basis of IRR technique, the firm first has to determine its own required rate of return. This rate (K) is also known as the cut-off rate or the hurdle rate. A proposal may be accepted is IRR is more than the minimum rate (K) otherwise rejected. The firm may be indifferent if the IRR is just equal to the minimum required rate of return (K). For the evaluation of mutually exclusive proposals, the proposal with the highest IRR is given the top priority while the proposal with the lowest IRR is given the lowest priority.

Calculation of IRR : Calculation of IRR is done in the following two manners :

(a) When the annual cash inflows are equal : Projects which result in even cash inflows their internal rate of return can be calculated by determining present value factor in the following way:

$$\text{Present Value Factor} = \frac{\text{Initial Investment}}{\text{Annual Cash Inflow}}$$

Once PV factor is known, it is located in the Annuity Table on the line which represents number of years corresponding to economic life of the project.

$$\text{IRR} = A + \frac{\text{PVA} - C}{\text{PVA} - \text{PVB}} \text{ - A}$$

where,

IRR = Internal rate of return

B = Higher trial rate

A = Lower trial rate

PVA = Present value of cash inflows with lower trial rate

PVB = Present value of cash inflows with higher trial rate

C = Initial or original investment

(b) When the annual cash inflows are not equal : In this case, the internal rate of return is computed by making trial calculations in order to compute exact IRR which equated the present value of cash inflows and cash outflows. In this process of calculation of IRR, the following steps are required:

* **Determination of first trial rate :** It is calculated on the basis of present value factor which is as follows:

$$\text{Present Value Factor} = \frac{\text{Initial Investment}}{\text{Average Annual Cash Inflow}}$$

$$\text{Average Annual Cash Inflow} = \frac{\text{Total Cash Inflows}}{\text{Economic Life of the Project}}$$

After this calculation, we use the annuity table and find out the IRR.

* **Applying second trial rate :** If the NPV gives positive vlaue, we apply the higher rate of discount and if still it gives positive net present value, we increase the discount rate until NPV becomes negative. If NPV becomes negative than IRR lies between these two rates.

Illustration 8 :

Determine the Internal Rate of Return using annuity method :

Initial Investment	Rs. 10,000
Cash Inflows :	
First year	Rs. 5,000
Second year	Rs. 5,000
Third year	Rs. 2,000

Solution :

Average Cash Inflow = 5,000 + 5,000 + 2,000/3 = Rs. 4,000

Divide the Initial Investment by the Average Cash Inflow :

$$= \frac{\text{Rs. } 10{,}000}{\text{Rs. } 4{,}000} = 2.5$$

This 2.5 PV value against column of three year is near to 10% rate, therefore, we shall take 10% and 12% rates for discounting :

10% Rate of Return

Year	Rs.	
1	5000 × 0.909	= Rs. 4,545
2	5000 × 0.826	= Rs. 4,130
3	2000 × 0.751	= Rs. 1,502
	Total	= Rs. 10,177

12% Rate of Return

Year	Rs.	
1	5000 × 0.893	= Rs. 4,465
2	5000 × 0.797	= Rs. 3,985
3	2000 × 0.712	= Rs. 1,424
	Total	= Rs. 9,874

$$IRR = A + \frac{PVA - C}{PVA - PVB} (B - A)$$

$$= 10 + \frac{10{,}177 - 10{,}000}{10{,}177 - 9{,}874} (12 - 10)$$

$$= 10 + \frac{177}{303} \times 2 = 10 + 1.17 = 11.1\%$$

Meritsof IRR Technique : Following are the merits of IRR technique :

- **Time value of Money :** The IRR technique takes into consideration the time value of money and the cash flows arising at different points of time are adjusted for time value of money to make them comparable.
- **Profit-oriented concept :** The IRR is a profit-oriented concept and helps in selecting those proposals which are expected to earn more than the minimum rate of return.
- **Percentage return :** The IRR of a proposal is expressed as a percentage and compared with the cut-off rate which is also expressed as a percentage.
- **Based on cash flows :** The IRR technique is based on cash flows rather than the accounting profit.
- **Consideration of other factors :** In this technique, the salvage value, the working capital used and released etc. are also considered.

Demerits of IRR Technique :

Though the IRR technique possesses all the ingredients of a sound evaluation technique, still it has some limitations as follows.

- **Complicated :** As far as the calculation of IRR is concerned, it involves tedious and complicated trial and error procedure.
- **Wrong assumption :** The IRR is based on the implied assumption that the future cash inflows of a proposal are reinvested at a rate equal to IRR.
- **Scaled measure :** Since the IRR is a scaled measure, it tends to be based towards smaller projects which are much more likely to give high percentage returns over the larger projects.
- **Dubious results :** There are a number of circumstances where the IRR technique may give dubious results. The first occurs when there is more than one IRR for a proposal and it is not clear that which one the decision-maker should use.

Comparison of NPV and IRR

NPV and IRR both are the methods of discounted cash flow (DCF) technique of evaluating capital investments. So far as the similarities of both the methods are concerned, both considers time value of money. Moreover, both the methods lead to the same acceptance or rejection decision rule where there is a single project. In spite of these similarities, both the methods differs in respect of the following.

1. **Minimum Required Rate of Return :** The main difference between the two methods is that whereas in NPV method, the minimum desired rate of return (cost of capital) is assumed to be known. On the other hand, in case of IRR methods this rate is to be determined through trial and error to arrive at the rate at which the present value is zero.
2. **Conclusions Differ :** In case of two mutually exclusive projects, it is not possible to reach at the same conclusions under the methods.
3. **Assumption of Re-investment :** The IRR methods implies that cash inflows generated by the project are re-invested at the internal rate of the project which may not be. On the other hand, in NPV method, the cash inflows are invested at the rate of firm's cost of capital which is more convincing.
4. **Basis of Computation of the Rate :** In IRR method, the re-investment rate is calculated in confirmity with the cash flows from the investment proposals which is never based on cost of capital. On the contrary, in NPV method, the re-investment rate is ascertained on the basis of cost of capital. Hence in first requires calculation of the cost of capital.

The NPV method is comparatively better because IRR method provides different rates for different proposals whereas re-investment rate for each proposal is the same in NPV method.

12.4 Modified Internal Rate of Return Method

As discussed earlier, there are several limitations attached with the concept of the Conventional Internal Rate of Return. The Modified Internal Rate of Return (MIRR) which is also known as ***Terminal Rate of Return (TRR)*** addresses some of these deficiencies such as it eliminates multiple IRR rates, it addresses the re-investment rate issue and produces results which are consistent with the Net Present Value method.

The MIRR is obtained by assuming a single outflow in the zero year and the terminal cash inflow as mentioned above. ***The discount rate which equates the present value of the terminal cash inflows to the zero year outflow is called MIRR.*** which is calculated by using the following formula :

$$I(1+r)^n = TV$$

or $$r = [TV / I]^{1/n} - 1 \quad \text{or} \quad \sqrt[n]{\frac{\text{Terminal Value}}{\text{Initial Investment}}} - 1$$

where, I = Initial Investment

r = Modified IRR

n = Project life

TV = Terminal Value

The decision rule followed in the case of MIRR is the same as in the IRR. If the MIRR is greater than the discount rate, the project should be selected. This has been explained in the illustration given below.

12.5 Modified Net Present Value Method

It is also called ***'Terminal Value (TV) Method'***. Under this method , it is assumed that each cash inflow is reinvested elsewhere immediately at a pre-determined rate of interest until the termination of the project. The re-investment rate for applying the terminal value technique is the marginal cost of capital. If the present value of the sum total of the compounded reinvested cash flows is greater than the present value of the cash outflows, the proposed projected is accepted, otherwise not. In case of mutually exclosively projects. The project with higher present value of the total of compouned cash flow is accepted. The formula used is as follow:

$$MNVP = \left(1 + k\right)^{TV} - I$$

where TV = Terminal Value

k = Cost of capital

I = Initial Investment

Discounted Pay-Back Period

In the pay-back period method discussed earlier, the discounting aspect or interest factor or time value of money has been ignored. This method recognises the time value of money by combining pay-back with discounted cash flow. Thus, when the pay-back period is calculated by taking into account discount or interest factor, it is known as discounted pay-back period. Thus, ***discounted pay-back can be defined as, the number of years required to recover the initial investment from the discount cash flows.*** The procedure for finding out the discountd pay-back period is the same as discussed earlier except present values of cash inflows at certain discount factor are used.

Illustration 9 :

Using the information given below, compute the Pay-back period under discounted Pay-back Method.

Initial Outlay					Rs. 80,000
Estimated Life					5 Years
End of the year	1st	2nd	3rd	4th	5th
Profit after tax (Rs.)	6,000	14,000	24,000	16,000	Nil

Depreciation has been calculated under straight line method. The cost of capital may be taken at 20% p.a. and P.V. of Re. 1 at 20% is given below :

Year	1	2	3	4	5
P.V. Factor	.83	.69	.58	.48	.40

Solution :

Calculation of Discounted Pay-back Period

Year	*Profit after Tax*	*Depreciation*	*Cash Inflows at 20%*	*P.V. factor*	*P.V. of cash inflow*	*Cummulative P.V. of Inflow*
	Rs.	Rs.		Rs.	Rs.	Rs.
1	6,000	16,000	22,000	.83	18,260	18,260
2	14,000	16,000	30,000	.69	20,700	38,960
3	24,000	16,000	40,000	.58	23,200	62,160
4	16,000	16,000	32,000	.48	15,360	77,520
5	Nil	16,000	16,000	.40	6,400	83,920

The cimmulative present value of cash inflows in the 4th year is Rs. 77,520 and in the 5th year it is Rs. 83,920. Hence, the pay-back period falls in between 4th and 5th year.

To be exact the pay-back period is 4.4 year $\left(4 \text{ years} + \frac{2,480}{6,400}\right)$.

12.6 Capital Rationing

Under the constraint of limited funds, the firm will be in a position to accept nly some profitable projects and reject others, though otherwise viable and profitable proejcts. Thus, when because of external or self imposed (internal) reasons a firm does not obtain necessary funds to invest in all profitable projects, such a situation in capital budgeting is referred to as Capital Rationing. In other words, ***the term capital rationing may be defined as a situation where the firm due to availability of limited resoureces sets absolute celling on its capital expenditure in a period at such a level that will cause it to reject or avoid some of the profitable projects.***

Types of Capital Rationing

As stated above, capital rationing is affected by the external and internal factors. Therefore, capital rationing is of two types i.e. external and internal capital rationing. ***External capital rationing*** is due to reasons outside the control of the company such as imperfection in capital market which can be attrubuted to non-availability of material information, investors attitude etc. ***Internal Capital rationing*** is due to self-imposed restrictions by management like not to raise additional debt or lying down a specified minimum rate of return on each project. Under both types of capital rationing, the projects can be classified into divisible projects and indivisible projects -

* **Divisible projects** are those projects which can be taken in full or can be taken in parts.
* **Indivisible projects** have a feature that either the project as a whole be taken in its totality or not taken at all. For example, a proposal to buy a helicopter or to install a multi-stage plant can not be taken in parts.

Selection Procedure in Capital Rationing

There are two steps involved in this selection procedure which are as under-

- The projects are to be ranked as per their profitability measured on the basis of discounted cash flow techniques *viz.* NPV, IRR or Profitability Index.
- Projects are to be selected in descending order up to the level the available funds are fully utilised.

This procedure has been explained with the illustration given below.

Illustration 10 : (Indivisible Projects) : Sanchit Limited has Rs. 10,00,000 allocated for capital budgeting purpose. The following proposals and associated profitability indexes have been determined.

Project	*Amount (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 the projects are indivisible there is no alternative use of the money allocated for capital budgeting.

Solution :

Statement Showing Ranking of Projects and their NPV

(In descending order of profitability index)

Projects	*Initial Investment*	*Profitability Index*	*Gross Present Value* (2) X (3)	*Net Present Value* (4) X (2)
(1)	(2)	(3)	(4)	(5)
	Rs.		Rs.	Rs.
1	3,00,000	1.22	3,66,000	66,000
3	3,50,000	1.20	4,20,000	70,000
5	2,00,000	1.20	2,40,000	40,000
4	4,50,000	1.18	5,31,000	81,000
6	4,00,000	1.05	4,20,000	20,000

Working Notes :

1. Project 2 has been rejected as its profitability index is less than 1 i.e. negative net present value.
2. Project 3 has been ranked higher than project 5 because its NPV is more though the profitability

index of both is some.

3. Sanchit Ltd. is advised to accept project 4, 3 and 5 because from their package the maximum NPV of Rs. 1,91,000 (Rs. 81,000 + Rs. 70,000 + Rs. 40,000) will be obtained.

12.6.1 Capital Budgeting And Inflation

Adjustment for inflation would depend upon whether the estimates of cashflows have been made at constant prices or at current prices. In case the estimates of cashflows have been made on the basis of constant prices, no separate adjustment for inflation is required (constant price imply that inflation has been taken care of in the estimation of cashflows). On the other hand, if cashflows estimates are in terms of current prices, these would require an adjustment for price level changes.

Thus, there are ***two approaches for adjustment for inflation.*** These are briefly discussed below:

(1) Adjust the Discount Factor : The Discount factor, i.e., the cost of capital is adjusted, by adding a certain factor to the discount rate. For example to the discount factor or 12% say a fraction 1.5% is added on account of inflation and the adjusted discount factor becomes 13.5% (12 + 1.5%).

(2) Adjustment of Cashflows : The second approach for inflation adjustment is to adjust yearly cash flows on account of inflation. Adjusted cashflows are used for evaluation purposes. The procedure to adjust annual cashflows is as under-

- Forecast inflation rates for the coming years;
- Adjust annual cashflows on account of inflation;
- Evaluate the adjusted cashflows to decide about the proposal

12.7 Summary

Capital budgeting (or investment appraisal) is the planning process used to determine whether a firm's long term investments such as new machinery, replacement machinery, new plants, new products, and research development projects are worth pursuing. It is budget for major capital, or investment, expenditures.

Many formal methods are used in capital budgeting, including the techniques such as

- Accounting rate of return
- Net present value
- Profitability index
- Internal rate of return
- Modified internal rate of return
- Pay Back Period

These methods use the incremental cash flows from each potential investment, or project Techniques based on accounting earnings and accounting rules are sometimes used - though economists consider this to be improper - such as the accounting rate of return, and "return on investment." Simplified and hybrid methods are used as well, such as payback period and discounted payback period.

Accounting rate of return, also known as the Average rate of return, or ARR is a financial ratio used in capital budgeting. The ratio does not take into account the concept of time value of money. ARR calculates the return, generated from net income of the proposed capital investment. Each potential project's value should be estimated using a discounted cash flow (DCF) valuation, to find its net present value (NPV). This valuation requires estimating the size and timing of all the incremental cash flows from the project. These future cash flows are then discounted to determine their present value. The NPV is greatly affected by the discount rate, so selecting the proper rate - sometimes called the hurdle rate - is critical to making the right decision. The hurdle rate is the minimum acceptable return on an investment. It should reflect the riskiness of the investment, typically measured by the volatility of cash flows, and must take into account the financing mix.

Profitability index (PI), also known as profit investment ratio (PIR) and value investment ratio (VIR), is the ratio of investment to payoff of a proposed project. It is a useful tool for ranking projects because it allows you to quantify the amount of value created per unit of investment. The internal rate of return (IRR) is defined as the discount rate that gives a net present value (NPV) of zero. It is a commonly used measure of investment efficiency.

The IRR method will result in the same decision as the NPV method for (non-mutually exclusive) projects in an unconstrained environment, in the usual cases where a negative cash flow occurs at the start of the project, followed by all positive cash flows. Modified internal rate of return (MIRR) is a financial measure of an investment's attractiveness. It is used in capital budgeting to rank alternative investments. Payback period in capital budgeting refers to the period of time required for the return on an investment to "repay" the sum of the original investment. Other methods such Capital rationing also form an important method in evaluating Capital Budgeting proposals. Companies may want to implement capital rationing in situations where past returns of investment were lower than expected.

12.8 Key Words

- **Capital Budgeting:** Total process of generating, evaluating, selecting and following up of capital expenditure alternatives.
- **Net Present value (NPV):** Aggregate of present value of expected inflows minus the total present values of expected outflows; where the inflows and outflows are discounted for timing a rate of discount equal to the cost of capital of the firm.
- **Average Rate of Return (ARR):** It is average rate found out by dividing the average annual income after tax by the average investment.
- **Internal Rate of Return (IRR)**: Rate which actually equates the present value of expected cash inflows with the present value of expected cash outflows.

  Profitability Index: Ratio of net present value and initial cash outlay. also known as "Benefit Cost ratio"
- **Capital Rationing:** It is a situation where the firm due to availability of limited resources sets absolute ceiling on the capital expenditure in a period at such a level that will cause it to reject some of the profitable projects.

12.9 Self Assessment Test

1. Critically examine the various methods of evaluation of capital budgeting proposals. Discuss their advantages and disadvantages.

2. Discuss the relative merits of (a) Pay Back; (b) Net Present Value; (c) Average Rate of Return techniques for the appraisal of investments.

