FINANCIAL MANAGEMENT

MCom

III Semester

2015 Admn

UNIVERSITY OF CALICUT

SCHOOL OF DISTANCE EDUCATION

2034

CALICUT UNIVERSITY
SCHOOL OF DISTANCE EDUCATION

STUDY MATERIAL

MCom
III SEMESTER

FINANCIAL MANAGEMENT

Prepared by **Dr. P V Basheer Ahammed** Head, DCMS SAFI Institute of Advanced Study Vazhayoor-673 633	**Scrutinised by:** **DR. YAKOOB. C** RESEARCH GUIDE SULLAMUSSALAM COLLEGE, AREACODE

Settings and Lay Out By: SDE, Computer Cell

CONTENTS

UNIT 1

FOUNDATION OF FINANCE

Learning Objectives:

After reading this unit you should be able to understand the following:

- Meaning, evolution and importance of finance.
- Finance function.
- Approaches to finance function.
- Objectives of financial management.
- Financial decisions- investment, financing and dividend decisions.
- Functions of financial manager.

MEANING OF FINANCIAL MANAGEMNT

Finance is the lifeblood of a business firm. The health of every business concern mainly depends on the efficient handling of finance functions. In simple term, Financial Management may be defined as the management of the finance or funds of a business unit in order to realize the objective of the firm in an efficient manner. It is broadly concerned with the mobilization and use of funds by a business firm. Hence, finance function refers to the process of procurement of funds and the judicious use of such funds with a view to realize the objective function of a firm more effectively.

FINANCE FUNCTION

Finance function is the most important of all business functions. It remains a focus of all activities. It is not possible to substitute or eliminate this function because the business will close down in the absence of finance. The need for money is continuous. It starts with the setting up of an enterprise and remains at all times. The development and expansion of business rather needs more commitment for funds. The funds will have to be raised from various sources. The sources will be selected in relation to the implications attached with them. The receiving of money is not enough, its utilization is more important. The money once received will have to be returned also. If its use is proper, then its return will be easy otherwise it will create difficulties for repayment. The management should have an idea of using the money profitably. It may be easy to raise funds but it may be difficult to repay them. The inflows and out flows of funds should be properly matched.

APPROACHES TO FINANCE FUNCTION

A number of approaches are associated with finance function but for the sake of convenience, various approaches are divided in to two broad categories:

1. The traditional Approach
2. The modern Approach

The Traditional Approach: The traditional approach to the finance function relates to the initial stages of its evolution during 1920s and 1930s when the term 'corporation finance' was used to describe what is known in the academic world today as the 'financial management'. According to this approach, the scope, of finance function was confined to only procurement of funds needed by a business on most suitable terms.

The Modern Approach: The modern approach views finance function in broader sense. It includes both raising of funds as well as their effective utilization under the purview of finance. The finance function does not stop only by finding out sources of raising enough funds; their proper utilization is also to be considered. The cost of raising funds and the return from their use should be compared. The funds raised should be able to give more returns than the costs involved in procuring them. The utilization of funds requires decision making. Finance has to be considered as an integral part of overall management. So finance functions, according to this approach, covers financial planning, raising of funds, allocation of funds, financial control etc.

AIMS OF FINANCE FUNCTION

The primary aim of finance function is to arrange as much funds for the business as are required from time to time. This function has the following aims:

Acquiring sufficient funds: The main aim of finance function is to assess the financial needs of an enterprise and then finding out suitable sources for raising them. If funds are needed for longer periods, then long term sources like share capital, debentures, term loans etc. may be explored.

Proper utilization of funds: The effective utilization of funds is more important than raising funds. The returns from their use should be more than their cost. No fund should remain idle.

Increasing profitability: To increase profitability, sufficient funds will have to be invested. A proper control should also be exercised.

Maximizing firm's value: it is generally said that a concern's value is linked with its profitability. Besides profit, the type of sources used for raising funds, the costs of funds, the condition of money market, the demand for products etc. are some other considerations which influence a firm's value.

IMPORTANCE OF FINANCIAL MANAGEMENT.

Finance is the life blood and nerve centre of a business, just as circulation of blood is essential in the human body for maintaining life, finance is very essential to smooth running of the business. It has been rightly termed as universal lubricant which keeps the enterprise dynamic. No business, whether big, medium or small can be started without an adequate amount of finance. Right from the beginning, i.e conceiving an idea to business, finance is needed to promote or establish the business, acquire fixed assets, make investigation such as market surveys, etc., develop product, keep men and machine at work and encourage management to make progress and create values. Even an existing concern may require further finance for making improvements of expanding the business. Thus, the importance of finance cannot be over emphasized and the subject of business finance has become utmost important both to the academicians and practicing managers.

Financial management is applicable to every type of organization, irrespective of its size.

MODERN FINANCIAL DECISIONS/FUNCTIONS

With the increase in the complexities involved in the modern business decision situations, the role of finance manager has completely changed and become more complicated. His area of functions has extended, in addition to procurement of funds, to their effective and efficient utilization also. While exercising these functions, he is to keep in view the objectives the firm as well as the expectations of the suppliers of such funds. The following are the salient features of modern approach to financial management:

- Modern financial decisions are more analytical and quantitative. Application of mathematical and statistical tools has made the financial decision making more scientific.
- The scope of finance has extended to the effective utilization of funds in the light of appropriate decisions criteria.
- The management or insiders' point of view has become more dominant.

Ezra Solomon has defined the scope of modern approach to financial management as follows:

- What is the total funds requirement of the firm?
- What specific assets are to be acquired?
- What should be the pattern of financing of assets?

Investment Decision: Investment refers to the commitment of funds to various assets. The assets may be financial assets such as shares, debentures, bonds, term deposits, etc., or fixed assets like land and buildings, plant and machinery, furniture, etc., and current assets like inventory, book debts, marketable securities, cash and bank balances, etc. accordingly the investment decisions may be classified in to three types as follows:

- Securities or Portfolio investment: Investing firm's funds in financial assets;
- Capital Expenditure Decision: Investing funds in fixed assets; and
- Working Capital Management: Planning for the current assets and their financing.

Generally investment decision relates to the selection of best investment proposals and commitment of funds to such proposals in order to maximize the firm's earnings and thereby maximize the value of the firm. The Finance Manager is to evaluate different alternatives of investment based on their risk-return measures for choosing the best investment proposal and estimates the investment levels in the different fixed assets and current assets. He is to fix priorities, measure risk and uncertainty in the investment proposal, and allocate or ration out funds.

Financing Decisions: It is the one of the important functions of a Finance Manager. It relates to the procurement of funds for the firm's investment proposals and

its working capital requirements. Under this function the Finance Manager is to involve in the following decisions:

- Capitalization Decision: Under this decision the Finance Manager is to estimate the funds requirements for fixed assets and working capital purposes and also to identify the different sources available to raise such funds.
- Cost of Capital: While identifying the different sources. He is to assess the individual cost such as cost of debt, cost of equity, etc., and also the overall cost of capital of the financing mix. This will enable him to identify the best financing mix.
- Capital Structures Planning: Capital Structures refers to the debt-equity mix in the total capital employed. Depending upon the advantages and disadvantages of the debt component, the Finance Manager should determine the degree or level of gearing i.e., adding debt into the capital structure.

Dividend Decision: It is the decision relating to the distributions of earnings of the firm among the shareholders and the amount to be retained by the firm for future internal use. The Finance Manager should determine the right dividend and retention policies in order maximize the objective function of the firm. Number of factors like availability of profitable investment proposals, tax position of shareholders, the trend of earnings, etc., influence the dividend policy of a business enterprise. The Finance Manager should take in to consideration all those factors that influence the dividend policy and design an appropriate policy to the firm.

OBJECTIVES OF FINANCIAL MANAGEMENT

What business firm are seeking to achieve and therefore, what financial decisions should seek to promote is a vital question to financial management. In order to make the financial decisions more rational the firms must have an objective. It is generally agreed that the financial objective should be the maximization. However, there are different views on objective of financial management and some of them are discussed below.

Profit Maximization: Traditionally a business firm is a profit seeking economic institution and profit it used as a common and unique measurement of efficiency. Hence, profit maximization may be assumed to be a rational and appropriate financial objective for the following reasons:

- It is rational measure. A business venture is an economic activity and it attempts to maximize the utility value to the owners. Utility can be easily measured through profits. Hence, profit maximization may be considered as a rational financial objective.
- Profit maximization enables economic natural selection and only profit maxi-misers can survive at the end.
- It also maximizes socio-economic welfare.
- It will act as an incentive to face competition and be a motive force to attain growth.

Wealth Maximization: wealth may be defined as the net present worth or value of the stream of net benefits obtained from a course of action. Prof. Ezra Solomon has suggested that adoption of wealth maximization is the best criterion for the financial decisions-making. The gross present value of a course of action is equal to capitalized value of the flow of future benefits, discounted at a rate that reflects the certainty. Net present worth is the difference between the gross present worth and the amount of investment required to achieve the flow of benefits. Any financial decisions, which results in positive net worth is preferable and shall be taken up. In other words, if the course of action results in negative net worth it shall be rejected. In short maximization of wealth or net present worth may be taken as the operating objective for financial management.

Algebraically, net present worth (wealth) may be defined as follows:

$$W = \frac{B1}{[1+k]} + \frac{B2}{[1+k]} + \cdots + \frac{Bn}{[1+k]} - C$$

$$W = \sum_{t=1}^{n} \frac{B1}{(1+k)t} - C$$

Where B_1, B_2, …… B_n represent the stream of expected benefits from a course of action, C is the cost of such action, and k is the appropriate risk adjusted discount rate. W is the wealth, which is the excess of the gross present worth of the stream of benefits over the initial cost or investment. The firm should adopt a course of action when it generates positive wealth or which maximizes the wealth of the owners of the firm.

The objective of wealth maximization eliminates all the limitations of profit maximization objective.

Market Value Maximization: The wealth maximization objective is consistent with the objective of maximizing the owners' economic welfare, which in turn maximizes the utility of their consumption over time. It also enables the owners to adjust their flow of funds in such a way as to optimize their consumption. The wealth of the owners of a company is reflected by the market value of the company's shares. Hence, it is implied that the financial objective of a firm should be to maximize the market value of its shares. The market price of the shares reflects the value of the shares and it, in turn depends on the quality of financial decisions taken by the management. Hence, the market price of the share serves as an indicator of a firm's management efficiency and its progress. A firm's market price is influenced by a number of internal and external factors. In practice, innumerable factors influence the price of a particular company's share and these factors change very frequently and also vary from share to share.

BASIC CONSIDERATIONS

While taking financial decisions, the finance manager should take in to consideration their two important dimensions, viz., liquidity – profitability, and risk – return trade off. These two dimensions are like two sides of a coin. The concern for

one will automatically affect the other. For example, the concern for liquidity will affect the profitability position and the concern for profitability will affect the liquidity position of the firm. Similarly the concern for return will affect the risk component and the risk will affect the return perspective of the decisions.

Risk – Return Trade Off

Risk and return are two inherent of each and every financial decision. They are positively correlated. It means that a high return is normally associated with a high risk and low return with low risk. From the financial angle they are the relevant aspects of financial decisions. In the case of investment decisions the relevant dimensions are risk and return. A highly risky project will normally yield very high return. Otherwise the project will not qualify for selection. And a project with low risk will normally yield low return. In the case of financing decisions, the relevant dimensions are cost and return. The cost is the inverse of return and therefore, the basic dimensions are return and risk. A tradeoff between risk and return needs to be carefully analyzed in order to achieve the objective function i.e., value maximization.