3. A Limited company is considering investing in a project requiring a capital outlay of Rs. 1, 00, 000. Forecasts of annual income after depreciation but before tax is as follows:

Year	1	2	3	4	5
Amount (Rs.)	50,000	50,000	40,000	40,000	20,000

Depreciation may be taken at 20% on original cost and income tax at 50% of net income. Evaluate the project using Pay back method.

[Answer: Pay Back Period: 2 years 3 months]

4. Calculate the average return of return for projects A and B from the following:

	Project A (Rs)	Project B (Rs)
Investments	40,000	60,000
Expected Life	4 years	5 Years
Salvage Value	4,000	8,000

Projected Net income (after interest, depreciation & taxes)

Year	1	2	3	4	5
Project A (Rs)	4,000	3,000	3,000	2,000	-
Project B (Rs)	6,000	6,000	4,000	2,000	2,000

If the required rate of return is 12%, which project should be undertaken?

[Answer: Project A - 13.64%, Project B - 11.76%, Project A should be selected]

5. Answer the following:

(a) A project costs Rs. 25, 000, Scrap Value Rs 5, 000, Life of 5 years and annual average income before depreciation and tax Rs 7, 200. Assuming tax rate @ 50% and depreciation on Straight Line basis, find out ARR.

(b) For an initial outlay of Rs. 10, 000 a machine generates cash inflows of Rs. 5, 000 for 3 years. If the required arte of return is 10%, find out the NPV of the project.

UNIT - 13 : RISK ANALYSIS IN CAPITAL BUDGETING

Unit Structure

13.0 Objectives

After studying this unit, you should be able to understand:

- Concept of risk and uncertainty.
- Different types of risk.
- Various risk evaluation approaches and decision making.

13.1 Introduction

The techniques that are used in 'capital budgeting' require of estimation of future cash inflows and outflows by taking into account factors like economic life of project, salvage value of the asset at the end of economic life, capacity of the project in terms of technology, selling price of its output, production cost, future demand for the output, rate of depreciation and taxation, cost of capital etc. However, due to uncertainties about future, the estimates of demand, production, sales, costs, variables not be exact. All these elements of uncertainty have to be taken into account in the form of forcible risk while taking decision on investment proposals. This risk varies from forcible risks while taking a decision on investment proposals. This risk varies from the investment proposals to another, some proposals may be risk less, some may be less risky, while the other may be more risky. Similarly, future events cannot be anticipated with certainty due to economic, social, fiscal, political and other reasons. Since such risk and uncertainty would greatly affect the acceptance or rejection of the investment proposals, it becomes imperative to incorporate the risk factor in investment analysis.

13.2 Concept of Risk and Uncertainty

Risk may be defined as the variability which may likely to accrue in future between the estimated/ expected returns and the actual returns. The higher the variability that is likely to occur in prospective cash flows sequence, the greater is the risk involved in the project and vice-versa.

In context of capital budgeting or investment decisions, the term 'risk' and 'uncertainty' are used interchangeably and imply variability of expected returns or cash inflows associated with an investment proposal. However, they have different meanings in different contexts. *Risk is that risk which is predictable, and to which probabilities can be assigned.* Thus, in a risk situation, the decision maker knows the probabilities of occurance of particular event or expected outcomes. He can estimate the probabilities of outcomes on the basis of past experience or historical data. Such estimates are made objectively.

'Uncertainty' is that event which cannot be predicted and therefore, there is no question of assigning probability to it. Thus, uncertainty exists when the decision maker does not know the probabilities of occurance of particular event or expected outcomes. He can only estimate the probabilities of outcomes on the basis of a guess as he has no historical data for making estimation as in the case of a new project. Such guesses are made subjectively.

13.3 Types of Risk

There may be several types of risks associated with a capital budgeting decisions. Important among those are as follows:

- **Business Risk** is the variability in earnings due to normal business operations.
- **Financial Risk** is the variability in earnings due to change in capital structure.
- **Investment Risk** is the variability in earnings due to variations in cash inflows and outflows on account of forecasting errors, technological changes, etc.
- **Portfolio Risk** is the variability in earnings due to degree of efficient diversification achieved by the firm in its operations and its overall portfolio of assets.

13.4 Risk Evaluation Approaches

Though, evaluation of risk is a difficult task, however the following techniques can be applied to handle the risk:

1. General Techniques

(i) Risk Adjusted Discount Rate
(ii) Certainty Equivalent

2. Quantitative Techniques

(i) Statistical Techniques
(a) Probability Approach
(b) Measures of Dispersion
- Standard Deviation
- Co-efficient of Variation

(ii) Decision Tree Analysis

These are discussed below:

13.4.1 RISK ADJUSTED DISCOUNT RATE (RADR)

It is also known as 'Varying Discount Rate Method.' **Risk Adjusted Discount Rate is a discount rate applicable to a risky investment and is the sum of risk free rate and a risk premium relating to that investment.** In brief:

Risk Adjusted Discount Rate = Risk Free Rate + Risk Premium Rate

Risk Free Rate of Return is the rate of return at which cash flows should be discounted had there be in no risk. It is equivalent to rate of interest in market on Government Securities.

Risk Premium Rate is the extra return over and above the riskfree rate on account of perceived

risk of investment.

The greater the risk of the investment, the higher will be the discount rate to be used and vice-versa.

% **Acceptance Criterion:** Accept the proposal if Risk Adjusted Net Present Value (RANPV) is positive or even zero and reject the proposal if it is negative.

% **Evaluation of RADR:** This approach is simple to compute and easy to understand. Besides, it considers the time value of money and explicitly incorporates the risk involved in the project by making the discount rate as a function of proposal's risk. However, the RADR suffers from basic shortcomings relating to the determination of the risk presence. Moreover, it does not adjust the future cash flows which are risky and uncertain.

Illustration 1: The following details are related to two projects X and Y:

	X	Y
	Rs.	Rs.
Cost of Outlay	20,000	20,000
Cash Inflows		
Year 1	8,000	10,000
Year 2	8,000	12,000
Year 3	4,000	6,000

Riskless rate of return is 5%. Project X is less risky as compared Project Y. The management considers risk premium rates at 5% and 10% respectively appropriate for discounting the cash inflows. State which project is better?

Present value factor of Re. 1 for 1, 2 and 3 year at 10% rate is .909; .826; .751 and at 15% rate is .870; .756; and .658 respectively.

Solution:

Risk Adjusted Discount Rate will be:
Project X = 5% + 5% = 10%
Project Y = 5% + 10% = 15%

Calculation of N.P.V at R.A.D.R

	Project X			Project Y		
Year	Cash Inflows	P.V.F at 10%	Present Value	Cash Inflows	P.V.F at 15%	Present Value
	Rs.		Rs.	Rs.		Rs.
1	8,000	.909	7,272	10,000	.870	8,700
2	8,000	.826	6,608	12,000	.756	9,072
3	4,000	.751	3,004	6,000	.658	3,948
Total risk adjusted present value of cash inflows			16,884			21,720
Less: Initial Investment			20,000			20,000
Net Present Value			-3,116			+1,720

Recommendation: Since the Net Present Value (NPV) of Project Y is positive, therefore Project Y is better than Project X.

13.4.2 CERTAINTY EQUIVALENT APPROACH

Certainty Equivalent approach attempts at adjusting the future cash flows instead of adjusting the discount rate by applying a correction factor called 'certainty equivalent co-efficient' to ensure an element of certainty. Thus, in this method, cash flows are corrected and reduced to conservative levels by multiplying them by certainty equivalent co-efficient.

The certainty equivalent co-efficient or correction factor is defined as the ratio of certain or risk free cashflow to expected or risky cashflow. In brief:

$$\text{Certainty Equivalent Cashflow} = \frac{\text{Riskless Cash flows}}{\text{Risky Cash flows}}$$

The procedure for certainty equivalent approach can be explained as follows:

(1) Estimation of the future cash flows from the proposal. These cash flows do have some degree of risk involved.

(2) The calculation of the certainty equivalent for different years.

(3) The expected cash flows for different years as calculated in (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 which is the rate of interest on Government Securities in the market, to find out NPV of the proposal.

Acceptance Criterion: Using the criterion of the NPV, the project should be accepted, if the NPV is positive, otherwise it should be rejected. The IRR will be compared with risk free discount rate and if it is higher, the project will be accepted, otherwise rejected.

Evaluation of CE Approach: The CE approach clearly recognizes the risk and incorporates it by deflating the cash flows to CE. This approach seems to be conceptually superior to the **RADR** and does not assume that risk increased over time at a constant rate. But the CE approach involves the determination of CE factors which is a difficult task.

Illustration 2: Manish Ltd. employs the certainty equivalent approach in the evaluation of risky investments. The capital budgeting department has processed the following information regarding a new project:

Cost of initial investment Rs. 1, 00,000.

Cash inflows after tax but before depreciation.

Year	Amount	Certainty Equivalent Co-efficient (C.E.C.)
	Rs.	
1	80,000	.8
2	70,000	.7
3	65,000	.6
4	60,000	.4
5	40,000	.3

The company's cost of equity capital is 18%, its cost of debt is 9% and the riskless rate of interest of government securities in the market is 6%. Should the project be accepted?

Discount factors at various rates are given below:

Year	1	2	3	4	5
P.V. Factor at 6%	.943	.890	.840	.792	.747
P.V. Factor at 9%	.917	.842	.772	.708	.650
P.V. Factor at 18%	.847	.718	.609	.516	.437

Solution:

Calculation of NPV of Adjusted Cash Inflows at Riskless Rate (6%)

Year	Cash Inflows	C.E.C.	Adjusted Cash Inflows	P.V.F. at 6%	P.V.
	Rs.		Rs.		Rs.
1	80,000	.8	64,000	.943	60,352
2	70,000	.7	49,000	.890	43,610
3	65,000	.6	39,000	.840	32,760
4	60,000	.4	24,000	.792	19,008
5	40,000	.3	12,000	.747	8,964
					1,64,694
Less: Initial Investment					1,00,000
Net Present Value					

Recommendation: The project should be accepted because the net present value (NPV) is positive.

13.3 PROBABILITY APPROACH

Probability means the likelihood of the happening of an event. When an event is bound to happen, it may be said that is has a probability of 1 and if it is certain that the event will not occur at all it will have a zero probability. As such, ***the probability will always lie between 0 and 1.***

Under this method, the probability of occurance of a particular cash inflow estimates should be assigned to that estimate. The cash inflows estimates should then be multiplied by the probabilities assigned to them and the resultant figures are known as **expected monetary values.** These expected monetary values are then discounted at a given rate to provide present values and NPV.

Evaluation of Probability Approach: This method has a wider application to the problem of portfolio selection of securities i.e. optimum combination of shares, bonds, government securities and other financial instruments. However, this method has a limited application. It can be applied only if a large number of similar investments are to be under taken and if one project fails to yield the expected return, others fare so well that the loss is more than compensated, as it happens in the case of insurance policies.

Illustration 3: Shree Ltd. has given the following possible cash inflows for two of their projects X and Y, out of which one has to be selected. Both the projects will require an equal investment of Rs. 10,000.

	Project X		Project Y	
Possible Events	Cash Inflows	Probability	Cash Inflows	Probability
	Rs.		Rs.	
A	8,000	0.1	24,000	0.10
B	10,000	0.2	20,000	0.15
C	12,000	0.4	16,000	0.50
D	14,000	0.2	12,000	0.15
E	16,000	0.1	8,000	0.10

Which project should be selected for investment?

Solution:

	Project X			Project Y		
Possible Events	Cash Inflows	Probability Values	Expected Values	Cash Inflows	Probability Values	Expected Values
	Rs.		Rs.	Rs.		Rs.
A	8,000	0.1	800	24,000	0.10	2,400
B	10,000	0.2	2,000	20,000	0.15	3,000
C	12,000	0.4	4,800	16,000	0.50	8,000
D	14,000	0.2	2,800	12,000	0.15	1,800
E	16,000	0.1	1,600	8,000	0.10	800
Expected Monetary Values			12,000			16,000

Recommendation: The expected monetary values of project Y are Rs. 16,000; therefore it should be selected for investment. Its Net Present Value (NPV) is also 6,000 (Rs. 16,000 – Rs. 10,000).

13.4.4 STANDARD DEVIATION

In the **context of capital budgeting, standard deviation is the measure of variability of cash flows from the expected cash flows. A project having larger standard deviation will be more risky as compared to the one having smaller standard deviations.** The formula for calculating standard deviation in the probability distribution is given below:

Standard Deviation or $\sigma = \sqrt{\sum pd^2}$

Where *d* is the deviation of each of the cash flows from the mean i.e. from the expected cash flows and *p* is the associated probability.

The following steps must be taken into consideration while calculating standard deviation:

- At first, the mean value of possible cash flows should be computed.
- Find out the deviation between the mean value and the expected cash flows.
- Deviations are squared.
- Finally, make a total of the weighted squared deviations and find out their square root that will be known as standard deviation.

Illustration 4: From the following information, ascertain which project is more risky on the basis of standard deviation:

Possible Events	Project A		Project B	
	Cash Inflows	Probability	Cash Inflows	Probability
	Rs.		Rs.	
A	2,000	.2	2,000	.1
B	4,000	.3	4,000	.4
C	6,000	.3	6,000	.4
D	8,000	.2	8,000	.1

Solution:

Project A **Calculation of Standard Deviation**

Possible Events	Cash Inflows Rs.	Deviation from Mean (d) [5,000]	Square of Deviations ($d^{2)}$	Probability p	Weighted Square Deviations ($pd^{2)}$
A	2,000	-3,000	90,00,000	.2	18,00,000
B	4,000	-1,000	10,00,000	.3	3,00,000
C	6,000	+1,000	10,00,000	.3	3,00,000
D	8,000	+3,000	90,00,000	.2	18,00,000
				? pd^2	42,00,000

Standard Deviation or σ = **??** pd^2

= **?**42,00,000

= 2,050

Project B **Calculation of Standard Deviation**

Possible Events	Cash Inflows Rs.	Deviation from Mean (d) [5,000]	Square of Deviations ($d^{2)}$	Probability p	Weighted Square Deviations ($pd^{2)}$
A	2,000	-3,000	90,00,000	.1	9,00,000
B	4,000	-1,000	10,00,000	.4	4,00,000
C	6,000	+1,000	10,00,000	.4	4,00,000
D	8,000	+3,000	90,00,000	.1	9,00,000
				? pd^2	26,00,000

Standard Deviation or σ = **??** pd^2

= **?**26,00,000

= 1,612

Recommendation: As the standard deviation of Project A is more than that of Project B,

Recommendation: As the standard deviation of Project A is more than that of Project B, therefore Project A will be more risky.

13.4. 5 CO-EFFICIENT OF VARIATION

Standard deviation is an absolute measure of variability and is not a suitable comparison criterion when the investment proposals involve substantially varied cash outlays and mean or expected values. To overcome this problem, relative measure of dispersion or variability is used.

The relative measure of variability is the ratio of the absolute measure of variability to the appropriate

average and is expressed as percentage. The relative measure of dispersion based on standard deviation is called Co-efficient of Standard Deviation or Co-efficient of Variation. In other words, ***Co-efficient***

13.4.6 DECISION TREE ANALYSIS

Decision tree analysis approach is particularly applicable where decision at a point of time affects decisions at a subsequent date i.e. current investment decision has implication against future investment decision. In other words, ***the investment decisions involve a sequence of decisions over time.*** When different possible events are represented on a diagram at different points, the diagram looks like a group of branching out stems. That is why the method is known as 'decision tree analysis'.

Thus, a decision tree analysis may be defined as a graphic display of the relationship between a present decision and future events, future decisions and their consequences.

Construction of a Decision Tree

While constructing a decision tree, the following steps should carefully be considered:

(1) **Definition of the Proposal:** The investment proposal should be defined. The proposal may be to enter a new market or to produce a new product.

(2) **Identification of Alternatives:** The decision alternatives should be defined. For example, a company is considering purchasing a plant for manufacturing a new product. The alternatives may be to install a new plant, a medium size plant, a small plant initially and expand it later or no plant. Each alternative may have different consequences.

(3) **Graphing the Decision Tree:** the decision tree is then graphed indicating (a) decision points; (b) decision branches; and (c) other data.

(4) **Forecasting Cash Flow:** The relevant data such as the projected cash flows, probability distributions, the expected present value etc. should be located on the decision tree branches for the purpose of taking decisions.

(5) **Evaluating Results:** After ascertaining the expected value for each decision, the results are analysed and the best alternative should be selected.

13.5 Summary

All the technique of capital budgeting require the estimating of future cash inflows and cash outflows. All the elements of uncertainty have to be taken into account in the from of forcible risk while taking a decision about investment proposal. It is peshaips the most difficult task while making on investment decision. But some allowara for the element of risk have to be provided. The various methods have been suggested for accounting for risk in capital budgeting are certainty Equivalent Approach Risk adjusted Discount Risk Probability approach standed Deviation co-efficient of variation and decision tree analysis.

13.6 Key Words

- **Capital Budgeting** or capital expenditure decision is the total process of generating, evaluating, electing and following up of capital expenditure alternatives.
- **Mutually exclusive decision** relate to two or more alternative proposals, when acceptance of

one alternative proposal results in automatic rejection of all other alternatives.

- **Cash Flows** refer to cash revenue minus cash expenses or cash oriented measures of return generated by a proposal.
- **Cash Inflows** (annual) refer to the annual net income (profits) before depreciation and after tax.
- **Net Present Value** is the difference between the present value of cash outflows discounted at the firm's cost of capital.

13.7 Self Assessment Test

1. How is risk assessed for a particular investment by using a probability distribution? Take a simple example to discuss the method.
2. Describe the decision tree approach with the help of an example. How is this technique is useful in capital budgeting?
3. . Due to a considerable risk inherent in a project costing an initial cash outflow of Rs. 20,000 a firm decides to use certainty equivalents to evaluate the project. The certainty equivalents have been estimated to be 0.8, 0.7, 0.6, 0.5 and 0.4 in a period of 5 years. The risk free rate of interest is 10%. The expected values of cash inflows are given below:

Years	1	2	3	4	5
Cash Inflows (Rs.)	5,000	8,000	4,000	6,000	12,000

You are required to advice the firm whether its management should accept the project?
Present value of Re. 1 for 5 years at 10% interest is: .909; .826; .751; .683 and .621 respectively.

UNIT - 14 : DIVIDEND POLICY

Unit Structure

14.0 Objectives

After studying this unit, you should be able to understand:

- The concept and froms of dividend
- The forms of dividend
- Important dividend related dates
- The concept of dividend policy and factors affecting dividend policy
- Theories of dividend policy
- Bonus Issue, Stock Split , Reverse Stock Split and Share Repurchase
- Dividend Policy in practice in India.

14.1 Introduction

Earnings are the profits of a company. Investors and analysts consider earnings an important measure to determine the attractiveness of a particular stock. Companies with poor earnings, current and prospective, will more often than not have lower share prices than those with good prospects. There is no doubt that a company's ability to generate profit in the future plays a very important role in determining a stock's price. What a company does with its profits also impacts the value of its share.

One of the major decision areas in financial management relates to dividend policy. The dividend policy decision involves the choice between distributing the profits(to the shareholders and retaining them with the firm. A firm may either pay dividends to its investors resulting in increase in Shareholders' current income or retain the profits for lucrative investment opportunities resulting in future gains. Management and the board of a company may be of the view that the money earned by the firm is best re-invested into the company: research and development, capital investment, expansion, etc. Proponents of

this view suggest that an eagerness to distribute dividends to shareholders may indicate the inability of the managers to come up with good ideas and plans for the future growth of the company. Some studies, however, have demonstrated that companies that pay regular dividends have higher earnings growth, suggesting that dividend payments actually signal the confidence of the management in earnings growth and profitability to fund future expansion. Ultimately, the decision to pay dividend or not is influenced by whether it leads to an increase in the shareholder's wealth and to what extent. In fact, whether a company pays dividends or retains its earnings to reinvest in future depends on a number of factors. One of the longest running and the most debated issues in the corporate finance has been whether a company's decision about its amount of dividend has any impact on the value of its stock. In this unit, we shall discuss dividend, forms of dividend, types of dividend, measures of dividend, dividend policy and factors affecting dividend. We shall also briefly study the legal and regulatory requirements for dividend declaration and payment by the Indian firms. At the end of the unit, we shall take a look at the dividend practices in India.

14.2 Dividend and Dividend Policy

Once a company makes profit, it has to decide on what to do with that profit. It can decide to retain the profits within the company, or pay out the profits to the owners of the firm in the form of dividends. Once the company decides on whether to pay dividends, it may want to establish a somewhat permanent dividend policy, which may in turn impact investors' and analysts' perceptions of the company in the financial markets. What the company decides depends on the situation of the company now and in the future. It also depends on the preferences of the existing and the potential investors.

The profit of a company when distributed among its shareholders is called **dividend**. The word "dividend" comes from the Latin word "dividendum" meaning "thing to be divided". It is a portion of a company's earnings paid out to the existing shareholders. The dividend may be as a fixed annual percentage of paid up capital as in the case of preference shares or it may vary according to the profit of the company as in the case of ordinary shares. Dividends may be in the form of cash, shares, or property. Dividend is often referred to in terms of the rupee amount each share receives and this amount is called DPS or dividend per share. It may also be quoted in terms of a percentage of the current market price that is referred to as dividend yield. Most secure and stable companies offer dividends to their stockholders. High-growth companies rarely offer dividends because they reinvest their profits back into the company to help sustain growth. Thus, whether a company pays dividend or not depends on a number of factors including the stage of life cycle it is at. Dividends are mainly of two types:

Final Dividend

The final dividend is the dividend paid after the finalization of the accounts of the company. This amount is calculated after all financial statements are ready and the directors are aware of the company's profitability and financial health. It is proposed by the board of directors and approved by the shareholders in the annual general meeting. It is generally paid in cash as a percentage of paid up capital.

Interim Dividend

If the Articles so permit, the directors may decide to pay dividend at any time between two annual general meetings, before the finalization of the accounts. It is generally declared and paid when a company has earned heavy profits or abnormal profits during a year. Such payment of dividend in between the two annual general meetings before finalizing the accounts is called Interim Dividend. It is paid in cash.

Apart from the above, there is another type of dividend called '**Special One-Time Dividend'.** In addition to the regular dividends, a company may, at times, pay a special one-time dividend. These are rare and can occur for a variety of reasons such as the sale of a business or liquidation of an investment. Such dividends can take the form of cash, stock or kind.

The decision for paying a dividend to the shareholders is taken by Board of Directors and is generally confirmed in the annual general meeting of the shareholders. The dividend can be declared only out of profit that remains after setting off all the expenses, transferring a reasonable amount of profit to reserve fund and providing for depreciation and taxation for the year. It means if there is no profit in a particular year, no dividend shall be distributed that year. The shareholders cannot demand dividend from the company. It is solely the discretion of the directors to decide to pay or not to pay dividend to the shareholders. Firms may follow different dividend policies as per their choice. Various factors have a bearing on the dividend policy a firm follows.

14.3 Forms of Dividend

Companies can pay dividends in a number of ways. The dividends are paid mainly in cash but there are other forms also including stock and property dividends. Dividend can be classified into different forms according to the mode of its distribution:

Cash Dividend

This is the most basic form of dividend that is paid out in currency, usually via electronic funds transfer or a printed paper cheque. Cash dividends are considered a type of investment earnings and are usually taxable to the recipient in the year they are paid. However, whether cash dividends are taxable or not, depends on the taxation laws of the country the firm is operating in . This is the most common method of sharing profits with the shareholders. For distributing cash dividend, the company declares the money to be for each share owned by the shareholder. Thus, if a person owns 100 shares and the cash dividend is ` 0.50 per share, the holder of the stock will be paid ` 50 as dividend.

Stock Dividend

Stock dividend is given in the form of bonus shares or stocks of the issuing company. Normally, they are offered on the basis of a pro rata allotment. Basically this involves issue of additional shares to existing shareholders at no additional cost. Therefore, the total cost of the shareholder remains the same but the cost per share held is reduced. For example if a shareholder owns 100 shares at a price of ` 10 each, the total cost is ` 1000. After a 5% stock dividend, the total cost remains the same at ` 1000 but since the number of shares has gone up to 105, the cost per share comes down from ` 10 to ` 9.52.

Stock dividend increases the total number of outstanding shares while lowering the price of each share without changing the market capitalization, or total value, of the shares held. One of the more interesting theories of corporate dividend policy is that management of a firm should choose stock dividends over all other forms of dividend. Bonus shares can satisfy investors looking for capital gains as well as the investors seeking current income. The investors that want their earnings retained in the business can hold on to the additional stock paid out to them as bonus shares and investors that want current income can sell the shares they receive from the stock dividend and pocket the cash.

Bond Dividend

Dividend may also be given in the form of debentures or bonds or notes for a long-term period,

issued to the existing shareholders. This form of dividend is used in rare instances. In this form of dividend, the shareholders become the secured creditors of the company as the bonds have a lien on the assets of the company.

Property Dividend

Sometimes, the dividend is paid in the form of an asset instead of cash. Such ' in kind' distribution of dividend is called property dividend or dividend **in specie** (Latin for "in kind"). Property dividends can take the form of any item with tangible value including assets, products and services and are recorded at market value on the declaration date. However, they are relatively rare.

It is, however, important to note that in India, dividend can be distributed in the form of cash or bonus shares only. Distribution of dividend in any other form is not permissible by the law.

14.4 Important Dividend Related Dates

An investor must be aware of the various dates involved with respect to dividend, because there are many key dates starting from the declaration of dividend by the company to the final payment of the dividend to the existing shareholders. These dates are :

Declaration Date

The declaration date is defined as the date on which the board of directors of the company declare their intention to pay dividend. On this date, the payment date and the record date are also announced. On this day, a liability is created and the company records that liability on its books; it now owes the money to the stockholders.

Ex-dividend Date

The ex-dividend date is defined as the date subsequent to which any share of the company that is traded does not have right to claim the dividend. So if any investor is buying the stock after the ex-dividend date, it will not be entitled to get any dividend, which has been declared in the immediate past.

Record Date

The record date is defined as the date on or before which the shareholders who have officially recorded their ownership are entitled to get the dividend. In other words, the record date is the date on which the shareholders who have shares are entitled to get the dividend.

Payment Date

The payment date is defined as the date on which the dividend declared in the immediate past is electronically transferred or dispatched in form of cheque to the shareholders .

To understand Ex – Dividend, Record Date, and Declaration Dates better, let us take the example of Oil India Limited's Final Dividend. The first relevant date, **Declaration Date,** is the date on which the dividend is announced on the recommendation of the Board of Directors and it is still subject to the shareholders' approval. In our example, Oil India's dividend was recommended on May 26 2010, when it was announced that the company would pay a dividend of ` 16 per share, subject to its approval by the shareholders of the company in their AGM. The AGM was held on 25th September where the dividend was approved by the shareholders.

Now the question arises as to who gets the dividend? This is a very pertinent question because the shares are traded throughout the year, and the ownership of the share keeps changing hands with every trade. So it becomes essential to fix a date, and say that whoever owns the shares on that particular date will be entitled to the dividend announced by the company. This is called the "Record Date", and in our example it is 25th September 2010. Therefore, whosoever has their name in the company's books on 25th September 2010 will receive ` 16 as dividend per share.

In this context, there is yet another date, which is called the "ex-dividend date". This date is important because there is a time gap between the purchase of shares and when it gets recorded in the company's books in the name of the new owner. So if somebody buys Oil India shares on 25th September 2010, his name will not appear in the books of the company on 25th itself, and he will not get the dividend despite owning the share. To become entitled to get dividend, you need to buy the share before the ex-dividend date because that would ensure that there is enough time for your name to be registered in the company's record, and enable you to receive the current dividend announced by the company.

In this case, the ex-dividend date was 16 September 2010. This was much earlier than the 25th September 2010 (Record Date) because the company closed its books from 18th September to 25th September 2010. So, if you want to buy a share for its dividend, then make sure you purchase it before the ex-dividend date. Payment date is the last relevant date in reference to the dividends. It is the day dividend payment is dispatched to the shareholders.

14.5 Factors Affecting Dividend Policy

Allocation of earnings between dividends and retained earnings is an essential part of management decision and it requires the formulation and execution a sound dividend policy. There is no definite answer to the question as to what should the quantum of dividend be every year. A number of factors affect it and the final figure of dividend is determined only after considering the combined effect of all those factors. Factors affecting Dividend Policy may broadly be divided into:

(a) External Factors

(b) Internal Factors

External Factors Affecting Dividend Policy

General State of Economy: Business cycle and economic uncertainty may have an impact on the dividend decision of a firm since the Dividend policy usually needs to be adjusted according to the business oscillations. For example in case of uncertain economic conditions, the management may like to retain whole or large part of earnings to build up reserves to absorb future shocks and preserve the firm's liquidity position.

State of Capital Market: Since dividend decision is related to equity shares, the state of capital markets also has a bearing on it. A favourable market can lead to a liberal dividend policy since it is relatively easy to raise fresh equity whereas an unfavourable market leads to a conservative dividend policy.

Contractual Restrictions: Lending agencies sometimes put restrictions on the dividend payments to protect their interests especially if the firm is experiencing liquidity issues. For example: a loan agreement may specify that the firm shall not declare any dividend so long as the liquidity ratio is less than 1:1 or that the firm will not pay dividend more than 22% so long as it does not repay the

complete loan.

- **Government Policies:** The earning capacity of any company is affected by the changes in fiscal, industrial, labour and other government policies. Sometimes government imposes restrictions on the distribution of dividend beyond a certain percentage in a particular industry or in all industries in case of emergency and thus, the firms need to modify or formulate their dividend policy accordingly.
- **Taxation Policy :** High taxes imposed on firms reduce their earnings and consequently the rate of dividend is lowered. Sometimes government levies dividend-tax on distribution of dividend beyond a certain limit. So the dividend payout has to be adjusted to it. In India, Companies declaring or distributing dividend, are required to pay a Corporate Dividend Tax in addition to the tax levied on their income. Dividend received is exempt in the hands of the shareholder's, in respect of which Corporate Dividend Tax has been paid by the company.
- **Legal Requirements** : The directors of a company have to take into consideration the legal requirements specified by the Companies Act ,1956 while determining the dividends to be distributed. In order to protect the interests of the creditors and outsiders, the act prescribes certain guidelines in respect of the distribution and payment of dividend that have to be strictly followed by the company.
- **Dividend Policy of Rival Organisations :** Since a company's performance is compared with the other firms in the industry, it is essential for any company to take into account the dividend policy of the rival firms before deciding its dividend payout.

Internal Factors Affecting Dividend Policy

- **Type of Business:** The type of business carried on by the company influences its dividend policy. If the company is in a business that has a stable demand leading to stable earnings, it can follow a stable dividend policy. However, if a company fluctuating demand and irregular flow of income, it cannot adopt a steady dividend policy. Usually, firms dealing in necessities suffer less from oscillating demand and earnings than those dealing in luxuries or fancy goods.
- **Age of Corporation:** Age of the firm is also a significant factor in deciding the dividend policy. A newly established company may require much of its earnings for expansion and improvement and may have to adopt a rigid dividend policy to retain most of its earnings while, on the other hand, an older company can formulate a more consistent dividend policy.
- **Liquidity Position**: As per the provisions of Companies Act ,dividend is payable in cash. Hence, the directors need to take into account the liquid position of the firm before declaring dividend. Since dividend represents a cash outflow, availability of cash and sound financial position is an important factor in dividend decisions.
- **Current Year's Earnings:** A company has to determine the amount of dividend to be distributed in a year keeping in view the actual earnings of that year. Even the companies following stable dividend policy tweak their payout within a certain limit on the basis of current year's profit. It is a fact that the upper limit on dividends is fixed by the earnings of the current year.
- **Estimate of Future Earnings:** No company can adopt a stable dividend policy or otherwise without taking into consideration the estimates of earnings expected in the future. If the earnings

are projected to rise in future, the directors can think of raising the current dividend. If the future is not so bright, the current dividend is adversely affected, as any rational dividend policy cannot ignore the fluctuations in earnings from year to year.

- **Past Dividends:** While formulating the Dividend Policy, the directors must keep in mind the dividend paid in past years because the shareholders do expect that the company would pay a dividend that is at least equal to the past dividends , if not more. Of course, if the circumstances change, a departure has to be made from the past trend of dividend distribution. But under normal circumstances, directors are reluctant to reduce the previous year's rate of dividend .
- **Nature of Ownership of Shares :** The distribution pattern of the shares also affects the dividend decisions. A closely held company is likely to get the consent of the shareholders for the suspension of dividend or for following a conservative dividend policy. However, in case the shareholding is widely distributed, with a large number of shareholders, it would be difficult for the Board to take decision of reducing or suspending dividend.
- **Need for Additional Capital:** The current profit is divided into retained earnings and dividend. Companies retain a part of their profits for strengthening their financial position and meeting the increased requirements of working and fixed capital. Particularly small companies and newly established companies that find it difficult to raise finance for funding growth and expansion programmes, tend to plough back most of their profits. and distribute dividend at low rates. Thus, firms that anticipate need for additional capital in the near future tend to follow a low dividend payout policy.
- **Ability to Borrow:** Firms need funds for growth and expansion. Well established firms can access the capital markets and raise funds easily for their investment projects.Such firms are at a liberty to pursue a more liberal dividend policy. However, new Companies and smaller firms may find it difficult to borrow funds from the external sources if need arises. Such firms have to depend on their internal sources for funding their investment plans and therefore they need to build up good reserves by reducing the dividend pay out ratio.
- **Shareholder Preference for Current Income versus Capital Gains:** Depending on the tax structure, the shareholders of a company may have a preference for a high/low dividend policy. Here a trade-off between taxes on dividends and taxes on capital gains is an important part of the equation determining whether shareholders seek current income (if tax rate on dividend is lower than capital gains) or capital gains (if tax rate on dividend is higher than capital gains). However, its is difficult to state that this will always be the case.
- **Signaling Effect:** Another factor affecting dividend policy is the information content of the dividends. This means that a company's management uses its dividend policy to signal investors about how the company is really doing. As the insiders of the company, the directors are privy to a lot of information about future earnings and cash flow that the outsiders might not know. Therefore, a company's decision to initiate, maintain, increase or cut a dividend can convey a lot about its future prospects.
- **Policy of Control:** If the directors want to have more control over the company, they would not like to add new shareholders to raise additional equity capital because by adding new shareholders there will be a dilution of control of the existing management. So the directors would prefer to meet the fund needs through retained earnings leading to a low dividend payout. If the directors are

not bothered about the control of management, they will follow a liberal dividend policy. Thus management control is also a significant factor in framing the dividend policy.