Liquidity and Profitability Trade Off

Liquidity and Profitability are inherent of every financial decision. The finance manager confronts with the problems of liquidity and profitability choices while taking financial decisions. Hence, he has to strike a balance between these two. Liquidity refers to the ability of the firm to meet its short as well long – term obligations. Liquidity positions determine the solvency status of the firm. Profitability refers to the ability to the earn more profits. The profitability goal requires that the funds of the firm are so used as to yield high returns. Liquidity and profitability are closely related and negatively correlated. High liquidity will decrease profitability and high profitability with minimum cash reserve may endanger liquidity. For example, liberal credit policy may boost up sales and profits, but the liquidity will decrease.

Liquidity and risk have direct relationship. High risk may affect the liquidity of the firm. And high return will increase the profitability. Liquidity and profitability, and risk and return are interrelated and inherent qualities of each and every financial decision. While taking financial decisions, the finance manager is to strike balances between the two associated items.

FUNCTIONS OF A FINANCE MANAGER

Now, let us see what the functions of a finance manager are. The increasing pace of industrialization, rise of large scale units, innovations in information processing techniques, intense competition etc. have increased the need for financial planning and control. In the present business context, the role of a finance manager is to perform the following functions:

1) Financial forecasting and planning: A finance manager has to estimate the financial needs of a business, for purchasing fixed assets and meeting working capital needs.
2) Acquisition of funds: There are number of sources available for supplying funds, like shares, debentures, financial institutions, commercial banks etc. The

selection of an appropriate source is a difficult task to be exercised by the finance manager.

3) Investment of funds: The funds so raised should be used in the best possible way. The cost of acquiring them and the returns from their investment should be compared. The technique of capital budgeting may be helpful in selecting a project.
4) Helping in valuation decisions: A finance manager is supposed to assist the management in making valuation when mergers and consolidations take place.
5) Maintain proper liquidity: Every concern is required to maintain some liquidity for meeting day-to-day needs. A finance manager is required to determine the need for liquid assets and then arrange liquid assets in such a way that there is no scarcity of funds.

Review Questions:

1. What do you mean by business finance? Discuss various approaches to finance functions.
2. What is finance function? What are its objectives?
3. What is financial management?
4. What major decisions are required to be taken in finance?
5. A) What are the responsibilities of a finance manager?
   B) What are the prominent areas of financial decision making?
6. Write a note on profit maximization and wealth maximization.
7. Why is maximizing wealth a better goal than maximizing profit?
8. Explain the objectives of financial management.

UNIT- 2
SOURCES OF FINANCE

Learning Objectives:

- Various sources of raising short-term and long-term funds
- Kinds of ownership securities and their evaluation.
- Kinds of creditors ship securities.
- Internal financing
- Loan financing.
- Specialized financial institutions
- Innovative sources of finance.
- Focus on long-term sources of finance.

INTRODUCTION

Having learnt the meaning and importance of financial management in the last unit, we shall examine the various sources from which the required finance can be raised.

In our present day economy, finance is defined as the provision of money at the time when it is required. Every enterprise, whether big, medium or small, needs finance to carry on its operations and to achieve its targets.

Capital required for a business can be classified under two main categories, viz.,

(i) Fixed Capital, and

(ii) Working capital.

Every business needs funds for two purposes-for its establishment and to carry out its day-to-day operations. Long-term funds are required to create production facilities through purchases of fixed assets such as plant, machinery, land, building, furniture, etc. Investments in these assets represent that part of firm's capital which is blocked on a permanent or fixed basis and is called fixed capital. Funds are also needed for short-term purposes for the purchase of raw materials, payment of wages and other day-to-day expenses, etc. These funds are known as working capital.

The various sources of raising long-term funds include issue of shares, debentures, ploughing back of profits and loans from financial institutions, etc. The short-term requirements of funds can be met from commercial banks, trade credit, installment credit, advances, factoring or receivable credit, accruals, deferred incomes, and commercial paper, etc. The various sources of finance have been classified in many ways, such as:

1. According to Period

(a) Short-term sources, viz; bank credit, customer advances, trade credit, factoring, accruals, commercial paper, etc.

(b) Medium-term sources, viz; Issue of preference shares, debentures, and bank loans, public deposits/fixed deposits, etc.

(c) Long term sources, *viz;* issue of shares, debentures, ploughing back of profits, loans from specialized financial institutions, etc

2. According to Ownership

(a) Owned capital, viz., share capital, retained earnings, profits and surpluses, etc.

(b) Borrowed capital such as debentures, bonds, public deposits, loans, etc.

3. According to Source of Finance

(a) Internal sources such as ploughing back of profits, retained earnings, profits, surpluses and depreciation funds, etc.

(b) External sources, viz; shares, debentures, public deposits, loans, etc.

4. According to Mode of Financing

(a) Security financing or External Financing; i.e., financing through raising of corporate securities such as shares, debentures etc.

(b) Internal financing, i.e., financing through retained earnings, capitalisation of profits and depreciation of funds, etc.

(c) Loan financing through raising of long-term and short term loans.

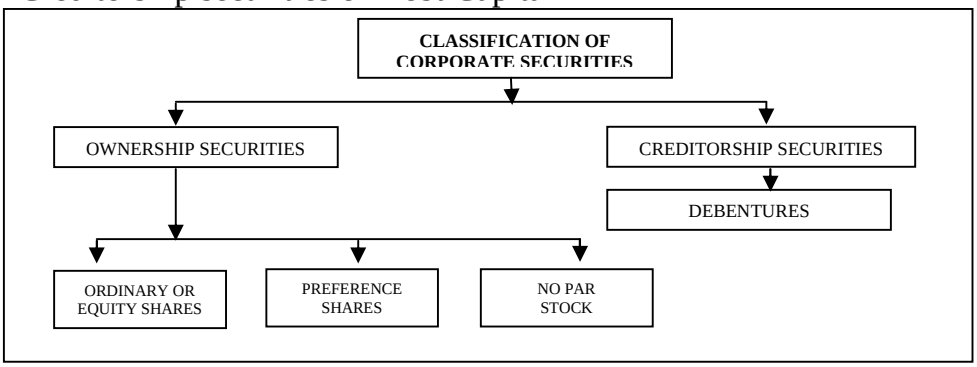
For the sake of convenience, let us discuss the various sources of finance according to the mode of financing in this unit.

I SECURITY FINANCING

Corporate securities can be classified under two categories;

(a) Ownership securities or capital stock

(b) Creditorship securities or Debt Capital



A. OWNERSHIP SECURITIES

The term 'ownership securities', also known as 'capital stock' represents shares. Shares are the most universal form of raising long-term funds from the market.

The various kinds of shares are discussed as follows:

1. Equity Shares

Equity shares, also known as ordinary shares or common shares represent the owners' capital in a company. The holders of these shares are the real owners of the company. They have a control over the working of the company. Equity shareholders are paid dividend after paying it to the preference shareholders. They may be paid a higher rate of dividend or they may not get anything.

2. Preference Shares

As the name suggests, these shares have certain preferences as compared to other types of shares. These shares are given two preferences. There is a preference for payment of dividend at a fixed rate, whenever the company has distributable profits. The second preference for these shares is the repayment of capital at the time of liquidation of the company.

B. Creditorship Securities

The term 'creditorship securities', also known as 'debt capital', represents debentures and bonds. They occupy a very significant place in the financial plan of the company. A debenture or a bond is a certificate issued by a company under its seal acknowledging a debt due by it to its holders.

DEBENTURES OR BONDS

A debenture is an acknowledgement of a debt. According to Thomas Evelyn. "A debenture is a document under the company's seal which provides for the payment of a principal sum and interest thereon at regular intervals. A debenture holder is a creditor of the company.

Types of Debentures

The debentures are of the following types:

(a) **Simple, Naked or Unsecured Debentures.** These debentures are not given any security on assets. They have no priority as compared to other creditors.

(b) **Secured or Mortgaged Debentures.** These debentures are given security on assets of the company. In case of default in the payment of interest or principal amount, debenture holders can sell the assets in order to satisfy their claims.

(c) **Bearer Debentures.** These debentures are easily transferable. They are just like negotiable instruments. The debentures are handed over to the purchaser without any registration deed.

(d) **Registered Debentures.** As compared to bearer debentures which are transferred by mere delivery, registered debentures require a procedure to be followed for their transfer. Both the transferer and the transferee are expected to sign a transfer voucher. The form is sent to the company along with the registration fees. The name of the purchaser is entered in the register.

(e) **Redeemable Debentures.** These debentures are to be redeemed on the expiry of a certain period. The interest on the debentures is paid periodically but the principal amount is returned after a fixed period. The time for redeeming the debentures is fixed at the time of their issue.

(f) **Irredeemable Debentures.** Such debentures are not redeemable during the life time of the company. They are payable either on the winding up of the company or at the time of any default on the part of the company.

(g) **Convertible Debentures.** Sometimes convertible debentures are issued by a company and the debenture holders are given an option to exchange the debentures into equity shares after the lapse of a specified period.

Convertible debentures may be either **'Fully Convertible Debentures'** (FCD's) or '**Partly Convertible Debentures'** (PCD's) with or without buy back facilities. Fully convertible debentures are converted into equity shares after the lapse of a certain period specified at the time of issue of such debentures. PCD's are converted into equity shares partly and the balance is not converted into equity.

(h) **Zero Interest Bonds/ Debentures.** Zero interest bond is an instrument recently introduced in India by some companies. It is usually a convertible debenture which yields no interest.

(i) **Zero Coupon Bonds.** Another instrument which has recently become popular in India is the zero coupon bond (ZCB). Zero coupon bond does not carry any interest but it is sold by the issuing company at deep discount from its eventual maturity value. The difference between the issue price and the maturity value represents the gain or interest earned by its investor.

(j) **First Debentures and Second Debentures.** From the view of priority in the payment of interest and repayment of the principal amount, the debentures may be either first debentures or second debentures, etc.

(k) **Guaranteed Debentures.** These are debentures or bonds on which the payment of interest and principal is guaranteed by third parties, generally, banks and Government etc.

(l) **Collateral Debentures.** A company may issue debentures in favour of a lender of money, generally the banks and financial institutions, as a collateral, i.e subsidiary or secondary, security for a loan raised by it.

(m) **Other Innovative Debt Instruments.** In the fast changing capital market scenario, the corporate sector has devised many other innovative debt instruments for raising funds from the market. Some of these are outlined below.

(i) **Equity Warrants.** The equity warrant is a paper attached to a bond or preferred stock that gives the holder the right to buy a fixed number of company's equity shares at a predetermined price at a future date.

(ii) **Secured Premium Notes (SPNs).** The secured premium note is a tradable instrument with detachable warrant against which the holder gets equity shares after a fixed period of time.

(iii) **Callable Bond.** A callable bond is a bond that can be called in and paid off by the issuer at a price, called the 'call price', stipulated in the bond contract.

(iv) **Floating/Variable or Adjustable Rate Bonds.** The rate of interest payable on these bonds varies periodically depending upon the market rate of interest payable on the gilt edged securities.

(v) **Deep Discount Bonds (DDBs).** The deep discount bond does not carry any interest but it is sold by the issuer company at a deep discount from its eventual maturity (nominal) value. The industrial Development Bank of India (IDBI) issued such DDBs for the first time in the Indian capital market at a price of Rs.2,700 against the nominal value of Rs.1 lakh payable after 25 years.

(vi) **Inflation Adjusted Bonds (IABs).** These are the bonds on which both interest as well as principal is adjusted in line with the price level changes or the inflation rate.

I RETAINED EARNINGS OR PLOUGHING BACK OF PROFITS

The 'Ploughing Back of Profits' is a technique of financial management under which all profits of a company are not distributed amongst the share holders as dividend, but a part of the profits is retained or reinvested in the company. This process of retaining profits year after year and their utilisation in the business is known as ploughing back of profits.