- **Attitude of Management:** A management with conservative attitude would declare lower dividend and retain major part of the profits to strengthen firm's financial position and meet contingencies whereas a management with liberal attitude would be less rigid in its dividend policy. A Prudent management would always adopt a middle path in devising its dividend policy.

To sum up, a company's dividend policy is dependent on a number of factors that are interrelated and dynamic. Some factors are quantifiable and the others are non-quantifiable and their combined effect cannot be concluded through quantitative analysis only. Sound dividend policy decision needs a qualitative analysis of various factors in order to achieve a balance between multiple conflicting interests to achieve firm's ultimate aim of maximizing shareholders wealth.

14.6 Theories of Dividend Policy

Dividend decision by any company is an important issue that is addressed by its management. The crucial point is to determine how much profit is to be distributed to the existing shareholders i.e. determining the dividend pay out ratio and how much amount is to be retained in the firm i.e. determining the retention ratio. Thus dividend policy is actually a dividend payout policy which is a strategy that companies follow in deciding the amount and timing of dividend payments over a period of time to their shareholders. There are various theories of dividend policy that shall be discussed in this section.

Residual Theory of Dividend Policy

The essence of the residual theory of dividend policy is that the company will only pay dividends from residual earnings, that is, from earnings left over after all suitable investment opportunities have been financed. It is perhaps the most logical policy according to which dividends are payments made from earnings left after taking away the funds necessary to finance the equity portion of the company's capital budget. As per this policy, the main focus of the management is on investment, not dividends. Dividend policy becomes irrelevant; it is treated as a passive rather than an active, decision variable. The theory supports the view that the value of the firm and the wealth of its shareholders will be maximized by investing the earnings in the appropriate investment projects (positive NPV projects), rather than paying them out as dividends to shareholders. Dividends will only be paid when earnings exceed the funds required to finance the investment projects of the company. Thus, this theory regards dividends payout as a function of financing decision of a firm.

Let us take example of a company named ABC Ltd. to understand this theory. Suppose the company has recently earned ` 1,000 and has a policy to strictly maintain a debt/equity ratio of 0.5. If this company has a project with a capital requirement of ` 900, it will use its earnings for funding this investment project. In order to maintain the debt/equity ratio of 0.5, ABC will have to fund one-third of this project (` 300) by using debt and two-thirds (` 600) by using equity. This means that the company will borrow ` 300 and use ` 600 from its earnings to maintain the 0.5 debt/equity ratio. Such investment will leave a residual amount of ` 400 from the current earnings to be distributed as dividend. On the other hand, if the project has a capital requirement of ` 1,500, the debt requirement will be ` 500 and the equity requirement will be ` 1,000, leaving no residue for dividends. If any project requires an equity portion that exceeds the company's earnings, then it will have to issue new stock.

Advantages of Residual Dividend Approach

The basis of residual dividend policy is very sound since it is intuitively appealing to use earnings to maintain and grow the business. Retaining the earnings for investments reduces the need to raise fresh capital, thus saving on associated issues and floatation costs. Further, if the effective rate of tax on dividend income is higher than the tax on capital gains, many shareholders, because of their personal tax liabilities, may prefer this policy.

Disadvantages of Residual Dividend Approach

The biggest disadvantage of the residual dividend policy is that it results in widely fluctuating dividends. Since dividends are a residue, they are impacted by the varying earnings pattern of the company and the highly dynamic investment inputs. This uncertainty about future dividends adversely affects the risk perception of the investors, thereby increasing their required rate of return and decreasing the expected value of shares.

Stable Dividend Policy

A company may follow anyone of the following three types of dividend policy:

Strict or Conservative Dividend Policy

This envisages the retention of profits at the cost of dividend payout. It helps in strengthening the financial position of the company but may leave the shareholders a little dissatisfied.

Lenient or Liberal Dividend Policy

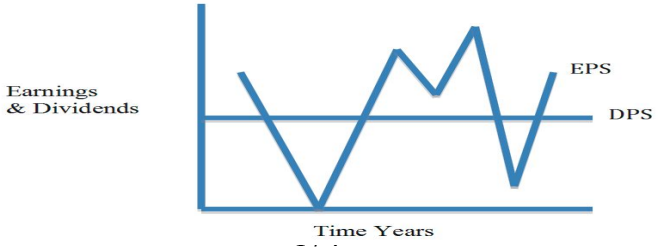
This policy allows the company to pay dividend at the maximum rate possible taking in view the current earnings of the company. Under such policy, company retains the minimum possible earnings. As is obvious, as a policy may leave company with little or no retained earnings.

Stable Dividend Policy

This policy suggests a mid-way between the above two policies. Under this policy, stable or almost stable rate of dividend is maintained. Many firms and their shareholders prefer more stable dividends than the residual approach allows. Stable dividend means that the company pays a certain minimum amount of dividend regularly. Companies that follow the policy of stable dividends are more likely to forecast their long-run sustainable earnings in determining their dividend policy. In addition, with inflation changing the way it is, dividend stability has actually come to mean stability in the rate of increase in dividend. The stable dividend may take the following forms:

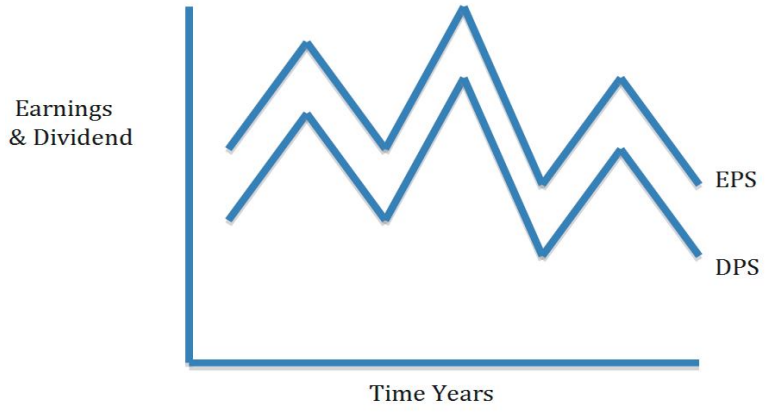
Fixed Amount Per Share or Constant Dividend Per Share

Under this policy, a company pays a fixed amount of dividend per share year after year, irrespective of any changes in its earnings. However, this does not imply that the company would pay the same amount of dividend from all future annual earnings. If the earnings of the company rise and if the management feels that higher level of earnings is sustainable for a long period of time, they can increase the amount of dividend per share.



Constant Pay-out Ratio

Under this policy, a fixed percentage of net earnings is paid every year as dividend to shareholders. This would mean that the amount of dividend paid each year would not remain constant, but will fluctuate in proportion to the earnings of the company. This policy simplifies the dividend decision and protects the company against over or under payment of dividend.



Regular plus Extra Dividend Policy

Under this policy, a firm will continue to adhere to one of its stable dividend policies and pay regular dividends year after year. But when the earnings exceed the normal level, the directors would pay extra dividend in addition to the regular dividend. But it will be named 'Extra dividend', so that there is no confusion that the company has enhanced the rate of regular dividend

There are reasons why companies and investors prefer stable dividend policy. Main reasons are:

(1) Desire for Current Income: There are many income conscious investors who desire to get stable current income to meet their living expenses. They prefer to invest in shares of those companies that pay regular and stable dividend and would be prepared to pay a little high price for shares of such companies.

(2) Removes Investors' Uncertainty: Such policy increases confidence among shareholders. A regular and stable dividend payment may serve to resolve uncertainty in the minds of shareholders, as the company does not cut the dividend rate even if its profits are lower. Stable dividend represents an expectation of a bright future of the company and thus the goodwill of the company increases in the eyes of the investors. Thus, the changes or no changes in dividends acts as a source of information about firm's profitability and health.

(3) Ease in Raising Additional Finance: The credit standing and prestige of the company paying stable dividend increases in the eyes of the investors so when the company wants to raise additional finance, investors would be willing to buy its shares or debentures.

(4) Requirements of Institutional Investors: A stable dividend policy attracts investments from institutional investors who generally invest their surpluses or their long term funds in companies having a track record of stable dividends. Such financial institutions have a lot of impact in the financial markets. If they invest their funds in a company, the market price of the shares of that company would increase, enhancing the shareholders' wealth.

(5) Sufficient Retained Earnings: A company paying a reasonable proportion of stable dividend is able to retain an appreciable amount of profit with it, which it can plough back in the business for

growth and expansion.

(6) Stable Share Prices: Other things beings equal, the market price of a share varies with the rate of dividend the company declares on its equity shares. The value of the shares of a company having a stable dividend policy usually does not fluctuate widely even if the earnings of the company turn down. Thus, this policy buffers the market price of the stock of a company to a certain extent.

(7) Enhances Management Efficiency: As stable dividend policy implies regular payment of dividend, the company has to make profits every year else it would come in a very difficult position. This makes the management more conscious towards their duties and leads to more efficient management.

14.7 Companies Act and Payment of Dividend

The declaration and payment of dividend is an internal matter of the company and is governed by its Articles. The power regarding appropriation of profits is given to the Board of directors, but while designing a dividend policy for their company, they need to consider the legal and statutory framework as the dividend policy is often constrained by legal and contractual factors.

In India, several restrictions have been imposed on companies in respect of the payment of dividend. These provisions regarding the amount and procedure for dividend payment are contained in section 205,205A, 206,206A and 207 of the Companies Act, 1956. These provisions may be summed up as follows:

A Company can pay dividends to its existing shareholders only after sufficient provision has been made for the redemption of preference shares, if any and also that sufficient depreciation has been provided as per the provisions of the Companies Act, 1956. All dividends must be paid in cash only with the exception of stock dividends or bonus shares. Further, the cash dividend may be paid either as final dividend which is payable after recommendation of the board of directors and approval of the shareholders at the annual general meeting of the company and /or interim dividend which is payable after passing a resolution by the Board of Directors even before the finalization of accounts for that year. The Companies Act, 1956 does not provide for payment of interim dividend and therefore, a company can pay interim dividend only if authorized by the Articles of Association of the Company. The Act also specifies that dividend is payable only out of the current year profits of the company. However, in certain cases, dividend can also be paid out of accumulated profits in case of inadequate or no current year profit. The prescribed rules framed by the Central Government in this respect are known as the Companies (Declaration of dividend out of reserves) Rules, 1975.

14.8 Measures of Dividend

There are two main measures of dividend:

Dividend Payout

It measures the percentage of earnings that a company pays in dividends ((and it is calculated by dividing dividends with earnings. The higher the DPO ratio, the lower will be the retention ratio and vice-versa. This ratio is important in projecting the growth of company because its inverse, the retention ratio can give us an insight into the company's investment and growth plans.

DPO =Dividends/Earnings.

Let us go back to our imaginary company, ABC Ltd. Suppose the PAT of ABC Ltd. for a given year is ` 100 lakhs and it pays ` 50 lakhs as dividend for that year, then its DPO ratio is 50%.

Dividend Yield

It measures the return that an investor can make from dividends alone (and it is calculated by dividing dividends with stock price. It is related to the market price of the share and tells the investor how much he is earning on his stock from dividend alone based on the current market price. By calculating dividend yield, the investors can know and compare the amount they earn, annually in cash, from each share held by them.

DY= Dividends / Stock Price

Let us suppose that the market price of the stock of ABC Ltd. is ` 4000 and the dividend is ` 50, then the dividend yield is 1.25%.

14.9 Bonus Issue, Stock Split, Reverse Stock Split and Share Repurchase

Bonus issues, stock splits, reverse stock splits and share repurchases have an effect on the shares held by a company's shareholders and hence on the dividends. So we need to understand each of these clearly. As already discussed, a company may issue additional shares to its existing shareholders without charging anything from them. Such an issue of shares constitutes stock dividend and a share thus issued is called "bonus share". A company may also opt to split its existing shares into more shares. This is known as 'stock split' and it is similar to stock dividend in that each shareholder gets more shares but there is no change in her/his percent ownership in the company. Though less popular, a company may also undertake reverse stock split, which reduces the number of outstanding shares, but there is no change in the underlying fundamentals. Share repurchase or buyback is a transaction in which a company buys back its own shares.

Bonus Issue

A bonus share is a free share issued to existing shareholders of a company, based upon the number of shares that they already own at the time of announcement of the bonus issue. These shares are issued to the existing shareholders by converting share premium account or free reserves into equity capital without taking any consideration from the shareholders. A company builds up its reserves by retaining a part of its profit over the years (the part that has not been distributed as dividend). After a while, these free reserves increase, and the company may decide to issue bonus shares and convert a part of these reserves into equity capital. Bonus issue increases the number of outstanding shares so the earnings of the company will have to be divided by the increased number of shares, reducing the earnings per share (Earnings per Share = Net Profit/ Number of Shares). However, the decrease in EPS is compensated by the fact that each shareholder now owns more shares. Theoretically, the stock price should also decrease in proportion to the number of new shares. But, in reality, this might not happen. A bonus issue is a sign that the company is in a position to service larger equity and that the management is confident of being able to increase its profits and distribute dividends on the increased number of shares in the future.

To understand the mechanism of issue of bonus shares better, let us consider a hypothetical company and shareholder. Suppose Mr. Sharma holds 100 shares of XYZ Ltd. When a 1:1 bonus offer is declared, he becomes entitled to receive 100 shares free. This means his total holding of shares in that company will now be 200 instead of 100 at no cost and if the price of that share before bonus is ` 100,

then ex-bonus share price will theoretically adjust to ` 50, which means that the total market value will remain the same.

Bonus issue has following major effects:

- Share capital and the number of shares outstanding increase i.e. a dilution in equity takes place
- Liquidity in the stock increases
- Earnings per share, Book Value and other per share values get reduced
- Markets view the issue of bonus shares as a favourable event
- Market price gets adjusted after the issue of bonus shares
- Accumulated profits get reduced
- No cash inflow or outflow takes place
- A bonus issue is taken as a sign of the good health of the company

The company announces a record date for the issue, whenever a bonus issue is announced. The record date is the date on which the bonus takes effect, and shareholders on that date are entitled to the receive bonus shares. After the announcement of the bonus but before the record date, the shares are referred to as cum-bonus and after the record date, the shares become ex-bonus.

Guidelines for the issue of bonus shares

Bonus shares are issued by converting the reserves of the company into share capital. It is nothing but capitalization of the reserves of the company. There are some guidelines for Bonus issue in Chapter XV of SEBI (Disclosure & Investor Protection) Guidelines, 2000 which need to be followed in deciding the correct proportion of reserves to be capitalized by issuing Bonus Shares. There are some conditions that need to be satisfied before issuing Bonus shares:

- A company can issue bonus shares only if its Articles of Association authorize a bonus issue. Where there is no such provision in the articles, they must be amended by passing special resolution at the general meeting of the company.
- The bonus issue must be sanctioned by the shareholders in general meeting on the recommendations of the BOD of company.
- Guidelines issued by SEBI must be complied with. Company must ensure that issue of bonus shares does not lead to total share capital in excess of the authorized share capital. If it so happens then the authorized capital must be increased by amending the capital clause of the Memorandum of association.
- If the company has taken any loan from any financial institution, it has to obtain that institution's prior permission for the issue of bonus shares.
- If the company is listed on the stock exchange, it has to inform that SE of the decision of the board to issue bonus shares immediately after the board meeting.
- If the bonus shares are to be issued to the non-resident members, prior consent of the Reserve Bank should be taken.

- Only fully paid up bonus share can be issued.

Stock Split

A stock split is a corporate action that increases the number of shares of a public company. This requires approval from the board of directors and shareholders. The price of the share is so adjusted that the market capitalization of the company remains the same as it was before the split. When a company announces stock split, its existing shares are divided into multiple shares as per the ratio of split declared. A stock may split two for one, three for two, or any other combination. For example, if you own 25 shares of ABC Ltd. at ` 15 per share, and there is a 2-1 stock split, you will own 50 shares worth ` 7.50 each after the split is effective.

Although the number of shares outstanding increases with the split, the total rupee value of the shares remains the same compared to pre-split amounts, because no real value is added as a result of the split. The proportionate equity of each shareholder also remains unchanged. Unlike new share issue, a stock split does not dilute the ownership interests of existing shareholders.

A company whose stock is performing well may choose to split its shares, distributing additional shares to existing shareholders. One of the main reasons why stock splits are performed is that a company's share price has grown so high that to many investors, the shares are too expensive to buy. Therefore, companies decide to split their stock if the price of the stock rises appreciably and is perceived to be too expensive for small investors to afford. For example, if a company's shares are worth ` 1,000 each, an investor will need to spend ` 100,000 in order to own 100 shares. On the other hand, if each share is worth ` 10, an investor would need to pay only ` 1,000 to own 100 shares.