It is actually an economical step which a company takes, in the sense, that instead of distributing the entire earnings by way of dividend, it keeps a certain percentage of it to be re-introduced into the business for its development. Such a phenomenon is also known 'Self-Financing'; Internal Financing; or 'Inter Financing'.

The Necessity of Ploughing Back

The need for re-investment of retained earnings or ploughing back of profits arises for the following purposes:

1. For the replacement of old assets which have become obsolete.
2. For the expansion and growth of the business.

3. For contributing towards the fixed as well as working capital needs of the company.
4. For improving the efficiency of the plant and equipment.
5. For making the company self-dependent of finance from outside sources.
6. For redemption of loans and debentures.

III LOAN FINANCING

The third important mode of finance is raising of both (i) short-term loans and credits; and (ii) term loans including medium and short-term loans. These sources of finance have been discussed in the following pages of this unit.

1. Indigenous Bankers

Private money lenders and other country bankers used to be the only sources of finance prior to the establishment of commercial banks.

2. Trade Credit

Trade credit refers to the credit extended by the suppliers of goods in the normal course of business. As present day commerce is built upon credit, the trade credit arrangement of a firm with its suppliers is an important source of short-term finance.

3. Installment Credit

This is another method by which the assets are purchased and the possession of goods is taken immediately but the payment is made in installments over a pre-determined period of time.

4. Advances

Some business houses get advances from their customers and agents against orders and this source is a short-term source of finance for them.

5. Factoring or Accounts Receivable Credit

Another method of raising short-term finance is through account receivable credit offered by commercial banks and factors. A commercial bank may provide finance by discounting the bills or invoices of its customers. Thus, a firm gets immediate payment for sales made on credit. A factor is a financial institution which offers services relating to management and financing of debts arising out of credit sales. Factoring is becoming popular all over the world on account of various services offered by the institutions engaged on it. Factors render services varying from bill discounting facilities offered by commercial banks to a total takeover of administration of credit sales including maintenance of sales ledger, collection of accounts receivables, credit control and protection from bad debts, provision of finance and rendering of advisory services to their clients.

6. Accrued Expenses

Accrued expenses are the expenses which have been incurred but not yet due and hence not yet paid also. These simply represent a liability that a firm has to pay

for the services already received by it. The most important items of accruals are wages and salaries, interest and taxes.

7. Deferred Incomes

Deferred incomes are incomes received in advance before supplying goods or services. They represent funds received by a firm for which it has to supply goods or services in future.

8. Commercial Paper

Commercial paper represents unsecured promissory notes issued by firms to raise short-term funds. It is an important money market instrument in advanced countries like USA. In India, the Reserve Bank of India introduced commercial paper in the Indian money market on the recommendations of the Working Group on Money Market (Vaghul Committee).

The maturity period of commercial paper, in India, mostly ranges from 91 to 180 days. It is sold at a discount from its face value and redeemed at face value on its maturity. Commercial paper is usually bought by investors including banks, insurance companies, unit trusts and firms to invest surplus funds for a short-period.

9. Commercial Banks

Commercial banks are the most important source of short-term capital. The major portion of working capital loans are provided by commercial banks. They provide a wide variety of loans tailored to meet the specific requirements of a concern. The different forms in which the banks normally provide loans and advances are as follows:

(a) Loans
(b) Cash Credits
(c) Overdrafts
(d) Purchasing and discounting of bills

(a) **Loans:** When a bank makes an advance in lump-sum against some security it is called a loan. In case of a loan, a specified amount is sanctioned by the bank to the customer. The entire loan amount is paid to the borrower either in cash or by credit to his account. Commercial banks generally provide short-term loans up to one year for meeting working capital requirements. But, now –a-days, term loans exceeding one year are also provided by banks. The term loans may be either medium-term or long-term loans.

(b) **Cash Credit:** A cash credit is an arrangement by which a bank allows his customer to borrow money up to a certain limit against some tangible securities or guarantees. The customer can withdraw from his cash credit limit according to his needs and he can also deposit any surplus amount with him.

(c) **Overdrafts:** Overdraft means an agreement with a bank by which a current account-holder is allowed to withdraw more than the balance to his credit up to a certain limit. There are no restrictions for operation of overdraft limits.

(d) **Purchasing and Discounting of Bills:** Purchasing and discounting of bills is the most important form in which a bank lends without any collateral security. The seller draws a bill of exchange on the buyer of goods on credit. Such a bill may be either a clean bill or a documentary bill which is accompanied by documents of title to goods such as a railway receipt.

Letter of Credit

L/C is simply a guarantee by the bank to the suppliers that their bills up to a specified amount would be honored. In the case the customer fails to pay the amount, on the due date, to its suppliers, the bank assumes the liabilities of its customer for the purchases made under the letter of credit arrangement.

10. Public Deposits

Acceptance of fixed deposits from the public by all type of manufacturing and non-bank financial companies in the private sector has been a unique feature of Indian Financial system. Companies have been accepting deposits directly from the public by offering higher rates of interest as compared to banks and post offices to meet their requirements of funds. But even by offering higher rates of interest to the investors, the cost of funds raised through public deposits to the companies has been lower than the minimum rate of interest on bank advances.

B. TERM LOANS

In addition to the raising of funds by means of share capital, debentures, public deposits and internal financing, firms may also raise term loans for meeting their medium-term and long-term financial needs. Medium-term loans are for periods ranging from one to five years and long-term loans are granted for periods beyond five years. There are two major sources of term lending, *(a)* Specialized Financial Institutions or Development Banks; and *(b)* Commercial Banks.

(a) **Specialised Financial Institutions Or Development Banks**

After independence a number of financial institutions have been set up at all India and regional levels for accelerating the growth of industries by providing financial and other assistance required.

There are four important financial institutions at the national level i.e., the Industrial Finance Corporation of India (IFCI), Industrial Development Bank of India (IDBI), Industrial Credit and Investment Corporation of India (ICICI), and Industrial Reconstruction Corporation of India (IRCI) now called Industrial Investment Bank of India Ltd., (IIBIL). In addition, there are 19 State Financial Corporation's (SFCs) and 24 State Industrial Development Investment Corporations. Apart from these specialized Financial Institutions, Commercial banks, industrial co-operatives, small

industrial development corporations, Unit Trust of India, Life Insurance Corporation, National Industrial Development Corporation, etc. also provide finances for the development of industries in the country. Besides these institutions commercial banks provide short term as well long term finances. The Reserve bank of India is also providing industrial finance through other financial institution.

(b) **Term Financing By Commercial Banks**

Commercial banks normally concentrated on providing short-term financial assistance to industrial sector. The working capital needs of industrial enterprises were met. A massive investment in industries during second plan and after changed the priority of bank lending.

SOME OTHER INNOVATIVE SOURCES OF FINANCE

1. **Venture Capital**

The term 'venture capital' represents financial investment in a highly risky project with the objective of earning a high rate of return. There is a significant scope for venture capital companies in our country because of increasing emergence of technocrat entrepreneurs who lack capital to be risked. These venture capital companies provide the necessary risk capital to the entrepreneurs so as to meet the promoters' contribution as required by the financial institutions. In addition to providing capital, these VCFs (Venture capital firms) take an active interest in guiding the assisted firm.

2. **Seed Capital**

At the time of financing a project, financial institutions always insist that the promoter should contribute a minimum amount, called promoter's contribution, towards the project. But there are number of technically qualified entrepreneurs who lack financial capability to provide the required amount of contribution. The Industrial Development Bank of India (IDBI) has opened schemes to provide such funds to the 'eligible' entrepreneurs.

3. **Bridge Finance**

There is usually a time gap between the date of sanctioning of a term loan and its disbursement by the financial institution to the concerned borrowing firm. In the same manner, there may be a time gap between the sanctioning of a grant or subsidy and its actual release by the Government or the institution. The same delay may occur in case of public issue of shares with regard to receipt of public subscription. Therefore, to avoid delay in implementation of the project, the firms approach commercial banks for short-term loans for the period for which delay may otherwise occur. Such a loan is called 'Bridge Finance'.

4. Lease Financing

In addition to debt and equity financing, leasing has emerged as another important source of intermediate and long-term financing of corporate enterprises. Leasing is an arrangement that provides a firm with the use and control over assets without buying, the cost of leasing the asset should be compared with the cost of financing the asset through normal sources of financing, i.e., debt and equity. Since payment of lease rentals is similar to payment of interest on borrowings and lease financing is equivalent to debt financing, financial analysts argue that the only appropriate comparison is to compare the cost of leasing with that of cost of borrowing. Hence, lease financing decisions relating to leasing or buying options primarily involve comparison between the cost of debt-financing and lease financing.

Types of Leasing

There are two basic kinds of leases:

1. Operating or Service Lease
2. Financial Lease

1. Operating or Service Lease

An operating lease is usually characterized by the following features:

(i) It is a short-term lease on a period to period basis. The lease period in such a contract is less than the useful life of the asset.

(ii) The lease is usually cancelable at short-notice by the lessee.

(iii) As the period of an operating lease is less than the useful life of the asset, it does not necessarily amortize the original cost of the asset. The lessor has to make further leases or sell the asset to recover his cost of investment and expected rate of return.

(iv) The lessee usually has the option of renewing the lease after the expiry of lease period.

(v) The lessor is generally responsible for maintenance, insurance and taxes of the asset. He may also provide other services to the lessee.

(vi) As it is short-term cancelable lease, it implies higher risk to the lessor but higher lease rentals to the lessee.

2. Financial Lease

A lease is classified as financial lease if it ensures the lessor for amortization of the entire cost of investment plus the expected return on capital outlay during the term of the lease. Such a lease is usually for a longer period and non-cancelable. As a source of funds, the financial lease is an alternative similar to debt financing.

A financial lease is usually characterized by the following features:

(i) The present value of the total lease rentals payable during the period of the lease exceeds or is equal to substantially the whole of the fair value of the leased asset. It

implies that within the lease period, the lessor recovers his investment in the asset along with an acceptable rate of return.

(ii) As compared to operating lease, a financial lease is for a longer period of time.

(iii) It is usually non-cancelable by the lessee prior to its expiration data.

(iv) The lessee is generally responsible for the maintenance, insurance and service of the asset. However, the terms of lease agreement, in some cases may require the lessor to maintain and service the asset. Such an arrangement is called *'maintenance or gross lease'*. But usually an operating lease, it is the lessee who has to pay for maintenance and service costs and such a lease is known as 'net lease'.

(v) A financial lease usually provides the lessee an option of renewing the lease for further period at a nominal rent.

Forms of Financial Lease

The following are the important kinds of financial lease arrangements:

(i) **Sale and Leaseback.** A sale and leaseback arrangement involves the sale of an asset already owned by a firm (vendor) and leasing of the same asset back to the vendor from the buyer.

(ii) **Direct Leasing.** In contrast with sale and leaseback, under direct leasing a firm acquires the use of an asset that it does not already own. A direct lease may be arranged either from the manufacturer supplier directly or through the leasing company.

(iii) **Leveraged Lease.** A leveraged lease is an arrangement under which the lessor borrows funds for purchasing the asset, from a third party called lender which is usually a bank or a finance company. The loan is usually secured by the mortgage of the asset and the lease rentals to be received from the lessee.

(iv) **Straight Lease and Modified Lease.** Straight lease requires the lessee firm to pay lease rentals over the expected service life of the asset and does not provide for any modifications to the terms and conditions of the basic lease.

Modified lease, on the other hand, provides several options to the lessee during the lease period. For example, the option of terminating the lease may be providing by either purchasing the asset or returning the same.