Effects of Stock Split

Stock splits are similar to bonus issues in the sense that each shareholder ends up with more shares but no change in his percent ownership of the company. The stock remains where it was. Each share represents half of the equity in the company than it did before the split. This means that each share is entitled to half the dividend, half the earnings, and half of the assets than it once was. P/E, dividend yield and market value, all remain unchanged. Thus, the wealth of the shareholder remains unchanged by stock split. Further, stock split increases the number of outstanding shares creating a condition where more of the company's stock is bought and sold (this is called "increased liquidity") and there is always a risk that the increased activity might lead to bigger gains and drops in the stock, making it more volatile, which is not a good thing.

Reverse Stock Split

A reverse stock split leads to the reduction in the number of a company's shares outstanding, but the market value of the shares (market capitalization) remains the same. It reduces the number of shares and increases the share price proportionately. A reverse stock split has no effect on the value of what shareholders own. For example, if you own 10,000 shares of a company and it declares a one for ten reverse split, you will own a total of 1,000 shares after the split.

There is a stigma attached to doing a reverse stock split, so it is usually initiated with a very good reason. It's generally a bad sign if a company is forced to reverse split - firms do it to make their stock look more valuable when, in fact, nothing has changed. Companies often split their stock when they feel the price of their stock is too low to attract investors to buy their stock. Many institutional investors and mutual funds have rules against purchasing a stock whose price is below some minimum, so companies

may resort to reverse stock split to avoid being in the so called 'black list' of these investors. In an extreme case, a company whose share price has dropped so low that it is in danger of being delisted from its stock exchange, might use a reverse stock split to increase its share price. It is also possible that a company uses reverse stock split as a tactic to reduce the number of shareholders.

Share Repurchase

Sometimes companies may find that some or all of their retained earnings cannot be invested to produce adequate returns. Share repurchase is one of the possible uses of retained profits that have not been deployed in any project. When a company repurchases its own shares, it reduces the number of shares held by the public, leading to an increase in earnings per share and elevating the market value of the remaining shares. Thus, stock repurchase or share buyback is the reacquisition of its own stock by a company by distributing cash to its existing shareholders. The company either retires the repurchased shares or keeps them as treasury stock, available for re-issuance.

Share repurchases also allow companies to distribute their earnings to their shareholders without inflicting them with double taxation, depending on the income tax laws of the country the firm is operating in. In many cases, companies buy back shares either to increase the value of shares still available or to eliminate any threats by shareholders who may be looking for a controlling stake. A buyback allows a company to invest in itself. By reducing the number of shares outstanding in the market, buybacks increase the proportion of shares a company owns.

Unlike bonus issue and stock split, share buyback uses company's cash. Hence, it can be viewed as an alternative to cash dividend. Some companies have a policy of buying back a small number of shares every year. This is an alternative to increasing the dividend. The main advantage of such an approach is that the company does not commit to sustain any payment as an increase in the dividends would require and, further, turns the return into a capital gain rather than income. Another advantage of a share buy-back is that it gives shareholders more flexibility than a dividend, as it allows them to choose if, and when, to sell their shares and realise their cash.

14.10 Dividend Policy in Practice in India

Various studies conducted to analyse the dividend behaviour of Corporate India and its impact on the market value of any firm have revealed that there is a positive correlation between a firm's long-term dividend payout ratio and its long-term sustainable earnings. Further, it has also been found that many firms have a long-term dividend payout ratio and this ratio affects the market value of the firm. There is significant evidence that the Indian investors are not indifferent between receiving dividends and capital gains. It is an accepted fact that dividends provide signaling mechanism for the future prospects of the firm and investors appreciate them. The signaling theory based on the asymmetric information implies that steady dividends reveal vital information about a firm's performance that is not conveyed by the financial reports and other disclosures. It has been found that Indian firms do consider the investors' preference for dividends and shareholder profile while designing the dividend policy. In India, most dividend paying firms have target dividend payout ratio and dividend changes with shift in the long-term sustainable earnings. The dividend policy is static to the extent that firms favour a stable dividend policy and dynamic to the extent that firms increase dividends with the increase in earnings to please their shareholders. We can safely conclude that most firms determine their dividends in accordance with the level of current earnings as well as the past dividend and that firms believe that investors prefer stable dividend policies. It is also seen that retained earnings are the most preferred source of finance by most Indian firms

followed by debt and then equity. This makes dividend distribution decision even more important. In all studies, there are clear indications that firms consider dividend policy to be a strategic decision and practice to a great extent what is taught in the business schools.

There are quite a few companies in India that are confident of their future cash flow and profitability and they do not hesitate to share their earnings with their shareholders in the form of dividends. There are approximately 400 companies in India that have paid some dividend for last 10 years or so. Among these companies there are those that have steadily increased the dividend payout over the years including multinational companies such as Nestle India, Hindustan Lever, Pfizer, GlaxoSmithKline Consumer and Cummins India to name a few. Many Indian companies also have a good track record of paying stable dividends including Ranbaxy Labs, Hero Honda Motors, Asian Paints, and a number of banking and non-banking finance companies. But there are also many companies that have retained their profits and not declared any dividends. These include e-Serve, Cranes Software, Sesa Goa, Tata Motors, Moser Baer, ABB, MICO, Havells India, Amtek India etc. It would be interesting to take a look at dividend declaration by various companies in the year 2010.

Companies Declared Dividend on 17 May, 2010

- Rajshree Sugars & Chemicals Ltd has informed BSE that the Board of Directors of the Company at its meeting held on May 17, 2010, recommend a dividend of ` 3/- per share for the year 2009-10.
- Poly Medicure Ltd has informed BSE that the Board of Directors of the Company at its meeting held on May 17, 2010, have recommended a dividend @` 2.50 per equity share of ` 10 each.
- International Conveyors Ltd has informed BSE that the Board of Directors of the Company at its meeting held on May 17, 2010, inter alia, have recommended a final dividend of` 0.15 per equity shares (i.e. 15%) in addition to the Interim Dividend of ` 0.10 per equity share (i.e. 10%).
- APW President Systems Ltd has informed BSE that the Board of Directors of the Company at its meeting held on May 17, 2010, inter alia, has recommended a dividend @ 20% on Equity Shares (i.e. ` 2/- per share), subject to approval of members in the Annual General Meeting.
- Provogue (India) Ltd has informed BSE that a meeting of the Board of Directors of the Company will be held on May 25, 2010, inter alia, to consider the following: 1. The Audited financial results of the company for the year ended March 31, 2010. 2. To consider recommendation of dividend to the shareholders for the year ended March 31, 2010.
- Reliance Communications Ltd has informed BSE that the Board of Directors of the Company at its meeting held on May 15, 2010, inter alia, has recommended a dividend of Re. 0.85 per equity share of` 5 each i.e. 17% for the financial year ended March 31, 2010.
- Hi-Tech Gears Ltd has informed BSE that the Board of Directors of the Company at its meeting held on May 15, 2010, inter alia, has recommended that a dividend of 45% of the paid share capital i.e. ` 4.50 per share.
- Kavveri Telecom Products Ltd has informed BSE that the Board of Directors of the Company at its meeting held on May 15, 2010, inter alia, has recommended a final dividend of` 2/- share.
- Spice Mobiles Ltd has informed BSE that the Board of Directors of the Company at its meeting held on May 15, 2010, inter alia, has recommended a dividend of 50% (` 1.50) per equity share

of ` 3/- each for the financial year ended March 31, 2010.

- Premier Explosives Ltd has informed BSE that the Board of Directors of the Company at its meeting held on May 15, 2010, inter alia, has recommended a dividend @ ` 2.00 per share for the year ended March 31, 2010 on the amount paid up, subject to approval of shareholders.
- Jammu & Kashmir Bank Ltd has informed BSE that the Board of Directors of the Bank at its meeting held on May 15, 2010, inter alia, have recommended 220% Dividend (i.e. Twenty Two Rupees per share) to shareholders for the year 2009-2010.
- FM Foods Ltd has informed BSE that the Board of Directors of the Company at its meeting held on May 15, 2010, inter alia, has recommended the payment of dividend @ 15% on 99,71,676 equity shares of ` 10/- each for the year 2009/10.
- Surana Industries Ltd has informed BSE that the Board of Directors of the Company at its meeting held on May 15, 2010, inter alia, has recommended dividend of 15%.
- Man Infraconstruction Ltd has informed BSE that a meeting of the Board of Directors of the Company will be held on May 25, 2010, inter alia, to consider the following : 1. To approve and take on record the audited financial results of the Company for the year ended March 31, 2010; and 2. To recommend dividend, if any.
- Kalyani Forge Ltd has informed BSE that a meeting of the Board of Directors of the Company will be held on May 26, 2010, inter alia, to consider and take on record Financial Results for the quarter and year ending on March 31, 2010 and to recommend dividend if any.
- Kabra Extrusiontechnik Ltd has informed BSE that a meeting of the Board of Directors of the Company will be held on May 26, 2010, inter alia, to transact the following business: 1. To consider and approve the Audited Balance Sheet as at March 31, 2010 and Profit & Loss Account for the year ended on that date. 2. To consider recommendation of Dividend, if any, in respect of the Financial year 2009-2010. 3. To approve Audited Financial Results for the year ended March 31, 2010. 4. To consider and approve other corporate reports forming part of the forthcoming Annual Report- 2009-10.
- Plastiblends India Ltd has informed BSE that a meeting of the Board of Directors of the Company will be held on May 26, 2010, inter alia, to transact the following business: 1. To consider and approve the Audited Balance Sheet as at March 31, 2010 and Profit & Loss Account for the year ended on that date. 2. To consider recommendation of Dividend/ if any, in respect of the Financial year 2009-2010. 3. To approve Audited Financial Results for the year ended March 31, 2010. 4. To consider and approve other corporate reports forming part of the forthcoming Annual Report- 2009-10.
- Jyothy Laboratories Ltd has informed BSE that a meeting of the Board of Directors of the Company will be held on May 25, 2010, inter alia, to consider the following : 1. Results of the Company for the Financial Year ended March 31, 2010 & 2. Declaration of dividend, if any, for the said Financial Year.
- Trent Ltd has informed BSE that a meeting of the Board of Directors of the Company will be held on May 28, 2010, inter-alia to approve the Audited Financial Results and recommendation of Dividend on the Equity Shares any, for the year ended March 31, 2010.

- Coastal Roadways Ltd has informed BSE that a meeting of the Board of Directors of the Company will be held on May 27, 2010, to consider and take on record the Audited Financial Results of the Company for the year ended March 31, 2010 and recommend Dividend, if any.
- Lakshmi Mills Company Ltd has informed BSE that a meeting of the Board of Directors of the Company will be held on May 26, 2010, inter alia, to consider and take on record the Audited Results for the year ended March 31, 2010 and declaration of dividend, if any.
- TVS Srichakra Ltd has informed BSE that a meeting of the Board of Directors of the Company will be held on May 28, 2010, to 1. consider the declaration of final dividend 2. consider and take on record the audited financial results for the year ended March 31, 2010.
- Vinyl Chemicals (India) Ltd has informed BSE that a meeting of the Board of Directors of the Company will be held on May 25, 2010, interalia, to consider the Audited Financial Results for the year ended March 31, 2010 and for considering whether dividend on equity shares of the company be recommended and if so, the amount thereof.
- Mundra Port and Special Economic Zone Ltd has informed BSE that the Board of Directors of the Company at its meeting held on May 17, 2010, inter alia, has recommended Final Dividend of Re. 1.50/- on Equity Shares of ` 10/- each subject to Shareholders approval in Annual General Meeting.
- Hind Rectifiers Ltd has informed BSE that a meeting of the Board of Directors of the Company will be held on May 28, 2010 inter alia, to consider the following Agenda: 1. To approve and take on record the Audited Financial Results of the Company for the year ended March 31, 2010. 2. To recommend Dividend subject to the approval of Shareholders for the year ended March 31, 2010. 3. To finalize the date of Book closure and Annual General Meeting. 4. To discuss the General Working of the Company.
- Larsen & Toubro Ltd has informed BSE that the Board of Directors of the Company at its meeting held on May 17, 2010, inter alia, have recommended a Dividend of ` 12.50/- per share (previous year ` 10.50/- per share).

Source: BSE India

The management of corporate India believes that dividend decisions are important as they provide a signaling mechanism for the future prospects of the firm and thus affect its market value. In India, firms take the investors' preference for dividends and the shareholder profile into consideration while designing the dividend policy. Most firms have a target dividend payout ratio but they also want to sustain stable dividends with growth over a period of time as the earnings permit. Therefore, dividend policy does matter to the CFOs and the investors and most companies try to maintain an uninterrupted record of dividend payments and avoid abrupt changes in their dividend policies.

14.11 Summary

Dividend policy is one of the modern firms' major financial decisions. The dividend policy of a company is one of the most prominent decisions that the board of directors of a company makes. It affects the form and the amount of dividends that the existing shareholders of the company receive. Appropriate dividend policy can not only result in a good corporate image, but also augment the confidence of investors in the company's future prospects which in turn creates a good corporate financing

environment and ensures the company's long-term growth and expansion. Dividend policy has three main aspects:

(1) How much dividend to pay i.e. the dividend payout ratio which determines the actual distribution of earnings per share

(2) The pattern of payment i.e. the dividend policy which could be a stable or residual or fixed dividend policy

(3) The form of dividend payment i.e whether the common dividend is to be paid in the form of cash stock or any mode permissible by the law.

Though the directors of the company have a right to determine its dividend policy, they have to take into consideration the legal and contractual framework while deciding the dividend to be paid. Further, there are a host of internal and external factors that influence the dividend policy of a company.

· When such companies are conistently paying and growing dividends, they are (1) ensuring that shareholders are an important part of their business; (2) shows management's ability to be financially responsible; and (3) confidence that their business strategies will continue to generate earnings. Since most of the companies pay dividends from free cash flow, the likelihood of engineering the balance sheet is very low.

14.12 Key Words

- **Divided** : Refers to the corporate net profits distributed as current income to the existing shareholders. The dividend is often referred to in terms of the rupee amount each share receives and this amount is called DPS or dividends per share
- **Retained Earnings:** That portion of net profits which is not distributed as dividends and is held by the Company to finance its investment opportunities.
- **Divided Payout Ratio:** It is the percentage of earnings paid by way of dividend.
- **Retention Ratio:** It is the percentage of earnings retained by the firm, not distributed as dividend.
- **Bonus Share:** When a company pays a bonus to its shareholders in the form of shares; the free share thus issued is known as a bonus share. It is a form of dividend.
- **Final Dividend:** The final dividend is the dividend paid after the finalization of the accounts of the company.
- **Interim Dividend:** Payment of dividend in between the two Annual General Meetings before finalizing the accounts is called Interim Dividend. It is paid in cash.
- **Cash Dividend:** This is the most basic form of dividend that is paid through cheque or electronic transfer.
- **Stock Dividend:** Stock dividend is given in the form of bonus shares or stocks of the issuing company.
- **Bond Dividend:** Dividend given in the form of debentures or bonds or notes for a long-term period is called bond dividend.
- **Declaration Date:** The declaration date is defined as the date on which the board of directors of

the company declare their intention to pay dividend.

- **Record Date:** The record date is defined as the date on or before which the shareholders who have officially recorded their ownership are entitled to get the dividend.
- **Market Capitalization:** It is the total rupee value of a company's outstanding shares and is calculated by multiplying its outstanding shares by its current market price per share (MPS).

14.13 Self Assessment Test

1 What is dividend? Discuss various forms of dividend.

2 Which law/act regulates the distribution of dividend in India? Summarize its main provisions.

3 Mention all the important dates in dividend payment chronology.

4 Write an analytical note on various factors affecting dividend policy.

5 Discuss in detail the theories of dividend policy with their advantages and disadvantages.

6 What are the main measures of dividend?

7 The PAT of company is ` 500 lakhs, dividend is ` 250 lakhs and the market price of its stock is 8000. Calculate its Dividend Payout ratio and Dividend Yield.

8 Write a comparative note on Bonus Issue, Stock Split, Reverse Stock Split and Share Repur chase.

9 Are dividends relevant to Indian firms? Discuss.

UNIT - 15 : DIVIDEND MODELS

Unit Structure

15.0 Objectives

After studying this unit, you should be able to understand:

- The concept of relevance or irrelevance of dividends
- MM Hypothesis on dividend
- Graham Dodd Mode
- Walter's Dividend Model
- Dividend Discount Model
- Gordon's Dividend Capitalization Model
- Lintner's Model

15.1 Introduction

Dividend policy is one of the most important financial policies, not only from the viewpoint of the company, but also from that of all other stakeholders including the shareholders, the customers, the workers, regulatory bodies and the Government. It is also is one of the most controversial subject in finance. Finance scholars have engaged in extensive theorizing to explain whether or not the companies should pay dividends. Various studies including those conducted by Lintner (1956), Brittain (1964), Modigliani and Miller (1961), Pettit (1972), Black and Scholes (1973), Michael and Thaler and Womack (1995) have shown that in the developed countries, the decision between paying dividend and retaining earnings is taken seriously by both shareholders and management. 'To pay or not to pay dividends' is a subject that has been considerably researched by economists in the last few decades. Leading financial theorists have argued over whether dividends and dividend policy of a firm matters to its shareholders and various schools of thought on the importance/relevance or irrelevance of dividends to the shareholders have emerged. These are as follows:

15.1.1 Dividend Irrelevance Theory

This theory suggests that dividends have no impact on the value of a share. Therefore, investors are indifferent to receiving dividend or enjoying capital gains. This view is based on following two major assumptions:

- There are no tax disadvantages associated with receiving dividends vis-à-vis capital gains.
- Firms do not incur any issuance costs in raising external capital for new investments.