(v) **Primary and Secondary Lease (Front-ended and Back-ended Lease).** Under primary and secondary lease, the lease rentals are changed in such a manner that the lesser recovers the cost of the asset and acceptable profit during the initial period of the lease and then a secondary lease is provided at nominal rentals. In simple words, the rentals charged in the primary period are much more than that of the secondary period. This form of lease arrangement is also known as front-ended and back-ended lease.

5. Hire Purchase Finance

Hire purchase means a transaction where goods are purchased and sold on the terms that *(i)* payment will be made in installments, *(ii)* the possession of the goods is given to the buyer immediately, *(iii)* the property (ownership) in the goods remains with the vendor till the last installment is paid, *(iv)* the seller can repossess the goods in case of default in payment of any installment and *(v)* each installment is treated as hire charges till the last installment is paid.

Leasing Versus Hire Purchase

Both Leasing and hire purchase provide a source of financing fixed assets. However the two are not similar on many accounts. The following points of distinction are worth consideration from points of view of the lessee and the hirer:

Point of Difference	Leasing	Hire Purchase
1. Ownership	Ownership is not transferred to the lessee	Ownership is transferred to the hirer on payment of last installment
2. Tax Deductibility	Entire lease rentals are tax-deductible expenses	Only the interest component and not the entire installment is deductible
3. Depreciation and other Allowances	Cannot be claimed by the lessee	Can be claimed by the hirer
4. Salvage Value	Lessee cannot realise salvage value of the asset on the expiry of the lease of life of the asset.	Hirer can realise the salvage value of the asset after payment of last installment and expiry of the life of the asset

6. Euro Issues

Euro issue is a method of raising funds required by a company in foreign exchange. It provides greater flexibility to the issuers for raising finance and allows room for controlling their cost of capital. The term 'Euro issue' means an issue made abroad through instruments denominated in foreign currency and listed on an European stock exchange, the subscription for which may come from any part of the world. The idea behind Euro issues is that any one capital market can absorb only a limited amount of company's stock at any given time and cost. The following are the primary instruments through which finance is raised by Indian companies in International market:

(i) Foreign Currency convertible Bonds (FCCBs)
(ii) Global Depository Receipts (GDRs).
(iii) American Depository Receipts (ADRs)

(i) **Foreign Currency convertible Bonds.** FCCBs are bonds issued to and subscribed by a non-resident in foreign currency which are convertible into certain number of ordinary shares at a pre-fixed price. They are like convertible debentures,

have a fixed interest rate and a definite maturity period. These bonds are listed on one or more overseas stock exchanges. Euro convertible bonds are listed on a European Stock Exchange. The issuer company has to pay interest on FCCBs in foreign currency till the conversion takes place and if the conversion option is not exercised by the investor, the redemption of bond is also to be made in foreign currency. Essar Gujarat, Reliance Industries, ICICI, TISCO and Jindal Strips are some of the Indian companies which have successfully issued such bonds.

(ii) **Global Depository Receipts**. GDR is an instrument, denominated in dollar or some other freely convertible foreign currency, which is traded in Stock |Exchanges in Europe or the US or both. When a company issues equity outside its domestic market, and the equity is subsequently traded in the foreign market, it is usually in the form of a Global Depository |Receipt. Through the system of GDRs; the shares of a foreign company are indirectly traded. The issuing company works with a bank to offer to its shares in a foreign country via the sale of GDRs. The bank issues GDRS as an evidence of ownership.

(iii) **American Depository Receipts (ADRs)** are the US version of GDRs. American Depository Receipts have almost the same features as of GDRs with a special feature that ADRs are necessarily denominated in US dollars and pay dividend in US dollars.

REVIEW QUESTIONS

Essay Type Questions

1. Between equity shares and debentures which is profitable for raising additional long-term capital for a manufacturing company and why?
2. What different forms of securities can a public limited company issue? Discuss their significance in detail in relation to the financial structure of a company.
3. "Debentures occupy a very important place in the financial plan". Discuss the statement and point out the limitations of debenture financing.
4. What are various sources available to Indian businessmen for raising funds? Explain.
5. What are the main sources of finance available to industries for meeting short-term as well as long-tem financial requirements? Discuss.
6. "Leasing is beneficial to both, the lessee as well as the lessor." Examine.

UNIT - 3

WORKING CAPITAL MANAGEMENT- PART - 1

Learning Objectives:

- Understand the meaning, concept and kinds of working capital.
- Importance of adequate working capital.
- Forecast working capital requirements

We have seen the different sources from which both long term and short term capital can be raised. In this unit a detailed study is made regarding the working capital requirements, its estimation, and various methods of estimating working capital requirements.

MEANING OF WORKING CAPITAL

Capital required for a business can be classified under two main categories viz.,

(i) Fixed Capital, and

(ii) Working Capital.

Every business needs funds for two purposes-for its establishment and to carry out its day-to-day operations. Long-term funds are required to create production facilities through purchase of fixed assets such as plant and machinery, land, building, furniture, etc. Investments in these assets represent that part of firm's capital which is blocked on a permanent or fixed basis and is called fixed capital. Funds are also needed for short-term purposes for the purchase of raw materials, payment of wages and other day-to-day expenses, etc. These funds are known as working capital. In simple words, working capital refers to that part of the firm's capital which is required for financing short term or current assets such as cash, marketable securities, debtors and inventories. Funds, thus, invested in current assets keep revolving fast and are being constantly converted into cash and these cash flows out again in exchange for other current assets. Hence, it is also known as *revolving or circulating capital* or short-term capital.

In the words of *Shubin*, "Working capital is the amount of funds necessary to cover the cost of operating the enterprise."

According to *Gerstenberg*, "Circulating capital means current assets of a company are changed in the ordinary course of business from one form to another, as for example, from cash to inventories, inventories to receivables, receivables into cash."

CONCEPTS OF WORKING CAPITAL

There are two concepts of working capital:

(A) Balance Sheet Concept

(B) Operating Cycle or Circular Flow Concept

(A) Balance Sheet Concept

There are two interpretations of working capital under the balance sheet concept:

(i) Gross Working Capital

(ii) Net Working Capital.

Gross Working Capital = Total of current assets

Net Working Capital = Current Assets - Current liabilities.

Net working capital may be positive or negative. When the current assets exceed the current liabilities the working capital is positive and the negative working capital results when the current liabilities are more than the current assets. Current assets are those assets which can be converted into cash within a short span of time, normally one accounting year or even less than that. Current liabilities are those liabilities which are intended to be paid in the ordinary course of business within a short period of normally one accounting year out of the current assets or the income of the business.

Examples of current assets are:

Constituents of Current Assets	
1.	Bills Receivable.
2.	Sundry debtors or Accounts receivable.
3.	Accrued or outstanding income.
4.	Prepaid expenses, short term marketable securities etc.
5.	Inventory (Stock of Raw Materials, Work in Progress and Finished Goods).
6.	Cash in hand and at Bank.

Examples of current liabilities are:

Constituents of Current Liabilities	
1.	Bills payable.
2.	Sundry creditors or accounts payable.
3.	Accrued or outstanding expenses.
4.	Short-term loans, advances and deposits.
5.	Dividends payable.
6.	Bank overdraft.
7.	Provision for taxation, if it does not amount to appropriation of profits.

The gross working capital concept is financial or going concern concept whereas net working capital concept is accounting concept of working capital.

The following example explains both the concepts of working capital:

Balance Sheet of Pearl India Ltd.
as on 31.3.2016.

Liabilities	Rs.	**Assets**	Rs.
Equity Shares	2,00,000	Goodwill	20,000
8% Debentures	1,00,000	Land and Buildings	1,50,000
Reserve & Surplus	50,000	Plant and Machinery	1,00,000
Sundry Creditors	1,50,000	Inventories:	
Bills Payable	30,000	Finished Goods	60,000
Outstanding Expenses	20,000	Work-in-progress	40,000
Bank Overdraft	50,000	Prepaid Expenses	20,000
Provision of Taxation	20,000	Marketable Securities	60,000
Proposed Dividend	30,000	Sundry Debtors	90,000
		Bills Receivables	20,000
		Cash & Bank Balances	90,000
	6,50,000		6,50,000

(i) Gross Working Capital = Total of Current Assets

= 60,000+40,000+20,000+60,000+90,000+20,000+90,000= Rs.3,80,000

(ii) Net Working Capital=Current Assets-Current Liabilities

Total of Current Assets = Rs.3,80,000

Total of Current Liabilities =

1, 50,000+30,000+20,000+50,000+20,000+30,000 = Rs.3,00,000

WC (Net) = Rs 3,80,000-3,00,000 = Rs.80,000

B) Operating Cycle or Circular Flow Concept

As discussed earlier, working capital refers to that part of firm's capital which is required for financing short-term or current assets such as cash, marketable securities, debtors and inventories. Funds, thus, invested in current assets keep revolving fast and are being constantly converted into cash and these cash flows out again in exchange for other current assets. Hence, it is also known as revolving or circulating capital. The circular flow concept of working capital is based upon this operating or working capital cycle of a firm. The cycle starts with the purchase of raw material and other resources and ends with the realisation of cash from the sale of finished goods. The speed/time duration required to complete one cycle determines the requirements of working capital-longer the period of cycle, larger is the requirement of working capital.

The gross operating cycle of a firm is equal to the length of the inventories and receivables conversion periods. Thus,

Gross Operating Cycle = RMCP+WIPCP+FGCP+RCP

Where RMCP = Raw Material Conversion Period
WIPCP = Work-in-Process Conversion Period
FGCP = Finished Goods Conversion Period
RCP = Receivables Conversation Period

However, a firm may acquire some resources on credit and thus defer payments for certain period. In that case, net operating cycle period can be calculated as below:

Net operating cycle period = Gross operating cycle period-payable deferral period

Further, following formula can be used to determine the conversion periods.

1. Raw Material Conversion Period = $\frac{\text{Average Stock of Raw Material}}{\text{Raw Material Consumption per Day}}$

2. Work-in-Process Conversion Period = $\frac{\text{Average Stock of Work - in Progress}}{\text{Total Cost of Production Per Day}}$

3. Finished Goods Conversion Period = $\frac{\text{Average Stock of Finished Goods}}{\text{Total Cost of Goods Sold Per Day}}$

4. Receivable Conversion Period = $\frac{\text{Average Account Receivables}}{\text{Net Credit Sales Per Day}}$

5. Payable Deferral Period = $\frac{\text{Average Payables}}{\text{Net Credit Purchases Per Day}}$

The following example explains the determination of operating cycle.

Problem.1. From the following information extracted from the books of a manufacturing concern compute the operating cycle in days:

Period covered	365 days
Average period of credit allowed by suppliers	16 days
	(Rs '000)
Average total of debtors outstanding	480
Raw material consumption	4,400
Total production cost	10,000
Total cost of goods sold for the year	10,500
Sales for the year	16,000
Value of average stock maintained:	
Raw materials	320
Work-in-progress	350
Finished goods	260

Solution

Computation of Operating Cycle:

(a) Length of Raw Material Inventory Period $= \frac{\text{Average Stock of Raw Material}}{\text{Raw Material Consumption per Day}}$

$= \frac{320}{440} \times 365 = 27 \text{days}$

(b)	Length of Work-in-Progress Conversion Period	$= \frac{\text{Average Stock of Work - in - Progress}}{\text{Total Cost of Production Per Day}}$ $= \frac{350}{10,000} \times 365 = 13\text{days}$
(c)	Length of Finished Stock Period	$= \frac{\text{Average Stock of Finished Goods}}{\text{Total Cost of Goods Sold Per Day}}$ $= \frac{260}{10,500} \times 365 = 9\text{days}$
(d)	Period of Credit Allowed to Debtors	$= \frac{\text{Average Total of Debtors Outstandin}}{\text{Sales Per Day}}$ $= \frac{480}{16,000} \times 365 = 11\text{days}$
(e)	Gross Total period of operating cycle (a+b+c+d)	60 days
	Less : Average period of credit allowed by suppliers	16 days
	Net total period of operating cycle	44 days

Problem 2. From the following data, compute the duration of operating cycle for each of the two companies:

	X Ltd. Rs	**Y Ltd.** Rs
Stock		
Raw materials	40,000	60,000
Work-in-process	30,000	45,000
Finished goods	25,000	38,000
Purchase/consumption of raw material	1,60,000	2,70,000
Cost of goods produced/sold	3,00,000	3,80,000
Sale (all credit)	3,60,000	4,32,000
Debtors	72,000	1,08,000
Creditors	20,000	27,000

Assume 360 days per year for computational purposes.

Solution:

Computation of Operating Cycle		
	X Ltd.	**Y Ltd.**
a *Raw material conversion/holding period* $\frac{\text{Stock of Raw Material}}{\text{Raw Material Consumption per Day}}$	$\frac{40,000}{1,60,000}\times 360 = 90\text{days}$	$\frac{60,000}{2,70,000}\times 360 = 80\text{ days}$
b *Work-in-process conversion period* $\frac{\text{Stock of Work - in - Progress}}{\text{Cost of goods Produced Per Day}}$	$\frac{30,000}{3,00,000}\times 360 = 36\text{days}$	$\frac{45,000}{3,80,000}\times 360 = 43\text{ days}$
c *Finished goods holding period* $\frac{\text{Stock of finished goods}}{\text{Cost of goods sold Per Day}}$	$\frac{25,000}{3,00,000}\times 360 = 30\text{ days}$	$\frac{38,000}{3,80,000}\times 360 = 36\text{ days}$
d *Receivable conversion period* $\frac{\text{Debtors}}{\text{Credit sales per day}}$	$\frac{72,000}{3,60,000}\times 360 = 72\text{ days}$	$\frac{1,08,000}{4,32,000}\times 360 = 90\text{ days}$
e *Payables deferral period* $\frac{\text{Creditors}}{\text{Purchases per day}}$	$\frac{20,000}{1,60,000}\times 360 = 45\text{ days}$	$\frac{27,000}{2,70,000}\times 360 = 36\text{ days}$
Gross duration of operating cycle (a+b+c+d)	228 days	249 days
Net duration of operating cycle (a+b+c+d-e)	183 days	213 days

CLASSIFICATION OR KINDS OF WORKING CAPITAL

Working capital may be classified in two ways:

(a) On the basis of concept

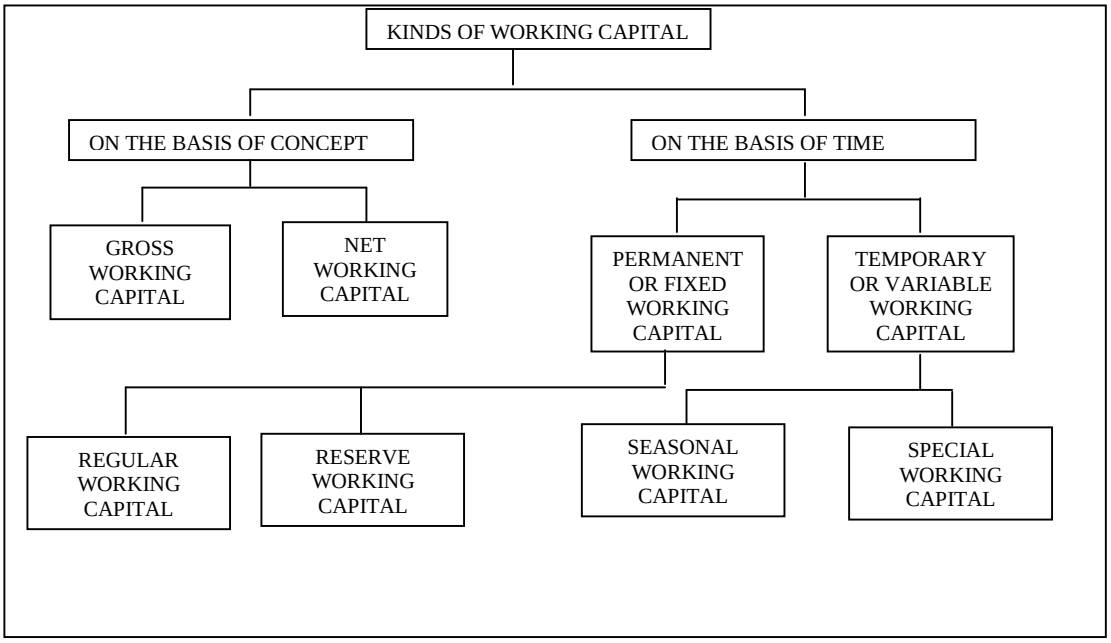
(b) On the basis of time.

On the basis of concept, working capital is *classified as gross working capital and net working capital* as discussed earlier. This classification is important from the point of view of the financial manager.

On the basis of time, working capital may be classified as:

1. Permanent or fixed working capital.

2. Temporary or variable working capital.



1. Permanent or Fixed Working Capital: Permanent or fixed working capital is the minimum amount which is required to ensure effective utilisation of fixed facilities and for maintaining the circulation of current assets. There is always a minimum level of current assets which is continuously required by the enterprise to carry out its normal business operations. For example, every firm has to maintain a minimum level of raw materials, work-in-process, finished goods and cash balance. This minimum level of current assets is called permanent or fixed working capital as this part of capital is permanently blocked in current assets.

2. Temporary or Variable Working Capital: Temporary or variable working capital is the amount of working capital which is required to meet the *seasonal demands and some special exigencies. Variable working capital can be further classified as seasonal working capital and special working capital.* Most of the enterprises have to provide additional working capital to meet the seasonal and special needs. The capital required to meet the seasonal needs of the enterprise is called *seasonal working* capital. Special working capital is that part of working capital which is required to meet special exigencies such as launching of extensive marketing campaigns for conducting research, etc.

IMPORTANCE (ADVANTAGES) OF ADEQUATE WORKING CAPITAL

No business can run successfully without an adequate amount of working capital. The main advantages of maintaining adequate amount of working capital are as follows:

1. **Solvency of the business:** Adequate working capital helps in maintaining solvency of the business by providing uninterrupted flow of production.

2. **Goodwill:** Sufficient working capital enables a business concern to make prompt payments and hence helps in creating and maintaining goodwill.

3. **Easy loans:** A concern having adequate working capital, high solvency and good credit standing can arrange loans from banks and others on easy and favourable terms.

4. **Cash discounts:** Adequate working capital also enables a concern to avail cash discount on the purchases and hence it reduces costs.

5. **Regular supply of raw materials:** Sufficient working capital ensure regular supply of raw materials and continuous production.

6. **Regular payment of salaries, wages and other day-to-day commitments:** A company which has ample working capital can make regular payment of salaries, wages and other day-to-day commitments which raises the morale of its employees, increases their efficiency, reduces wastages and costs and enhances production and profits.

7. **Exploitation of favourable market conditions:** Only concerns with adequate working capital can exploit favourable market conditions such as purchasing its requirements in bulk when the prices are lower and by holding its inventories for higher prices.

8. **Ability to face crisis:** Adequate working capital enables a concern to face business crisis in emergencies such as depression because during such periods, generally, there is much pressure on working capital.

9. **Quick and regular return on investments:** Every Investor wants a quick and regular return on his investments. Sufficiency of working capital enables a concern to pay quick and regular dividends to its investors.

FACTORS DETERMINING THE WORKING CAPITAL REQUIREMENTS

The working capital requirements of a concern depend upon a large number of factors such as nature and size of business, the character of their operations, the length of production cycles, the rate of stock turnover and the state of economic situation. It is not possible to rank them because all such factors are of different importance and the influence of individual factors changes for a firm over time.

However, the following are important factors generally influencing the working capital requirements.

1. Nature or Character of Business: The working capital requirements of a firm basically depend upon the nature of its business. Public utility undertakings like Electricity, Water Supply and Railways and very limited working capital because they offer cash sales only and supply services, not products, and as such no funds are tied up in inventories and receivables. On the other hand trading and financial firms require less investment in fixed assets but have to invest large amounts in current assets like inventories, receivables and cash; as such they need large amount of working capital.

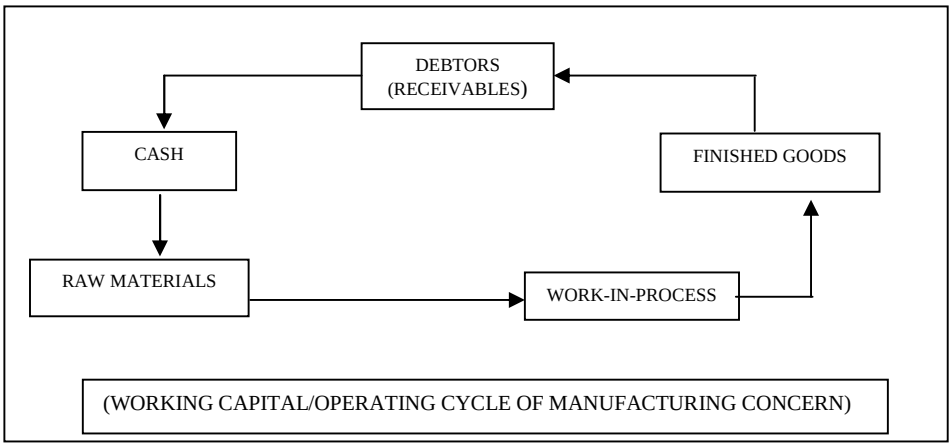
2. Size of Business/Scale of Operations: The working capital requirements of a concern are directly influenced by the size of its business which may be measured in terms of scale of operations. Greater the size of a business unit, generally larger will be the requirements of working capital.

3. Production Policy: In certain industries the demand is subject to wide fluctuations due to seasonal variations. The requirements of working capital, in such cases, depend upon the production policy.

4. Manufacturing Process/Length of Production Cycle: In manufacturing business, the requirements of working capital increase in direct proportion of length of manufacturing process. Longer the process period of manufacture, larger is the amount of working capital required.

5. Seasonal Variations: In certain industries raw material is not available throughout the year. They have buy raw materials in bulk during the season to ensure an uninterrupted flow and process them during the entire year.

6. Working Capital Cycle: In a manufacturing concern, the working capital cycle starts with the purchase of raw material and ends with the realisation of cash from the sale of finished products.



The speed with which the working capital completes one cycle determines the requirements of working capital-longer the period of the cycle larger are the requirement of working capital.

7. Rate of Stock Turnover: There is a high degree of inverse co-relationship between the quantum of working capital and the velocity or speed with which the sales are effected. A firm having a high rate of stock turnover will need lower amount of working capital as compared to a firm having a low rate of turnover.

8. Credit Policy: The credit policy of a concern in its dealings with debtors and creditors influence considerably the requirements of working capital. A concern that purchases its requirements on credit and sells its products/services on cash requires lesser amount of working capital.

9. Business Cycles: Business cycle refers to alternate expansion and contraction in general business activity. In period of boom i.e., when the business is prosperous, there is a need for larger amount of working capital due to increase in sales, rise in prices, optimistic expansion of business, etc).

10. Rate of Growth of Business: The working capital requirements of a concern increase with the growth and expansion of its business activities.

11. Earning Capacity and Dividend Policy: Some firms have more earning capacity than others due to quality of their products, monopoly conditions, etc. Such firms with high earning capacity may generate cash profits from operations and contribute to their working capital. The dividend policy of a concern also influences the requirements of its working capital.

12. Price Level Changes: Changes in the price level also affect the working capital requirements. Generally, the rising prices will require the firm to maintain larger amount of working capital as more funds will be required to maintain the same current assets.