15.2.1 Tax Preference Theory

According to this view, dividends destroy value for shareholders because they are usually taxed at a higher rate than capital gains. This theory says that dividends do matter but in negative sense i.e. high dividend payout ratio reduces the capital gains that shareholders prefer and would get in the event of a low payout.

15.2.2 Bird in Hand Theory

The proponents of this theory believe that dividends are relevant and matter in positive sense. According to this view, dividends can be value increasing for many firms, especially those that have stockholders who prefer current income to capital gains. Moreover, a healthy dividend payout ratio sends out positive signals about the financial health of the company and enhances its goodwill and credit worthiness that in turn makes it easier for the company to raise finance from external source.

15.2.3 Dividend Signaling Theory

This theory suggests that company announcements of an increase in dividend payouts act as an indicator of the firm possessing strong future prospects. Managers have greater access to inside information about the company. They may share this information with the shareholders through an appropriate dividend policy i.e. send out signals regarding the health of the company through dividend payout. Constant or increasing dividends convey positive signals about the future prospects of the company resulting in an increase in share price. Similarly, absence of dividends or decreasing dividends convey negative signal resulting in decline in share price. If a company cuts its dividends, stockholders may become worried that the company is not generating enough earnings to satisfy its internal needs for cash as well as pay out its current dividend, leading to a plunge in share prices.

15.2.4 Clientele Effect

Depending on their personal tax situation, some stockholders may prefer capital gains over dividends and vice versa as capital gains and dividends are usually taxed at a different rate. The clientele effect is simply different stockholders' preference on receiving dividends compared to capital gains. A company's change in dividend policy may produce changes in the "clientele" interested in owning its stock, leading to a change in its share price. The clientele effect assumes that investors are attracted to different company policies, and that when a company's policy changes, investors will adjust their stock holdings accordingly. As a result of this adjustment, the stock price will move.

According to this theory, a company's stock price will move as per the demands and goals of investors in reaction to a tax, dividend or other policy change affecting the company.

The main implications of Clientele effect are:

- Different groups of investors, or clienteles, prefer different dividend policies, e.g. retirees need dividends for income.
- A firm's past dividend policy determines its current clientele of investors.
- Clientele effects impede changing policy. Taxes and brokerage costs hurt investors who switch companies.

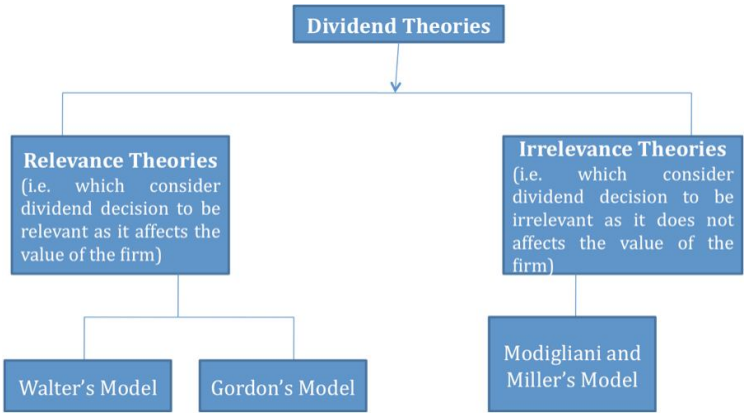
15.2.5 Agency Theory

Agency theory is another view of dividend relevance, advanced by Jensen and Meckling (1976), and extended by Rozeff (1982) and Easterbrook (1984). This theory originates from the conflict of

interests between corporate managers (agents) and outside shareholders (principals). For example, management can consume excessive perquisites out of undistributed corporate earnings and invest the retained funds sub optimally. This conflict leads to agency costs. Agency theory claims that the dividends provide an incentive for the managers to reduce the costs related to the principal/agent relationship. One way to reduce agency costs is to increase dividends. Paying larger dividends reduces the internal cash flow subject to management discretion and forces the firm to seek more external financing. To raise costly outside capital, the firm needs to prepare itself for a scrutiny by the capital market for new funds. This reduces the possibility of suboptimal investment. Such monitoring by outside investors of capital also helps to ensure that managers act in the best interest of the shareholders. Thus, dividend payments may serve as a means of monitoring management performance.

So, as per the agency theory of dividend that claims that the payment of dividends is one of the measures available to managers for controlling agency behaviour, the optimum level of dividend payout is that which minimizes the agency cost structure relative to the cost of raising new funds. A liberal dividend policy may lead to enhancement of the shareholder value by reducing the agency costs.

The financial literature has many models supporting both the theory of irrelevance of dividends as well as the theory of relevance of dividends. The main model supporting view of irrelevance of dividends is the ***Miller and Modigliani Model (MM Hypothesis)*** whereas traditionalists such as ***Myron Gordon, John Lintner and Benjamin Graham*** have put forth models arguing that dividends are relevant. In this unit, we shall discuss various models of dividend put forth by leading financial theorists including ***MM Hypothesis,*** **Graham & Dodd Model**, **Linter's Model, Gordon's Model and Walter's Model.**



15.2 MM Hypothesis

Much like their work on the capital structure irrelevance proposition, Modigliani and Miller also theorized that, with no taxes or transaction costs, dividend policy is also irrelevant. This is known as the "dividend-irrelevance theory", indicative of the fact that there is no effect of dividends on a company's capital structure or stock price. It is the most comprehensive argument in support of dividend irrelevance. MM model is also known as Dividend Irrelevance Model. Modigliani and Miller maintain that dividend policy (has no effect on the share price of the firm and is, therefore, of no significance. They put forward the hypothesis that dividend is a passive variable and it does not influence the share valuation. Thus, the dividend payout ratio is a mere detail and it has no effect whatsoever on the wealth of the shareholders. They contend that the value of the firm is determined solely by its earning power and not the pattern of distribution of earnings. According to them, the investment policy of the firm is more important because through it the firm can increase its earnings and thereby its value. Given the investment decision, the dividend decision that splits the earnings into retention part and distribution part does not matter much in the scheme of things. The core of the argument supporting the irrelevance of dividends to valuation of a

firm is that (the dividend policy of the firm is a part of its financing decision and the dividends are nothing but passive residue paid out of excess cash. It implies that if a firm has attractive investment opportunities, it will retain the earnings to finance them and if acceptable investment projects are inadequate, the earnings will be distributed to the shareholders. Investment opportunities are judged to be attractive on the basis of the relationship between the return on investment (r) and the cost of capital (k). If $r > k$, retained earnings are preferred and if $r < k$, dividend payout is preferred by the firm.

That dividend is irrelevant, or is a passive residue, is based on the assumption that the(shareholders are indifferent between dividends and capital gains. So long as the firm earns more than the equity capitalization rate (k), the shareholders are content with the firm retaining its earnings. Conversely, if the return is less than k, shareholders would prefer dividends over retention. The crux of the MM position on the irrelevance of dividend is the arbitrage argument that is discussed after the assumptions of this approach.

Miller and Modigliani Model assume that the dividends are irrelevant. Dividend irrelevance implies that the value of a firm is unaffected by the distribution of dividends and is determined solely by the earning power and risk of its assets. Under conditions of perfect capital markets, rational investors, absence of tax discrimination between dividend income and capital appreciation, given the firm's investment policy, its dividend policy may have no influence on the market price of the shares, according to this model.

Mathematical expression of MM Model

The MM Approach mathematically proves that the dividend policy of a firm is irrelevant to its valuation by deriving an equation that shows that the value of a firm is independent of the dividends paid out by it. Symbolically, the model is given as:

Step I: The market price of a share in the beginning is equal to the PV of dividends paid at the end of the year and market price at the end of the period. This may be expressed as:

$P_0 = (D_1 + P_1) / (1+k)$

Where

P_0 = current market price

P_1 = market price at the end of the year

D_1 = dividends to be paid at the end of the year

k = the cost of equity capital

Step II: Assuming there is no external financing, the value of the firm (V) will be equal to the number of outstanding shares (n) multiplied by the price of each share (P_0). Symbolically:

$$V = nP_0 = n(D_1 + P_1) / (1+k)$$

Step III: If the firm's internal sources of financing its investment projects fall short of funds required, new shares, say m number of shares, are issued at the end of year 1 at price P_1. In this case, the value of firm at time 0 will be:

$$V = nP_0 = nD_1 + (n-m)P_1 - m P_1 / (1+k)$$

Thus, the value of the firm 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 projects 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:

$mP_1 = I_1 – (X_1 - nD_1)$

$= I_1 – X_1 + nD_1$

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

Step IV: Substituting the value of mP_1 in

$V = nP_0 = nD_1 + (n-m)P_1 - m P_1 / (1+k)$

We get,

$V = nP_0 = (n + m)P_1 - I_1 + X_1 / (1+k)$

On comparison of the above two equations, we find that there is no difference between the two valuation equations although second equation 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. Hence dividends are irrelevant.

Example: ABC Ltd. has a capitalisation rate is 10%. It currently has 1,00,000 shares selling at ` 100 each. The firm is contemplating declaration of a dividend of ` 6 per share at the end of the current year.

Answer the following questions based on Modigliani and Miller Model:

(i) What will be the price of the shares at the end of the year if a dividend is not declared?

(ii) What will be the price if dividend is declared?

(iii) Assuming that the firm pays dividend, has a net income of ` 10 lakh and new investments of ` 20 lakhs during the period, how many new shares must be issued?

Solution:

Using

$P_0 = (D_1 + P_1) / (1+k)$

Where,

D_1 = Contemplated dividend per share i.e., ` 6

P_1 = Market price of share at the year end (to be determined)

Po = Existing market price of share i.e., ` 100

k = Cost of equity capital or rate of capitalization i.e., 10% or 0.10

(i) If dividend is declared

$P_0 = (D_1 + P_1) / (1+k)$

$100 = (6 + P_1) / (1+.10)$

or,

$P_1 + 6 = 110$

or,

$P_1 =$ ` 104

(ii) If dividend is not declared

$P_0 = (D_1 + P_1) / (1+k)$

$100 = (0 + P_1) / (1+.10)$

or,

$P_1 = 100 \times 1.10 =$ ` 110

(iii) Calculation of No. of Shares to be issued (m)

$$m = (I_1 – X_1 + nD_1) / P_1$$

Where,

n =Number of Shares outstanding at the beginning of the period i. *e.* , 1,00,000 shares

m = number of new shares issued

I_1 = Total investment required for i.*e.* ` 20,00,000 $X_1$ = Earning of the firm during the period after payment of dividend, ` 10,00,000

(i) If dividend is declared :

m = (20,00,000 - 10,00,000 + 6,00,000) / 104

= 15385 shares

Total market value of shares at the end of the year:

= Total no.of outstanding shares x P_1

= (100000 + 15385) x 104

= ` 120 lakhs

(ii) If dividend is not declared :

m = (20,00,000 - 10,00,000 + 0) / 110

= 9091 shares

Total market value of shares at the end of the year:

= Total no.of outstanding shares x P_1

= (100000 + 9091) x 110

= ` 120 lakhs

Therefore, whether dividends are paid or not, value of the firm remains the same as per M.M. approach

Assumptions Of MM Hypothesis

MM Hypothesis is based on certain basic assumptions that are as follows:

- Existence of perfect capital markets where all investors are rational is one of the main assumptions of this hypothesis. Perfect capital markets imply that information is available to all free of cost, securities are perfectly divisible and no investor is large enough to influence the market price of securities.
- There are no transaction costs i.e. securities can be bought and sold without paying any brokerage or other expenses.
- There are no floatation costs which means firms can raise capital without incurring any costs like advertisement, brokerage etc.
- There are no taxes or there is no difference in tax rates applicable to dividends and capital gains.
- The investment policy of the firm is fixed. This means the financing of investment projects through retained earnings does not change the business risk and required rate of return.
- There is perfect certainty about the future expectations of investments and profits of the firm. This enables the investors to predict future prices and dividends with certainty. (This assumption was later dropped by MM).

Basic tenets of MM Model

- MM Model asserts the irrelevance of dividends on the basis of the arbitrage process. Arbitrage implies the distribution of earnings to shareholders in the form of dividend and raising an equal amount externally to fund the investment projects of the firm. The effect of dividend payment would be offset by the effect of raising additional funds.
- MM model argues that when a firm pays dividend, it will have to resort to external sources of finance for investment projects. So new shares will be issued leading to an increase in the total number of shares and thereby, to a decline in the share prices. Thus, the shareholders, on the one hand, gain by receiving dividend, and on the other hand, lose by way of decrease in the value of shares.
- MM premise is equally valid even if external funds are(raised in the form of debt instead of equity capital. This is because of their(indifference between debt and equity with respect to leverage. According to this model, the cost of capital is independent of leverage and the real cost of debt is the same as the real cost of equity. So the investors are also indifferent to whether the external funds are raised by debt or equity. Further, with dividends being irrelevant, a firm's cost of capital is independent of its dividend-payout ratio. The cost of capital is independent of leverage and the real cost of debt is the same as the real cost of equity
- Arbitrage process will ensure that even under the conditions of uncertainty, the dividend policy would be irrelevant.
- This theory assumes that investors can affect their return on their stock regardless of the dividend policy. This means investors are not affected by a company's dividend policy while buying shares since they can simulate their own dividend policy.

The Arbitrage Process

The Arbitrage Process is the process of entering simultaneously into two transactions that exactly balance or offset each other. In this instance, the two transactions are payment of dividend and raising finance for capital investment from external sources by issuing new shares or borrowing. If a firm decides to invest in a capital project, it has two alternatives:

- Retain earnings and use them for investment thereby not paying any dividend or
- distribute dividend and raise exactly the same amount by issue of new shares or debentures.

The arbitrage process becomes necessary when the firm decides to pay dividend. Here arbitrage implies the distribution of earnings to shareholders and raising an equal amount externally; the effect of dividend distribution will be offset by the effect of raising additional funds.

So the investors, according to Modigliani and Miller, would be indifferent between dividend and retention of earnings. The investors would not care whether the firms pays dividend or retain the profit. Irrelevance of dividend argument will also hold well no matter how external finance is raised i.e. through issue of new shares or by the issue of debentures.

Homemade Dividend

Homemade dividend is a form of investment income that comes from the sale of a portion of shares held by a shareholder and it is different from dividend that shareholders receive in proportion to the number of shares they hold. The existence of homemade dividends supports the dividend irrelevance theory. If investors desire income they can either sell their shares when they want that income or they can invest in other income-generating assets. The concept of ***homemade dividend*** further embellishes the MM's theory. If a shareholder really wants income, he or she can construct his or her own dividend policy by selling sufficient shares to create their own dividend.

Criticism of MM Approach

The MM approach has been found to be impractical and unrealistic because of its absurd and theoretical assumptions that do not hold well in the real world. It is criticized on following grounds:

- **Imperfection of Capital Markets**: MM approach argued that the Capital Markets are perfect, i.e. there are no transaction cost, floatation cost, taxes and other restrictions. We all know that in reality this is not true.
- **Resolution of Uncertainty**: There is always uncertainty about the future and this uncertainty affects the Dividend Policy of a Firm. Shareholders cannot be indifferent between dividend and retained earnings under the conditions of uncertainty because of following reasons:

(i) desire for current income,

(ii) informational content of dividends,

(iii) near vs distant dividends,

(iv) sale of stock at uncertain price.

(v) transaction and inconvenience costs,

(vi) under pricing of new shares.

Due to market imperfections, the investors are not indifferent between dividends and retained earnings. Floatation costs seem to favour retention of earnings because raising finance from external sources would entail additional expense. On the other hand, the desire for current income and, the related transaction costs, legal restrictions and tax exemption of dividend income imply a preference for dividends. A shareholder selling shares to create homemade dividend would incur transaction costs and, in some countries, capital gains tax. Furthermore, selling shares on a periodic basis to create a stream of homemade dividends could be problematic when equities are volatile. Shareholders will naturally be reluctant to create such dividend when share prices are low. In sum, market imperfections make the dividend policy quite relevant. Thus, most assumptions of MM hypothesis are untenable.

15.3 Graham Dodd Model

B. Graham and D. L. Dodd gave this approach. Through their model, they clearly emphasized the relationship between the dividends and the stock market. The model shows that stock market responds positively to higher dividends and negatively to low dividends. Dividend policy of a company is very crucial in order to maintain good relations with the shareholders of the company. Once a company decides to pay dividends, it needs to establish a permanent dividend policy, which may impact investors' and analysts' perception of the company in the financial markets. Generally the shareholders, given the liquidity preference theory, respect companies paying dividends. If a company thinks that it has enough investment opportunities and it would be able to substantially increase the value of the company for the shareholders, then it should retain the profits at the cost of paying dividends. What a company decides to do with its earnings depends on the situation of the company now and in the future. It also depends on the preferences of existing shareholders and potential investors.

Mathematical Expression of Graham and Dodd Model

Graham and Dodd established the relationship between the market price and dividends and gave the following formula:

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

Where,

P = Price

m = multiplier

D = Dividend per share

E = Earnings per share

Assumptions of Graham and Dodd Model

- Investors are rational.
- The investors turn risk averse under the conditions of uncertainty

Implications Graham and Dodd Model

The weight attached to dividends is equal to four times the weight attached to retained earnings, showing that dividends are more significant.