13. Other Factors: Certain other factors such as operating efficiency, management ability, irregularities of supply, import policy, asset structure, importance of labour, banking facilities etc., also influence the requirements of working capital.

UNIT – 4

WORKING CAPITAL MANAGEMENT – PART - 11

Learning Objectives:

Methods of estimating working capital requirements.

- Mathematical and simulation models of working capital decisions
- Percentage of sales method, regression analysis method, cash forecasting method, operating cycle method and projected balance sheet method.

INTRODUCTION

Working capital, in general practice, refers to the excess of current assets over current liabilities. The basic goal of working capital management is to manage the current assets and current liabilities of a firm in such a way that a satisfactory level of working capital is maintained, i.e., it is neither inadequate nor excessive. This is so because both inadequate as well as excessive working capital positions are bad for any business. Inadequacy of working capital may lead the firm to insolvency and excessive working capital implies idle funds which earn no profits for the business. Working capital management policies of a firm have a great effect on its profitability, liquidity and structural health of the organisation.

Working capital management should be considered as an integral part of overall corporate management. In the words of *Louis Brand*, "We need to know when to look for working capital funds, how to use them and how to measure, plan and control them". To achieve the objectives of working capital management, the financial manager has to perform the following basic functions:

1. Estimating the working capital requirements.
2. Financing of working capital needs.
3. Analysis and control of working capital.

ESTIMATE OF WORKING CAPITAL REQUIREMENTS

"Working capital is the life-blood and controlling nerve centre of a business." No business can be successfully run without an adequate amount of working capital. To avoid the shortage of working capital at once, an estimate of working capital requirements should be made in advance so that arrangements can be made to procure adequate working capital.

Now, let us see what the methods of estimating working capital requirements are.

Methods of Estimating Working Capital Requirements

1. Percentage of Sales Method

2. Regression Analysis Method (Average Relationship between Sales and Working Capital).
3. Cash Forecasting Method
4. Operating Cycle Method
5. Projected Balance Sheet Method

1. Percentage of Sales Method

This method of estimating working capital requirements is based on the assumption that the level of working capital for any firm is directly related to its sales value. Thus, if sales for the year 2015 amounted to Rs 30,00,000 and working capital required was Rs 6,00,000; the requirement of working capital for the year 2008 on an estimated sales of Rs 40,00,000 shall be Rs 8,00,000 *.i.e*, 20% of Rs 40,00,000. The individual items of current assets and current liabilities can also be estimated on the basis of the past experience as a percentage of sales.

Problem 1. The following information has been provided by a company for the year ended 30.3.2015:

Liabilities	**Rs**	**Assets**	**Rs**
Equity share capital	2,00,000	Fixed assets less depreciation	3,00,000
8% Debentures	1,00,000	Inventories	1,00,000
Reserves and surplus	50,000	Sundry debtors	70,000
Long-term loans	50,000	Cash and bank	10,000
Sundry creditors	80,000		
	4,80,000		4,80,000

Sales for the year ended 31.3.2015 amounted to Rs 10,00,000 and it is estimated that the same will amount to Rs 12,00,000 for the year 2015-16.

You are required to estimate the working capital requirements for the year 2015-16 assuming a linear relationship between sales and working capital

Solution:

Estimation of Working Capital Requirements			
	Actual 31-03-15 (Rs)	**Percentage to Sales 31-03-15 (**Rs)	**Estimate 2015-16 (**Rs)
Sales	10,00,000	100	12,00,000
Current Assets:			
Inventories	1,00,000	10	1,20,000
Sundry debtors	70,000	7	84,000
Cash and bank	10,000	1	12,000
Total Current Asset (CA)	1,80,000	18	2,16,000
Current Liabilities:			
Sundry creditors	80,000	8	96,000
Total Current Liabilities (CL)	80,000	8	96,000
Working Capital (CA - CL)	1,00,000	10	1,20,000

2. Regression Analysis Method (Average Relationship between Sales and Working Capital)

This method of forecasting working capital requirements is based upon the statistical technique of estimating or predicting the unknown value of a dependent variable from the known value of an independent variable. It is the measure of the average relationship between two or more variables, *i.e*., sales and working capital, in terms of the original units of the data.

The relationship between sales and working capital is represented by the equation:

$$y = a + bx$$

Where, y = Working capital (dependent variable)
a = Intercept of the least square
b = Slope of the regression line
x = Sales (independent variable)

For determining the values 'a' and 'b' two normal equations are used which can be solved simultaneously:

$$\sum y = na + b\sum x$$
$$\sum xy = a\sum x + b\sum x^2$$

Problem 2: The sales and working capital figures of Suvidha Ltd. for a period of 5 years are given as follows:

Year	**Sales (Rs lakhs)**	**Working Capital (Rs lakhs)**
2010-11	60	12
2011-12	80	15
2012-13	120	20
2013-14	130	21
2014-15	160	23

You are required to forecast the working capital requirements of the company for the year 2015-16 taking the estimated sales of Rs 200lakhs.

Solution:

The relationship between sales and working capital can be represented by:
$y = a + bx$

Year	**Sales (x)**	**Working Capital (y)**	**xy**	**x^2**
2010-11	60	12	720	3,600
2011-12	80	15	1,200	6,400
2012-13	120	20	2,400	14,400
2013-14	130	21	2,730	16,900
2014-15	160	23	3,680	25,600
n = 5	$\sum x = 550$	$\sum y = 91$	$\sum xy = 10,730$	$\sum x^2 = 66,900$

$$\sum y = na + b \sum x$$

$$\sum xy = a \sum x + \sum x^2$$

Putting the values in the above equations:

$$91 = 5a + 550\ b \quad \text{..... (i)}$$

$$10,730 = 550a + 66,900\ b \quad \text{..... (ii)}$$

Multiplying equation (i) with 110, we get:

$$10010 = 550a + 60,500\ b \quad \text{..... (iii)}$$

Subtracting equation (iii) equation (ii)

$$720 = 0 + 6400\ b$$

$$b = 0.1125$$

Putting the value of b in equation (i)

$$91 = 5a + 550 \times 0.1125$$

91	=	5a	+	61.875
5a		=		29.125
	a	=		5.825

Now, putting the values of a and b in the equation y = a + bx : (Where y and x are estimated working capital and estimated sales respectively)

y	=	5.825	+	0.1125	x	200
y		=				27.825

Thus when estimated sales for 15-16 are Rs 200 lakhs, the amount of estimated working capital shall be Rs 27.825 lakhs.

3. Cash Forecasting Method

This method of estimating working capital requirements involves forecasting of cash receipts and disbursements during a future period of time. Cash forecast will include all possible sources from which cash will be received and the channels in which payments are to be made so that a consolidated cash position is determined. This method is similar to the preparation of a cash budget. The excess of receipts over payments represents surplus of cash and the excess of payments over receipts causes deficit of cash or the amount of working capital required. The following illustration explains the cash forecasting method of estimating working capital requirements.

Problem 3: Texas Manufacturing Company Ltd. is to start production on 1st January, 2009. The prime cost of a unit is expected to be Rs 40 out of which Rs 16 is for materials and Rs 24 for labour. In addition, variable expenses per unit are expected to be Rs 8 and fixed expenses per month Rs 30,000. Payment for materials is to be made in the month following the purchases. One-third of sales will be for cash and the rest on credit for settlement in the following month. Express are payable in the month in which they are incurred. The selling price is fixed at Rs 80 per unit. The number of units manufactured and sold is expected to be as under:

January	900
February	1,200
March	1,800
April	2,100
May	2100
June	2,400

Draw up statement showing requirements of working capital from month to month, ignoring the question of stocks.

Solution :

Statement Showing requirement of Working Capital						
	January Rs	**February Rs**	**March Rs**	**April Rs**	**May Rs**	**June Rs**
Payments:						
Materials	-	14,400	19,200	28,800	33,600	33,600
Wages	21,600	28,800	43,200	5,400	50,400	57,600
Fixed Expenses	30,000	30,000	30,000	30,000	30,000	30,000
Various Expenses	7,200	9,600	14,400	16,800	16,800	19,200
	58,800	82,800	1,06,800	1,26,000	1,30,800	1,40,400
Receipts:						
Cash Sales	24,000	32,000	48,000	56,000	56,000	64,000
Debtors	-	48,000	64,000	96,000	1,12,000	1,12,000
	24,000	80,000	1,12,000	1,52,000	1,68,000	1,76,000
Working Capital Required (Payments-Receipts)	34,800	2,800	-	-	-	-
Surplus	-	-	5,200	26,000	37,200	35,600
Cumulative Requirements of Working Capital:	34,800	37,600	32,400	6,400	-	-

Surplus Working Capital	-	-	-	-	30,800	66,400

Working Notes:

(i) As payment for material is made in the month following the purchase, there is no payment for material in January. In February, material payment is calculated as 900 x 16= Rs 14,400 and in the same manner for other months.

(ii) Cash sales are calculated as: For January $900 \times 80 \times \frac{1}{3}$ = Rs 24,000 and in the same manner for other months.

(iii) Receipts from debtors are calculated as:

For Jan. – Nil, because cash from debtors is collected in the month following the sales.

For Feb. - = $900 \times 80 \times \frac{2}{3}$ = Rs 48,000

For March - $1200 \times 80 \times \frac{2}{3}$ = Rs 64,000 and so on.

4. Operating Cycle Method

This method of estimating working capital requirements is based upon the operating cycle concept of working capital, We have discussed earlier, in this chapter, the concept and determination of duration of operating cycle. The cycle starts with the purchase of raw material and other resources and ends with the realisation of cash from the sale of finished goods. It involves purchase of raw materials and stores, its conversion into stock of finished goods through work-in-process with progressive increment of labour and service costs, conversion of finished stock into sales, debtors and receivables, realisation of cash and this cycle continues again from cash to purchase of raw material and so on. The speed/time duration required to complete one cycle determines the requirement of working capital - linger the period of cycle, larger is the requirement of working capital and vice-versa. The requirements of working capital be estimated as follows:

Working Capital Required

$$= \text{Cost of goods sold} \times \frac{\text{Operting cycle (days)}}{365 \text{ or } 360 \text{ days}} + \text{Desired cash balance}$$

Problem 4. Details of X Ltd. for the year 2007- 08, are given as under:

Cost of goods sold	Rs 48,00,000
Operating cycle	60 days
Minimum desired level of cash balance	Rs 75,000

You are required to calculate the expected working capital requirement by assuming 360 days in a year.

Solution :

Expected Working Capital requirement

$$= \text{Cost of goods sold} \times \frac{\text{Operating cycle (days)}}{365 \text{ or } 360 \text{ days}} + \text{Desired cash balance}$$

$$= 48,00,000 \times \frac{60}{360} + 75,000$$

$$= \text{Rs } 8,75,000$$

For proper computation of working capital under this method, a detailed analysis is made for each individual component of working capital. The value of each individual item of current assets and current liabilities is determined on the basis on the basis of estimated sales or budgeted production or activity levels as follows:

(a) Stock of Raw Materials. The amount of working capital finds to be invested in holding stock of raw material can be estimated on the basis of budgeted units of production, estimated cost of raw material per unit and the average duration for which the raw material is held in stock by using the following formula:

$$\text{Budgeted annual units of production} \times \text{Estimated cost of raw material per unit} \times \frac{\text{Average raw material holding period in days/months/weeks}}{\text{No.of days/months/weeks in year}}$$

(Notes: 360 days in a year may be assumed in place of 365 to simplify calculations in some cases).

(b) Stock of Work-in-Process. In manufacturing/processing industries the production is carried on continuous basis. At the end of the period, some work remains incomplete even though all or some expenses have been incurred, this work is known as work-in-progress or partly completed or semi-finished goods. The work-in-process consists of direct material, direct labour and production overheads locked up in this semi finished goods.