Criticism of Graham and Dodd Model

The weights provided are based on subjective judgement and not derived from any empirical analysis.

15.4 Walter's Dividend Model

Over the years, various models have been developed to establish the relationship between dividends and stock prices. The most important of them is Walter Model. Prof James E. Walter devised a simple formula to show how dividend can be used to maximize the wealth position of shareholders. According to him, in the long run, share prices reflect the present value of the future stream of dividends He considers dividend as one of the most important factors determining the market valuation. Retained earnings influence stock prices only through their effect on further dividends. Walter's model supports the principle that dividends are relevant. The investment policy of a firm cannot be separated from its dividend policy and both are inter-related. The choice of an appropriate dividend policy affects the value of an enterprise.

Mathematical expression of Walter's Model

The formula used by Walter to determine the market price per share is:

$$P = \{D + (r/k) (E-D)\} / k$$

Where,

P = Market price per share

D = Dividend per share

E = Earnings per share

r = Internal rate of return (Actual capitalization rate)

k = Cost of capital (External capitalization rate)

Walter's formula has the same effect as the continuing dividend growth formula. It measures the effect of dividends on the value of a share by comparing actual and normal capitalization rates. It also provides an added or reduced weight to the retained earnings (E–D) 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.

Example: The EPS of a company is ` 8 and the rate of capitalization (k) applicable is 10%, dividend payout ratio is 50%, and returns (r) on its retained earnings is 15%.Compute the market price of the company's shares as per Walter's model.

Solution:

(i) Market price per share when r = 15% and dividend payout ratio is 50%

Dividend paid = $8 \times 50/100$ = ` 4

$P = \{4 + (.15/.10) (8-4)\} / .10$

= ` 100

Assumptions of Walter's Model

Walter's model is based on the following assumptions:

- The company is a going concern with perpetual life span i.e. it has a very long and indefinite life.
- The only source of finance is retained earnings i.e. the firm funds its investment projects exclusively by retained earnings. It does not resort to alternative means of financing like debt or new equity.
- The cost of capital (k) and return on investment (r) are constant throughout the life of the company. A firm's business risk does not change even with additional investment.
- All earnings of the firm are either distributed as dividend or retained and invested internally immediately.
- There is no change in the key variables, such as, earnings per share (E), and dividends per share (D). The values of D and E may be changed in the model to determine results, but any given value of E and D are assumed to be constant in determining a given value.

Basic tenets of Walter's Model

- Walter contends that the dividend is relevant and is, therefore, an active variable that affects the price of a company's shares and its value by leading to wealth maximization.
- Walter argues that the market price of a share is the sum of the present value of the following two cash streams:

a. Infinite stream of constant future dividends.

b. Infinite stream of capital gains (retained earnings)

- The optimum dividend is determined by the relationship of internal rate of return (r), which is the return on firm's investment, and the cost of capital (k) that is, the rate at which funds are available to the firm from external sources.
- If the rate of return earned by firm in its business (r) is more than its cost of capital (k), the firm should retain the earnings, as it could be invested more profitably in business. On the other hand, if the cost of capital (k) is more than the return on firm's investment (r), the firm should distribute its earnings as dividend, as in that case, the shareholders receive dividend, on which they can earn a higher return by investing it elsewhere.
- Thus, Walter has related the dividend policy with investment opportunities available to the firm. If the firm has adequate profitable opportunities of earning higher return (r) than what the shareholders expect (k), it should retain its earnings for investing.
- The model considers internal rate of return (r), market capitalisation rate (k) and dividend payout ratio in determination of share prices.
- Walter model explains why market prices of shares of growth companies are high even if dividend payout is low. It also explains why the market prices of shares of certain companies that pay higher dividend and retain low profits are high.
- Firms earning higher returns are called ***Growth Firms***. For growth firm, the optimum dividend policy will be a ***zero dividend payout ratio***. It means that the firm can maximize owners' wealth by retaining its entire earnings. In growth firms internal rate of return is greater than the normal rate($r > k$). Therefore, r/k factor will greater than 1. Each rupee of retained earnings will have a higher weight in Water's formula than a comparable rupee of dividends.
- Firms that do not have profitable investment opportunities, that is, their rate of return is less than the cost of capital ($r < k$), are called ***Declining Firms***. For them, the optimum dividend policy would be to ***payout their entire earnings as dividend*** to shareholders to maximize the value of the firm. The management of such firms should distribute its earnings entirely to the stockholders so that they may either spend it or invest elsewhere to earn higher return. 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 its earnings at all.
- Firms where the rate of return is equal to cost of capital ($r = k$) are called ***Normal Firms***. For such firms, there is ***no optimal dividend policy*** Value of these firms is indifferent to whether the earnings are distributed as dividend or retained by the firm. They can distribute anything between zero percent to 100 per cent of earnings as dividend without affecting the value of the firm. For such firms, retained earnings will have the same weighted value as dividends.
- Effect of Dividend Policy on Value of Share

Case	If Dividend Payout Ratio Increases	If Dividend Payout Ratio Decreases
1. In case of Growing firm i.e. where $r > k$	Market Value of Share decreases	Market Value of a share increases
2. In case of Declining firm i.e. where $r < k$	Market Value of Share increases	Market Value of share decreases
3. In case of normal firm i.e. where $r = k$	No change in value of Share	No change in value of Share

Conclusions of Walter's Model

- When r > k, the value of shares is inversely related to the D/P ratio. As the D/P ratio increases, the market value of shares decline. Its value is the highest when D/P ratio is 0. So, if the firm retains its entire earnings, it will maximize the market value of the shares. The optimum payout ratio is zero.
- When r < k, the D/P ratio and the value of shares is positively correlated. As the D/P ratio increases, the market price of the shares also increases. The optimum payout ratio is 100%.
- When r = k, the market value of shares is constant irrespective of the D/P ratio. In this case, there is no optimum D/P ratio.

Limitations of this model

- Walter's model assumes that only retained earnings finance the firm's investments. This assumption limits the applicability of the model to all-equity firms.
- The assumption of r as constant is not realistic. In fact, a firm's internal rate of return does not always remain constant. It has been observed that it decreases as more and more investment in made.
- The assumption of a constant k does not take into account the effect of risk on the value of the firm. In practice, k changes directly with the firm's risk.
- It does not take external financing into consideration. Hence, it fails to appropriately calculate prices of companies that resort to external sources of finance.
- It ignores various other factors determining the share prices.

15.5 Dividend Discount Model

The Dividend Discount Model (or DDM, dividend valuation model,) is the simplest and the oldest present value approach to valuing a stock. It is based on the theory that a stock is worth the discounted sum of all of its future dividends. In other words, it is used to evaluate stocks based on the net present value of the future stream of dividends. This model is a basic tool for equity valuation and it prices a stock by the sum of its future cash flows discounted by the required rate of return that an investor needs to offset the risk of owning the stock. Future cash flows include dividends and price realized by selling the stock. The value of the stock calculated by DDM is called the intrinsic value of the stock. If the stock pays no dividend, then the expected future cash flow is equal to the present value of the market price of the stock when it is sold.

Intrinsic Value of stock = Sum of Present Value of future Dividends + Present Value of Stock Sale Price

To understand DDM better, let us consider

A) Single holding period

B) Multiple holding period

Single Holding Period

Single holding period implies that the investor holds the share for one year. In this holding period, he receives two cash flows: first is the dividend, and the second is the price he will realize by selling the stock. So the value of stock as of today will be:

$V_0 = D_1 / (1+r)^1 + P_1 / (1+r)^1 = D_1 + P_1 / (1+r)^1$

Where

V_0 = the value of the stock today, at t = 0

P_1 = the expected price per share, at t = 1

D_1 = the expected dividend per share for Year 1,

paid at t = 1

r = the required rate of return on the stock

This equation applies the principle that an asset's value is the present value of its future cash flows to a single holding period. In the above equation, it is assumed that the dividend is paid at the end of the year and that the stock is also sold at the end of the year. This assumption simplifies the discussion ast the capitalization rate (r) is an annual rate.

Example: Suppose that you expect ABC Ltd. to pay a ` 1.10 dividend next year. You expect the price of this company's share to be ` 53.55 in one year. The required rate of return for the stock is 9%. What is the estimate of the value of stock today?

Solution: Discounting dividend and share price at required rate of return, we get

$V_0 = D_1 + P_1 / (1+r)^1$

$= 1.10 + 53.55 / (1+0.09)$

$= 54.65/1.09$

= ` 50.14

Multiple Holding Period

Multiple holding period implies that the investor holds the share for more than one year. In this holding period, he receives following cash flows: the dividend for each year of holding the share, and the second is the price he will realize by selling the stock.

Let us find the value of stock as of today if the holding period is 2 years:

$V_0 = D_1 / (1+r)^1 + D_2 / (1+r)^2 + P_2 / (1+r)^2$

$= D_1 / (1+r)^1 + D_2 + P_2 / (1+r)^2$

Where

V_0 = the value of the stock today, at t = 0

P_2 = the expected price per share, at t = 2

D_1 = the expected dividend per share for Year 1,

paid at t = 1

D_2 = the expected dividend per share for Year 2,

paid at t = 2

r = the required rate of return on the stock

This equation applies the principle that an asset's value is the present value of its future cash flows to two year holding period. In the above equation, it is assumed that the dividend is paid at the end of the year and that the stock is sold at the end of the two years. This assumption simplifies the discussion as the capitalization rate (r) is an annual rate.

The value of a share of a company for any finite holding period can be calculated using DDM. In fact, the value of a share for any finite holding period is just a straightforward extension of the equations for one and two year holding periods.

For an n-period model i.e. t = n, the equation may be written as:

$$V_0 = D_1 / (1+r)^1 + \ldots\ldots + D_n / (1+r)^n + P_n / (1+r)^n$$

Using the summation notation, above equation may be rewritten as:

$$V_0 = \sum_{t=1}^{\mu} D_t / (1+r)^t + P_n / (1+r)^n$$

Example: Suppose that you expect ABC Ltd. to pay a ` 2.00, ` 2.10, ` 2.20, ` 3.50, and ` 3.75 dividend for the next 5 years. You expect the price of this company's share to be ` 40.00 in 5 years. The required rate of return for the stock is 10%. What is the estimate of the value of stock today?

Solution: Discounting dividend and share price at required rate of return, we get

$V_0 = 2.00/1.10 + 2.10/(1.10)^2 + 2.20/(1.10)^3 +$

$3.50/(1.10)^4 + 3.75 / (1.10)^5 + 40 / (1.10)^5$

$= 1.818 + 1.736 + 1.653 + 2.391 + 2.328 +$

24.837

= ` 34.76

Note that if the stock is never sold, then it is essentially a perpetuity, and its price is equal to the sum of the present value of its dividends. Since the DDM considers the value of the stock to be equal to its future cash flows, then for computing value of a share for infinite holding period i.e. share is not sold, we need to take the present value of all future expected dividends.

Hence, the value of share for indefinite holding period may be expressed as:

$$V_0 = D_1 / (1+r)^1 + \ldots\ldots + D_n / (1+r)^n + \ldots\ldots.$$

Using the summation notation, above equation may be rewritten as:

$$V_0 = \sum_{t=1}^{\mu} D_t / (1+r)^t$$

The above equation is the ***general form of the dividend discount model, first presented by John Burr Williams (1938)***. Even from the point of view of an investor holding the share for a finite period, the value of stock depends on all future dividends, directly on the dividends he expects to receive before stock is sold and indirectly on the expected dividends after the stock is sold, because those future dividends determine the expected selling price.

Forecasting the Future Stream of Dividends

Future dividends can be forecast by assigning the stream of future dividends to one of the several growth patterns. Based on growth pattern, following three models are used in the dividend discount model:

- Zero-growth, which assumes that all dividends paid by a stock remain the same;

- Constant-growth model, which assumes that dividends grow at a specific percentage forever (the Gordon growth model)
- variable-growth model, which assumes that dividends grow at a specific percentage for some time and then the growth rate changes. The growth rate has been further classified into a. the two-stage growth model b. the three-stage growth model, which typically divides growth into 3 phases: a fast initial phase, then a slower transition phase that ultimately ends with a lower rate that is sustainable over a long period.

Zero Growth Model

If a firm pays same dividend every year, the value of the share is calculated under the zero growth model. This model assumes no growth in dividend and value of share would equal the present value of perpetuity of dividends discounted at the required rate of return. Symbolically,

$$P = D_1 / k$$

Where,

P = Price of the share

D_1 = Constant dividend per share

k = required rate of return for investors

Example: A firm pays dividend of ` 10 constantly over an indefinite time horizon. Required rate of return for investors is 16%. Compute the value of the share.

Solution:

P = 10 / 0.16 = ` 62.5

Constant Growth Model

When dividends grow at a constant rate every year, the value of the share is determined through constant growth model. This model is also called Gordon Model. The value of the share is given by the following equation:

$$P = D_1 / k - g$$

Where,

P = Price/value of the share
k = Required return
g = Growth rate in dividend

Example: A firm pays dividends over six years at constant growth rate of 7%. Required rate of return is 16% and in the 7th year, the DPS is expected to be ` 3. Compute the value of the share.

Solution:

P = 3 / 0.16 – 0.07 = ` 33.3

If both the capitalization rate and dividend growth rate remain the same every year, then the denominator doesn't change, so the stock's intrinsic value will increase annually by the percentage of the dividend increase. In other words, both the stock price and the dividend amount will increase by the constant-growth factor, g.

Variable Growth Model

Most of the firms pay dividends over the years with some growth rate and after that the growth rate is changed. In such case, computation of the value of a share becomes more complex because we

need to take into account the changes in the dividend payment over the years. In this model, the share value is determined through following steps:

- Compute the present values of the expected cash dividends for the initial growth years and compute the sum total.
- Find out the value of the share at the end of year from which dividend growth is expected to change.
- Determine the present value of the value of the share computed as above.
- Add the values thus calculated

Example: A firm pays ` 3 dividend per share currently, which is expected to grow at 10% for the next three years after which growth rate will decrease to 5% forever. Assuming 15% required rate of return compute the value of the share.

Solution:

Step 1

Present value of dividends for first three years

Year end	DPS (growth 10% (Rs.)	PV(15%) $_{15\%,1to3}$	PV (Rs.)
1	3.3	0.87	2.87
2	3.63	0.756	2.75
3	4	0.0658	2.63
			8.25

Step 2

Dividend expected in year 4 after the growth of 5% = ` 4.2

Price at the end of year 3

$P_3 = 4.2 / 0.15 – 0.05 =$ ` 42

Step 3

Present Value = P_3 x PVIF 15%, 3

= 42 x 0.658

= ` 27.64

Step 4

Value of the share

= P = 8.25 + 27.64

= ` 35.89

Criticism of Dividend Discount Model

The dividend discount model is a useful heuristic model that relates the present stock price to the present value of its future cash flows. The problem with this model is that it depends on projections about company growth rate and future capitalization rates of the remaining cash flows. Getting either the capitalization rate or the growth rate wrong will yield an incorrect intrinsic value for the stock, especially since

even small changes in either of these factors can greatly affect the calculated intrinsic value. Furthermore, the longer the period under consideration, the greater the chances of both factors being incorrect. Hence, the true intrinsic value of a stock is unknowable, and, thus, it cannot be determined whether a stock is undervalued or overvalued based on a calculated intrinsic value, since different investors will have a different opinion about the company's future. In truth, the dividend discount model requires an enormous amount of speculation to forecast future dividends. The model is subject to the axiom 'garbage in, garbage out', meaning that the model is only as good as the assumptions it is based upon and inputs that are always changing and susceptible to error. Another issue with the DDM is that no one really knows for certain the appropriate expected rate of return to use. No DDM model is able to solve the problem of high-growth stocks. If a company's dividend growth rate exceeds the expected return rate, you get a negative denominator in the formula and we all know stocks don't have a negative value.

15.6 Gordon's Dividend Capitalization Model

The Gordon Growth Model is a variant of the discounted cash flow model that has been discussed above. It is named after Myron J. Gordon, who originally published it in 1959. Gordon's model asserts that the dividend decision of a firm is relevant and it has a bearing on the market price of the shares. Further, the model also shows that the market price of the share is favorably affected with more dividends. It is also called " a bird in the hand" theory, as dividend is more certain than the unknown appreciation in market price in the future. The model claims that dividends are good and increasing dividends will increase the value of the firm.

Given a dividend per share that is payable at the end of a given year, and the assumption that the dividend grows at a constant rate indefinitely, the model involves summing the present value of the infinite series of dividend flow to compute the current value of the share. It assumes that the company issues a dividend that has a current value of d that grows at a constant rate g. It also assumes that the required rate of return for the stock remains constant at r, which is equal to the cost of equity for that company. Hence, it is a model for determining the intrinsic value of a share, based on a future stream of dividends that grow at a constant rate.

In order to use the Gordon growth model, we need to determine the following information:

d – This represents the expected dividend at the end of the year

k – This represents the required rate of return on equity that is used as the capitalization rate for computing present value of future cash flows

g – This represents the expected growth rate of dividends which is held to remain constant in perpetuity.