Budgeted annual units of production

$$\times \text{Estimated cost of WIP per unit} \times \frac{\text{Average WIP holding period in day/months/weeks}}{\text{No.of days/months/weeks in year}}$$

Note: (i) 360 days a year may be assumed to simplify calculations.

(ii) In the absence of information about stage of completion of WIP with regard to material, labour and overheads, 100% of materials cost, and 50% of labour and production overheads cost may be assumed as the estimated cost of work-in-process

(iii) **In case cash cost approach** is followed for estimation of working capital, then depreciation should be excluded from production overheads while calculating cost of work-in-process. However, under the total approach, depreciation is also included.

(c) Stock of Finished Goods. The amount of funds to be invested in holding stock of finished goods can be estimated on the basis of annual budgeted units of production, estimated cost of production per unit and the average holding period of finished goods stock by using the following formula:

$$\text{Budgeted annual units of production} \times \text{Estimated cost of production per unit} \times \frac{\text{Average holding period of finished goods in day/months/weeks}}{\text{No.of days/months/weeks in year}}$$

(d) Investment in Debtors/Receivables. When the sales are made by a firm on cash basis, the amount is realised immediately and no funds are blocked for after sale period. However, in case of credit sales, there is a time lag between sales and realisation of cash. Thus, funds are to be invested in receivables, i.e. debtors and bills receivables. However, actual amount of funds locked up in receivables is only to the extent of cost of sales and not the actual sales which include profit. It would, therefore, be more appropriate to ascertain the amount of funds to be invested in debtors/receivables at cost of sales and not the selling price. But in case, total approach is followed for estimation of working capital then receivables may be computed on the basis of selling price.

$$\text{Budgeted units of credit sales} \times \text{cost of sales per unit} \times \frac{\text{Average collection period of recievables in day/months/weeks}}{\text{No.of days/months/weeks in year}}$$

Note (i) Cost of sales = Cost of goods produced/sold + Office and administrative overheads+ selling and distribution overheads

(ii) Selling price per unit should be considered in place of cost of sales per unit in case total approach is to be followed for estimate of working capital. Under the total approach, all costs including depreciation and profit margin are included.

(e) Cash and Bank Balance. Cash is one of the current assets of a business. It is needed at all times to keep the business going. A business firm has to always keep sufficient cash to meet its obligations. Thus, a minimum desired cash and bank balance to be maintained by a firm should be considered as an important component of current assets while estimating the working capital requirements.

(f) Prepaid Expenses. Some of the expenses like wages, manufacturing overheads, office and administrative expenses and selling and distribution expenses etc. may have to be paid in advance. Such prepayment of expenses should also be estimated while computing working capital requirements of a firm.

(g) Trade Creditors. The term trade creditors refer to the creditors for purchase of raw material, consumable stores etc. The suppliers of goods, generally, extend some period of credit in the normal course of business. The trade credit arrangement of a firm with its suppliers is an important source of short-term finance. It reduces the amount of net working capital required by a firm. The amount of funds to be provided by creditors can be estimated as follows:

$$\frac{\text{Budgeted units of Production} \times \text{Estimated raw material cost per unit} \times \text{Average payment period of creditors in day/months/weeks}}{\text{No.of days/months/weeks in year}}$$

(h) Creditors for Wages and Other Expenses. Wages and salaries are usually paid on monthly, fortnightly nor weekly basis for the services already rendered by employees. The longer the payment - period, the greater is the amount of current liability towards employees or the funds provided by them. In the same manner, other expenses may also have to be paid after the lag of a certain period. The amount of such accrued or outstanding expenses reduces the level of net working capital requirements of a firm. The creditors for wages and other overheads may be computed as follows:

$$\text{Budgeted annual production in units} \times \text{Estimated labour/overheads cost per unit} \times \frac{\text{Average time lag in payment of wages/overheads in days/months/weeks}}{\text{No. of days/months/weeks in year}}$$

Note .(i) The creditors for wages and each of the overheads may be calculated separately.

(ii) In case of selling overheads, budgeted annual sales in units should be considered in place of budgeted production units.

(i) Advances Received. Sometimes a payment may be received in advance along with purchase order; such advances reduce the amount of net working capital required by a firm.

Factors Requiring Consideration While Estimating Working Capital

The estimation of working capital requirement is not an easy task and a large number of factors have to be considered before starting this exercise. For a manufacturing organisation, the following factors have to be taken into consideration while making an estimate of working capital requirements:

Factors Requiring Consideration While Estimating Working Capital	
1.	Total costs incurred on material, wages and overheads.
2.	The length of time for which raw materials are to remain in stores before they are issued for production.
3.	The length of the production cycle or work-in-process, i.e., the time taken for conversion of raw material into finished goods.
4.	The length of sales cycle during which finished goods are to be kept waiting for sales.
5.	The average period of credit allowed to customers.
6.	The amount of cash required to pay day-to-day expenses of the business.
7.	The average amount of cash required to make advance payments, if any,
8.	The average credit period expected to be allowed by suppliers.
9.	Time-lag in the payment of wages and other expenses.
10.	The average amount of advances received, if any

From the total amount blocked in current assets estimated on the basis of the first seven items given above, the total of the current liabilities, i.e., the last three items, is deducted to find out the requirements of working capital.

In case of purely trading concerns, points 1, 2 and 3 would not arise but all other factors from points 4 to 10 are to be taken into consideration.

In order to provide for contingencies, some extra amount generally calculated as a fixed percentage of the working capital may be added as a margin of safety.

5. Projected Balance Sheet Method

Under this method, projected balance sheet for future date is prepared by forecasting of assets and liabilities by following any of the methods stated above. The excess of estimated total current assets over estimated current liabilities, as shown in the projected balance sheet, is computed to indicate the estimated amount of working capital required.

Problem 5. Prepare an estimate of working capital requirement from the following information of a trading concern:

(a)	Projected annual sales	1,00,000 units
(b)	Selling price	Rs 8 per unit
(c)	% age of net profit on sales	25%
(d)	Average credit period allowed to customers	8 weeks
(e)	Average credit period allowed by suppliers	4 weeks
(f)	Average stock holding in terms of sales requirements	12 weeks
(g)	Allow 10% for contingencies	

Solution:

Statement of Working Capital Requirements	
	Rs
Current Assets	
Debtors (8 weeks):6,00,000x8/52 (At Cost)	92,308
Stock (12 weeks): 6,00,000 x 12/52	1,38,462
	2,30,770
Less: Current Liabilities:	
Creditors (4 weeks): 6,00,000 x 4/52	46,154
Net working capital	1,84,616
Add 10% for contingencies	18,462
Working Capital Required	2,03,078

Working Notes:

(a) Sales = 1,00,000 x 8 = Rs 8,00,000

Profit = 25% of Rs 8,00,000 = Rs 2,00,000

Cost of Sales = Rs 6,00,000

(b) As, it is a trading concern, cost of sales, are assumed to be the purchases.

(c) Profits have been ignored as funds provided by profits may or may not be used as working capital.

Problem 6: X & Co. is desirous to purchase a business and has consulted you and one point on which you are asked to advise them is the average amount of working capital which will be required in the first year's working.

You are given the following estimates and are instructed to add 10% to your computed figure to allow for contingencies:

		Figures for the year Rs
(i)	Amount blocked up for stocks:	
	Stocks of finished product	5,000
	Stocks of stores, materials, etc	8,000
(ii)	Average credit given:	
	Inland Sales-6 weeks credit	3,12,000
	Export Sales 1 ½ weeks credit	78,000
(iii)	Lag in payment of wages and other outgoing :	
	Wages - 1 ½ Weeks	2,60,000
	Stocks of materials etc, 1 ½ months	48,000
	Rent, Royalties etc 6 months	10,000
	Clerical staff = ½ month	62,400
	Manager ½ month	4,800
	Miscellaneous Expenses 1 ½ months	48,000
(iv)	Payment in Advance:	
	Sundry Expenses (paid Quarterly in advance)	8,000
(v)	Undrawn profit on the average throughout the year	11,000

Set up your calculations for the average amount of working capital required.

Solution:

Statement Showing the Calculation of Average Working Capital Required

Current Assets		**Rs**	**Rs**
(i)	Stock of finished products		5,000
(ii)	Stocks of stores material, etc		8,000
(iii)	Sundry debtors		
	(a) Inland (6weeks) 3,12, 000 x $\frac{6}{52}$	36,000	
	(b) Export sales (1½ weeks) 78,000x $\frac{3}{52}\times\frac{1}{2}$	2,250	38,250
(iv)	Payments in advance 8,000 x $\frac{1}{4}$		2,000
			53,250
	Less: Current Liabilities :		
	Lag in payment of :		
	Wages (1½ weeks) 2,60,000 x $\frac{3}{52}\times\frac{1}{2}$	7,500	
	Stocks, materials, etc (1½ months) $\frac{48,000}{12}\times\frac{3}{2}$	6,000	
	Rent, royalties, etc, (6 months) 10,000x $\frac{6}{12}$	5,000	
	Clerical staff (½ month) $\frac{62,400}{12}\times\frac{1}{2}$	2,600	
	Manager (½ month) $\frac{4,800}{12}\times\frac{1}{2}$	200	
	Miscellaneous expenses (1 ½ months) $\frac{48,00}{12}\times\frac{3}{2}$	6,000	27,300
	Net Working Capital		25,950
	Add 10% Margin for Contingencies		2,595
	Average amount of working capital required		28,545

Note: Undrawn Profits have been ignored for the following reasons:

(i) Profits may or may not be used as working capital.

(ii) Even if it is to be used for working capital, it should be reduced by the amount of income-tax, drawings, dividend paid etc.

Problem **7:** From the information given below you are required to prepare a projected Balance Sheet, Profit and Loss Account and then an estimate of working capital requirements:

		Rs
(a)	Issued share capital	3,00,000
	6% debentures	2,00,000
	Fixed assets at cost	2,00,000
(b)	The expected rations to selling price are:	
	Raw Materials	50%
	Labour	20%
	Overheads	20%
	Profit	10%
(c)	Raw materials are kept in store for an average of two months	
(d)	Finished goods remain in stock for an average period of three months	
(e)	Production during the previous year was 1,80,000 units and it is planned to maintain the same in the current year also	
(f)	Each unit of production is expected to be in process for half a month	
(g)	Credit allowed to customers is three months and given by suppliers is two months	
(h)	Selling price is Rs 4 per unit	
(i)	There is a regular production and sales cycle	
(j)	Calculation of debtors may be made at selling price	

Solution

			Rs
1	Calculation of sales:		
	Total sales	=1,80,000x4	7,20,000
2.	Calculation of amount blocked in inventories:		
	(a) Stock of Raw Material	$=\frac{7,20,000\times50\times2}{100\times12}$	60,000
	(b) Stock of Finished Goods at Cost		1,62,000

	(Material+Labour+Overheads)	$=\frac{7,20,000\times 90\times 3}{100\times 12}$	
(c)	Work-in-process at Cost:		
	Raw Material	=7,20,000 x $\frac{50}{100}\times\frac{1}{24}=15,000$	
	Labour	=7,20,000 x $\frac{20}{100}\times\frac{1}{24}=\frac{50}{100}=3,000$	
	Overheads	=7,20,000 x $\frac{20}{100}\times\frac{1}{24}=\frac{50}{100}=3,000$	21,000
3.	Calculation of amount locked up in debtors:		
	Total Sales	=1,80,000x4	
	Debtors (at selling price, as given)	7,20,000x$\frac{3}{12}$	1,80,000
4.	Calculations of creditors: (for raw materials)		
	Total Purchases	=7,20,000 x$\frac{50}{100}$=3,60,000	
	Creditors	=3,60,000x$\frac{2}{12}$	60,000