The Gordon Growth Model Equation

According to Gordon, the market value of a share is equal to the present value of the future streams of dividends growing at a constant rate, g. In mathematical terms, dividend of a firm at any point of time may be computed as follows, given a constant growth rate, g:

$d_t = d_{t-1}(1+g)$

where,

d_t = dividend at time, t
d_{t-1} = dividend at time, t-1
g = constant growth rate of dividend

To understand the above equation better, let us suppose that the most recent dividend of a firm, d_0, is ` 10. If g = 5%, then expected dividend at t = 1, i.e. d_1, would be:

$= d_0(1 + g)$

= 10(1 + .05)

= 10 x 1.05

= ` 10.5

Taking the above equation further, for any time t, d_t, also equals the t = 0 dividend (most recent dividend), compounded at g for t periods, which can be written as:

$d_t = d_0(1 + g)^t$

From DDM discussed above we already know that the value of a firm for an infinite model i.e. t = ", may be computed as:

$V_0 = D_1/(1+k)^1 + \ldots\ldots + D_n/(1+k)^n + \ldots\ldots$

By incorporating the constant growth rate, g, we can write the equation for Gordon Growth Model as:

$V_0 = d_0(1 + g)/(1+k) + d_0(1 + g)^2/(1+k)^2 + \ldots\ldots + d_0(1 + g)^n/(1+k)^n + \ldots\ldots$

The above equation is a geometric series; that is each term in the expression is equal to previous term times a constant, which in this case is:

$(1 + g)/(1 + k)$.

This equation can be simplified algebraically into following more compact equation:

$V_0 = d_0(1 + g)/k\text{-}g$

Or, assuming $V_0 = P_0$ (Price equals value)

$P_0 = d_1/k\text{-}g$

Both the above equations are the same because:

$d_1 = d_0(1 + g)$

Example: A firm's dividend at the end of the year is ` 25/- and growth rate of the company is 5%. If the cost of equity 18%, what is the price at which the stock would have been purchased?

Solution:

Applying the formula,

$P_0 = d_1/r\text{-}g$

we get,

25/0.13

= ` 192.31

Please note that in above example d_1 is given directly. If most recent dividend or d_0 is given then we have to compute d_1 by following formula:

$d_1 = d_0(1 + g)$

Example: A firm's annual dividend of ` 5 has just been paid and the expected long term growth rate of the company is 5%. If the cost of equity is 8%, what is value of the stock?

Applying the formula,

$P_0 = d_1/r\text{-}g$

we get,

$P_0 = 5(1 + .05) / 0.08\text{-}0.05$

$= 5.25 / 0.03$

= ` 175

It is clear from the above two examples that the most important thing in using Gordon's equation is to make sure which dividend is given. You have to use d_1 so if d_0 is given, first d_1 needs to be computed before using Gordon' equation to calculate the value or the price of the share.

Gordon's model can also be written as:

$P_0 = E(1 - b) / k - br$

Where:

P_0	=	Price of a share
E	=	Earnings per share
b	=	Retention ratio
1 - b	=	Dividend payout ratio
k	=	Cost of capital or the capitalization rate or investors' required rate
br	=	growth rate in the rate of return on investment.

Since dividend = E (1 - b) and

g = br

Example: Determination of value of shares, given the following data:

	Case A	Case B
D/P Ratio	40	30
Retention Ratio	60	70
Cost of capital	17%	18%
r	12%	12%
EPS	Rs. 20	Rs. 20

P = $20(1 - 0.60) / 0.17 - (0.60 \times 0.12)$

= ` 81.63 (Case A)

P = $20(1 - 0.70) / 0.18 - (0.70 \times 0.12)$

= ` 62.50 (Case B)

Given

k = 11%,

E = ` 10,

calculate the stock value of share if

(a) r=12%, (b) r=11% and (c) r=10% for levels of DP ratios at 10% , 20%, 30%, 40% and 50%.

Solution:

Case I

r>k (r=12%, k=11%)

P = E(1—b) /k—br

a. DP 10%, b 90%

10(1—0.9) / 0.11-(0.9x0.12)

= 1/.002 = ` **500**

b. DP 20%, b 80%

10(1—0.8) / 0.11-(0.8x0.12)

= 2/.014 = ` **142.86**

c. DP 30%, b 70%

10(1—0.7) / 0.11-(0.7x0.12)

= 3/.026 = ` **115.38**

d. DP 40%, b 60%

10(1—0.6) / 0.11-(0.6x0.12)

= 4/.038 = ` **105.26**

e. DP 50%, b 50%

10(1—0.5) / 0.11-(0.5x0.12)

= 5/.05 = ` **100**

Case II

r=k (r=11%, K=11%)

P = E(1—b) / k—br

a. DP 10%, b 90%

10(1—0.9) / 0.11-(0.9x0.11)

= ` **90.91**

b. DP 20%, b 80%

10(1—0.8) / 0.11-(0.8x0.11)

= ` **90.91**

c. DP 30%, b 70%

10(1—0.7) / 0.11-(0.7x0.11)

= ` **90.91**

d. DP 40%, b 60%

10(1—0.6) / 0.11-(0.6x0.11)

= ` **90.91**

e. DP 50%, b 50%

10(1—0.5) / 0.11-(0.5x0.11)

= ` **90.91**

Case III

r<k (r=10%, K=11%)

P = E(1—b) / k—br

a. DP 10%, b 90%

10(1—0.9) / 0.11-(0.9x0.1)

= ` **50**

b. DP 20%, b 80%

10(1—0.8) / 0.11-(0.8x0.1)

= ` **66.67**

c. DP 30%, b 70%

10(1—0.7) / 0.11-(0.7x0.1)

= ` **75**

d. DP 40%, b 60%

10(1—0.6) / 0.11-(0.6x0.1)

= ` **80**

e. DP 50%, b 50%

10(1—0.5) / 0.11-(0.5x0.1)

= ` **83.33**

Interpretation

According to Gordon's model, price of the share varies with changins relationship between r and k. Following inferences may be drawn from above example:

- When r>k, the firm's value decreases with an increase in pay-out ratio. Market value of share is highest when DP is least and retention highest.
- When r=k, the market value of share is constant irrespective of the DP ratio. It is not affected whether the firm retains the profits or distributes them.
- When r<k, market value of share increases with an increase in DP ratio.

The equation $P_0 = d_1 / k\text{-}g$ can be manipulated to compute the required rate of return, k:

$k = d_1 / P_0 + g$

Assumptions of Gordon's Model

The Gordon growth model makes a number of assumptions about a company and its performance. The main assumptions of the model are:

- The firm is an all equity firm. No external financing is used and exclusively retained earnings fund all investment projects.
- Return on investment (r) and cost of equity (k) are constant.
- The firm has perpetual life.
- The retention ratio, once decided upon, is constant.
- The growth rate of dividends, (g = br) is also constant.
- k > br
- Tax on dividend is the same as long-term capital gains tax.
- Investors have a preference for dividends and they are the prime reason for investment.
- Corporate taxes do not exist.

Basic tenets of Gordon's Model

- Dividend policy of the firm is relevant and that investors put a positive premium on current incomes/dividends.
- This model assumes that investors are risk averse and they value certain returns and discount uncertain returns.
- Investors are rational and avoid risk.
- The rational investors can safely be expected to prefer current dividend and consider retained earnings as a risky promise. So, according to this model, if the earnings are retained, the market price of the shares would be adversely affected.
- Investors would generally prefer to pay a higher price for shares on which current dividends are paid and they would tend to discount the value of shares of a firm that postpones dividends.
- No dividends or payment of low dividends would lower the value of the shares.
- Dividends send out positive signals about the firm to the investors. If a company is performing and earning well, it will be reflected in the growth of dividends over a period of time. This in turn influences investors' sentiments in the favour of the firm, increasing the demand for the shares of the company in the secondary market. This will increase the market value of the firm. Thus the market value of the firm is dependent on the dividends declared.
- When g is very close to k, the price is very high, going to infinity when g is equal to k

Applicability and Strength of the Gordon Growth Model

- Its real value lies in its simplicity and clarity
- It is very useful for valuing dividend paying companies that are stable and growing
- Useful for valuing broad-based equity indices
- Helpful in understanding the interplay of various parameters related to a firm such as value, growth, required return and payout ratio
- Useful for estimating expected rate of return

- The model is best suited to the analysis of longer established enterprises where its assumptions are more likely to hold true to empirical testing.

Criticism of the Gordon Growth Model

- The Gordon growth model provides a simple solution for the valuation of a given share. However, the assumptions and oversimplification of the model may mean that in reality, the results can be inaccurate.
- The model has several restrictions as to its application and may only be usefully applicable to the long established and stable enterprise.
- Because the model assumes a constant growth rate, it is generally only used for mature companies with low to moderate growth rates.
- Output highly sensitive to assumptions for growth rate and required rate of return
- Not practical for valuing non-dividend paying companies
- It cannot be used for valuing dividend paying stocks with unstable growth rates.
- The assumptions of this model make it unusable for a company in its early development stage where the dividends and growth rates are unstable.
- The model, from a mathematical perspective, works only where the rate of growth is lower than the expected rate of return. But for many growth stocks, the current growth rate can vary with the cost of capital or the required rate of return significantly year by year. In that case, this model cannot be used
- The model assumes that the earnings growth is constant for perpetuity. In practice a very high growth rate cannot be sustained for a long time.
- Gordon's model is sensitive if r is close to g. For example, if

dividend = ` 1.00

cost of capital = 8%

growth rate = 1% - 2%

the price of the stock will be:

assuming 1% growth= ` 14.43 = 1.00(1.01/.07)

assuming 2% growth= ` 17.00 = 1.00(1.02/.06)

The difference determined in valuation is relatively small.

Now say the growth rate = 6% - 7%

So the price of the stock

assuming 6% growth= ` 53 = 1.00(1.06/.02)

assuming 7% growth= ` 107 = 1.00(1.07/.01)

The difference determined in valuation is large.

15.7 Lintner's Model

In 1956 John Lintner developed his model based on two important things that he observed about dividend policy:

- Companies tend to set long-run target dividend -to-earning ratios based on the availability of positive net-present-value (NPV) projects
- Earning increases are not always sustainable. As a result, dividend policy is not changed until managers can see that new earnings levels are sustainable. If a firm sticks to its target payout, it will have to change its dividend with every change in the earnings. Since shareholders do not like a drop or a wild fluctuation in dividends, the company increases the dividend only to the extent it believes is maintainable in the future. A conservative company would have a lower adjustment factor.

John Lintner surveyed dividend behavior of several firms and found that:

- Firms set long run target payout ratios
- Managers are concerned more about changes in the dividend than the absolute level of dividend
- Dividends tend to follow earnings, but dividends follow a smoother path than earnings
- Dividends are sticky in nature because managers have a reluctance to effect dividend changes that may have to be reversed

Mathematical Expression of Lintner's Model

Lintner model states that dividend policy has two parameters:

(1) the target payout ratio and

(2) the speed at which current dividends adjust to the target.

Based on the above parameters, Lintner expressed corporate dividend behavior in the form of following model:

$D_t = cr\ EPS_t + (1-c)D_{t-1}$

Where,

D_t = DPS for year t

c= Adjustment rate or Speed of 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 current 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.

Criticism of Lintner Model

- It does not compute a market price for the share.
- The adjustment factor is an arbitrary number.

15.8 Summary

Leading financial theorists have argued over whether dividends and dividend policy of a firm matters to its shareholders and various schools of thought on the importance/relevance or irrelevance of dividends to the shareholders have emerged. Dividend Irrelevance Theory suggests that dividends have

no impact on the value of a share. Therefore, investors are indifferent to receiving dividend or enjoying capital gains.According to Tax Preference Theory, dividends destroy value for shareholders because they are usually taxed at a higher rate than capital gains. The proponents of Bird in Hand theory believe that dividends are relevant and matter in positive sense. According to this view, dividends can be value increasing for many firms. Dividend Signaling Theory suggests that company announcements of an increase in dividend payouts act as an indicator of the firm possessing strong future prospects. According to Clientele Effect theory, a company's stock price will move as per the demands and goals of investors in reaction to a tax, dividend or other policy change affecting the company.

Agency theory claims that the dividends provide an incentive for the managers to reduce the costs related to the principal/agent relationship. A liberal dividend policy may lead to enhancement of the shareholder value by reducing the agency costs. The main model supporting view of irrelevance of dividends is the ***Miller and Modigliani Model (MM Hypothesis)*** whereas traditionalists such as ***Myron Gordon, John Lintner and Benjamin Graham*** have put forth models arguing that dividends are relevant. Modigilani Miller Model argues that the declaration of dividend does not affect the market price of a share. The value of a firm depends on its earnings that in turn depends on its investment policy. Thus, when the investment decision is given, the dividend decision cannot affect the value of the firm. Graham & Dodd model assigns more weight to dividends than to retained earnings while computing the market price of a share. Investors discount distant dividends at a higher rate than they discount nearby dividend. This is because nearby dividends are more certain than distant dividends. 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. The Dividend Discount Model or dividend valuation model, is the simplest and the oldest present value approach to valuing a stock. It is based on the theory that a stock is worth the discounted sum of all of its future dividends. The optimal payout ratio for a growth firm is nil. The payout ratio for a normal firm is irrelevant. The optimal payout ratio for a declining firm is 100%. 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. Gordon's theory contends that dividends are relevant. This model is of the view that dividend policy of a firm affects its value.

15.9 Key Words

- **Capital Gains :** A capital gain is a profit that results from buying a capital asset, such as stock, bond or real estate, at a lower price and selling it at a higher price.
- **Return on Investment (r) :** Rate of return or return on investment is the ratio of money gained or lost on an investment project relative to the amount of money invested.
- **Transaction Costs:** Costs incurred while buying or selling assets, such as commissions and the spread. These are in the form of fee, charged by a financial intermediary such as a bank, broker, or underwriter.
- **Floatation Costs:** It is the cost that a company incurs when it issues new shares or bonds. Flotation costs include the costs of printing the certificates, paying the underwriters, government fees, advertisement, brokerage etc.
- **Liquidity Preference Theory :** It is a theory that discusses the desire of investors to hold their money in liquid assets. Other things being equal, the theory states that people prefer to hold on to cash (liquidity) and that they usually demand a premium for investing in non-liquid assets such as bonds, stocks, and real estate.
- **Growth Firms:** Firms earning higher returns are called Growth Firms. In growth firms internal rate of return is greater than the cost of capital ($r > k$).

- **Intrinsic Value of Stock** : It is the actual value of a security, as opposed to its market price or book value. The intrinsic value includes many variables such as brand name, trademarks, and copyrights that are often dificult to calculate and sometimes not accurately reflected in the market price. It is a measure of what the company is really worth and is calculated as:

  Sum of Present Value of future Dividends + Present Value of Stock Sale Price
- **Perpetuity:** A perpetuity is an annuity that has no definite end, or a stream of cash payments that continues infinitely.

15.10 Self Assessment Test

1 Discuss various schools of thought on the importance/relevance or irrelevance of dividends to the shareholders.

2 How have MM proved the irrelevance of dividends in pricing of shares mathematically? Illustrate with example.

3 What are the basic assumptions of the dividend relevance models? On which grounds have these models been criticized?

4 Derive discounted dividend equation for following time periods:

- Single holding period
- Multiple holding period
- Infinite holding period

5 If a stock pays a ` 4 dividend this year, and the dividend has been growing 6% annually, then what will be the price of the stock next year, assuming a required rate of return of 12%?

6 A company has a capitalization rate of 10%. It currently has outstanding shares worth 25000 shares selling currently at ` 100 each. The firm expects to have a net income of ` 400000 for the current financial year and it is contemplating to pay a dividend of ` 4 per share. The company also requires ` 600000 to fund its investment requirement. Show that under MM model, the dividend payment does not affect the value of the firm.

7 A company has the following figures:

Cost of capital (k) = 0.10

Earnings per share (E) = ` 10

Rate of return on investments (r) = 8%

Dividend payout ratio: Case A: 50%

Case B: 25%

Show the effect of the dividend policy on the market price of the shares.

8 XYZ Ltd. paid a dividend of ` 5 per share for 2009-10. The company follows a fixed dividend payout ratio of 30% and earns a return of 18% on its investments. Cost of capital is 12%. Calculate the expected price of the shares of XYZ Ltd. using Walter Model.

9 A firm's annual dividend of ` 5 has just been paid and the expected long term growth rate of the company is 5%. If the cost of equity is 8%, what is value of the stock?

The earnings per share of a company are ` 10. The Equity Capitalization rate is 10%. Internal Rate of return on retained earnings is 20%.

What should be the optimum payout ratio of the company?

What should be the price of share at optimum payout ratio?

How shall this price be affected if different payout (say 80%) were employed? What kind of firm is it?

10 The earning per share of a company are ` 10 and the rate of capitalization applicable to it is 10%. The company has before it the option of adopting a payout of 20% or 40% or 80%. Using Walter's formula, compute the market value of the company's share if the productivity of retained earning is (a) 20% (b) 10% and (c) 8%. What inference can be drawn from the above exercise?

11 If a preferred share of stock pays dividends of ` 1.80 per year, and the required rate of return for the stock is 8%, then what is its intrinsic value?