Projected Profit and Loss Account

	Rs		Rs
To cost of goods sold:		By Sales	7,20,000
To Raw Materials	3,60,000		
To Labour	1,44,000		
To Overheads	1,44,000		
To Gross Profit	72,00		
	7,20,000		7,20,000
To interest on Debentures	12,000	By Gross Profit	72,00
To Net Profit	60,000		
	72,000		72,00

	==		--- 72,000 ========

Projected Balance Sheet				
Liabilities	Rs.	*Assets*		Rs.
Share Capital	3,00,000	Fixed Assets (at cost)		2,00,000
6% Debentures	2,00,000	Current Assets:		
Profit and Loss Account	60,000	Stocks:	60,000	
Creditors	60,000	Work -in-process	21,000	
Bank overdraft (balancing figure)	3,000	Finished Goods	1,62,000	4,23,000
	---------	Debtors	1,80,000	-------
	6,23,000		----------	6,23,000
	=======			=======

Working Capital = Current Assets -Current Liabilities

Current Assets = Rs. 4,23,000

Current Liabilities = Sundry Creditors (Rs. 60,000) + Bank Overdraft (Rs. 3,000) = Rs. 63,000

So, Working Capital = Rs. 4, 23, 000-63,000 = Rs. 3,60,000

Problem: 8, Raju Brothers Private Limited sells goods on a gross profit of 25%. Depreciation is taken into account as a part of cost of production. The following are the annual figures given to you:

	Rs
Sales (two months' credit)	18,00,000
Material consumed (one month credit)	4,50,000
Wages (one month lag in payment)	3,60,00
Cash manufacturing expenses (one month lag in payment)	4,80,000
Administration expenses (one month lag in payment)	1,20,000
Sales promotion expenses (paid quarterly in advance)	60,000
Income-tax payable in 4 installments of which one lies in next year	1,50,000

The company keeps one month's stock each of raw material and finished goods. It also keeps Rs. 1,00,000 in cash. You are required to estimate the working capital requirements of the company on cash cost basis assuming 15% safety margin. Ignore work-in-progress.

Solution

Current Assets:	**Rs**	**Rs**
Stock of raw material (4,50,000x $\frac{1}{12}$)		37,500
Stock of finished goods at cash manufacturing cost (12,90,000 x $\frac{1}{12}$) [Working Note 2]		1,07,500
Debtors at cash cost of sales (14,70,000 x$\frac{1}{12}$) [Working Note 3]		2,45,000
Advance payment of sales promotion expenses (60,000 x $\frac{1}{4}$)		15,000
Cash		1,00,000
		5,05,000
Less: Current Liabilities:		

Creditors for purchase of material ($4,50,000 \times \frac{1}{12}$)	37,500	
Wages outstanding ($3,60,000 \times \frac{1}{12}$)	30,000	
Cash manufacturing expenses outstanding ($4,80,000 \times \frac{1}{12}$)	40,000	
Administration expenses outstanding ($1,20,000 \times \frac{1}{12}$)	10,000	1,75,500
Net working capital		3,87,500
Add:15% safety margin		58,125
Working Capital Required		4,45,625

Problem 9: A company newly commencing business in 2011 has the under mentioned projected profit and loss account

	Rs	Rs
Sales		42,00,000
Cost of goods sold		30,60,000
Gross profit		11,40,000
Administrative expense	2,80,000	
Selling expenses	2,60,000	5,40,000
Profit before tax		6,00,000
Provision for taxation		2,00,000
profit after tax		4,00,000
the cost of goods sold has been arrived at as under:-		
Materials used		16,80,000

Wages and manufacturing expenses	12,50,000
Depreciation	4,70,000

	34,00,000
Less: Stock of finished goods (10% of goods produced not yet sold)	3,40,000

	30,60,000

The figures given above relate only to finished goods and to work in progress. Goods equal to 15% of the year's production (in terms of physical units) will be in process on the average requiring full materials but only 40% of the other expenses. The company believes in keeping material equal to two months consumption in stock)

All expenses will be paid one month in arrear; Suppliers of material will extend

1 ½ month credit; sales will be 20% for cash and the rest at two months credit; 90% of the income tax will be paid in advance in quarterly installments: The company wishes to keep Rs 1,00,000 in cash.

Prepare an estimate of the requirements of (i) working capital (total basis) and (ii) cash cost of working capital

Solution:

Estimate of the Requirements of working capital (Total Approach)		
	Rs	Rs
Currents Assets:		
1. Stock of Finished Goods (10% of goods produced):		
Raw Materials 16,80,00x10/100	1,68,000	
Wages and Manufacturing Expenses 12,50,000x10/100	1,25,000	3,40,000
Depreciation 4,70,000x10/100	47,000	
2. Work-in-process (15% of the production):		

	Raw Material 16,80,000x15/100	2,52,000	
	Wages and Manufacturing Expenses 12,50,000x $\frac{15}{100}\times\frac{40}{100}$	75,000	
	Depreciation 4,70,000x $\frac{15}{100}\times\frac{40}{100}$	28,200	3,55,200
3.	Stock of Raw Material (2 months):		
	For Finished goods 16,80,000		
	For work-in-process 2,52,000		
	19,32,000 19,32,000 x 2/12		
4.	Sundry Debtors (80% of 2 months sales)		
	42,00,000x 2/12 x 80/100 = 5,60,000		
	Components of Debtors:		
	Material 16,80,000 x 90/100 x 2/12 x 80/100	2,01,600	
	Wages & Manufacturing expenses 12,50,000 x $\frac{90}{100}\times\frac{2}{12}\times\frac{80}{100}$	1,50,000	
	Depreciation 4,70,000 x $\frac{90}{100}\times\frac{2}{12}\times\frac{80}{100}$	56,400	
	(as 10% of goods produced are not yet sold material, wages and manufacturing expenses have been taken at 90%)		
	Adm. and Selling Expenses 5,40,000 x $\frac{2}{12}\times\frac{80}{100}$	72,000	
	Profit 6,00,000 x $\frac{2}{12}\times\frac{80}{100}$	80,000	5,60,000
5.	Cash in hand (given)		1,00,000
	Total Current assets (a)		16,77,200
Current Liabilities:			
1.	Creditors for Raw Material (3/2 months):		
	For Finished goods 16,80,000		

	For W.I.P	2,52,000	
	For Stock of Raw Material	3,22,000	2,81,750
		22,54,000 x 3/24	
2	Creditors for Wages and Manufacturing Expenses		
.			
	For Finished Goods	12,50,000	
	For W.I.P.	75,000	
		13,25,000 x 1/12	1,10,416
3	Creditors for Administrative & Selling exp. 5,40,000 x1/12		45,000
.			
4	Taxes payable (10% provision for tax as 90% is only paid) 2,00,000x 10/100		20,000
	Total Current Liabilities (b)		4,57,166
	Working Capital Required (a-b)		12,20,034

***ii)* Estimate of the Requirement of Cash Cost of Working Capital)**

		Rs
	Estimated Working Capital Requirements as in (i) above	12,20,034
	Less: Cash not required for depreciation and profit	Rs
	Depreciation in stock of finished goods	47,000
	Depreciation in debtors	28,200
	Depreciation in debtors	56,400
	Profit included in debtors	80,000 2,11,600
	Cash Cost or Working Capital Requirements	10,08,434

FINANCING OF WORKING CAPITAL

The working capital requirements of a concern can be classified as:

(a) Permanent or Fixed working capital requirements

(b) Temporary or Variable working capital requirements

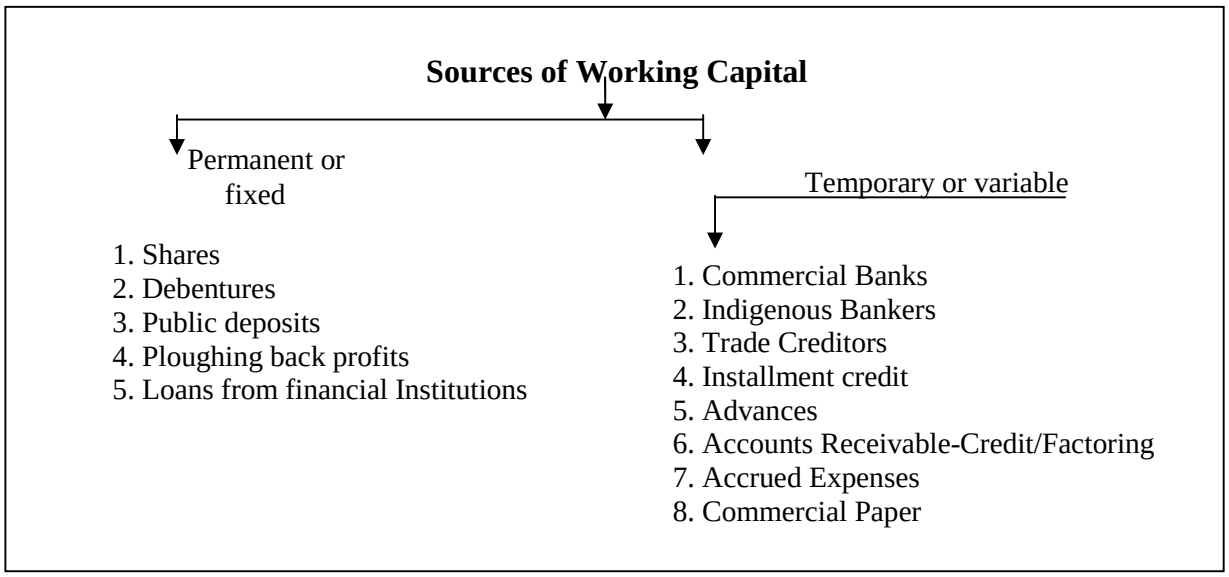
In any concern, a part of the working capital investments are as permanent investments in fixed assets. This is so because there is always a minimum level of

current assets which are continuously required by the enterprise to carry out its day-to-day business operations and this minimum cannot be expected to reduce at any time. This minimum level of current assets gives rise to permanent or fixed working capital as this part of working capital is permanently blocked in current assets.

Similarly, some amount of working capital may be required to meet the seasonal demands and some special exigencies such such as rise in prices, strikes, etc. this proportion of working capital gives rise to temporary or variable working capital which cannot be permanently employed gainfully in business.

The fixed proportion of working capital should be generally financed from the fixed capital sources while the temporary or variable working capital requirements of a concern may be met from the short term sources of capital.

The various sources for the financing of working capital are as follows:



FINANCING OF PERMANENT/FIXED OR LONG-TERM WORKING CAPITAL

Permanent working capital should be financed in such a manner that the enterprise may have its uninterrupted use for a sufficiently long period. There are five important sources of permanent or long-term working capital.

1. Shares: Issue of shares is the most important source for raising the permanent or long-term capital.

2. Debentures: A debenture is an instrument issued by the company acknowledging its debt to its holder. It is also an important method of raising long-term or permanent working capital.

3. Public Deposits: Public deposits are the fixed deposits accepted by a business enterprise directly from the public. This source of raising short term and medium-term finance was very popular in the absence of banking facilities.

4. Ploughing Back of profits: Ploughing back of profits means the reinvestments by a concern of its surplus earnings in its business. It is an internal source of finance and is most suitable for an established firm for its expansion, modernisation and replacement etc.

5. Loans from Financial Institutions: Financial institutions such as commercial Banks, Life Insurance corporation, Industrial Finance Corporation of India, State Financial Corporations, Sate Industrial Development Corporations, Industrial Development Bank of India, etc. also provide short-term, medium-term and long-term long.

FINANCING OF TEMPORARY, VARIABLE OR SHORT -TERM WORKING CAPITAL

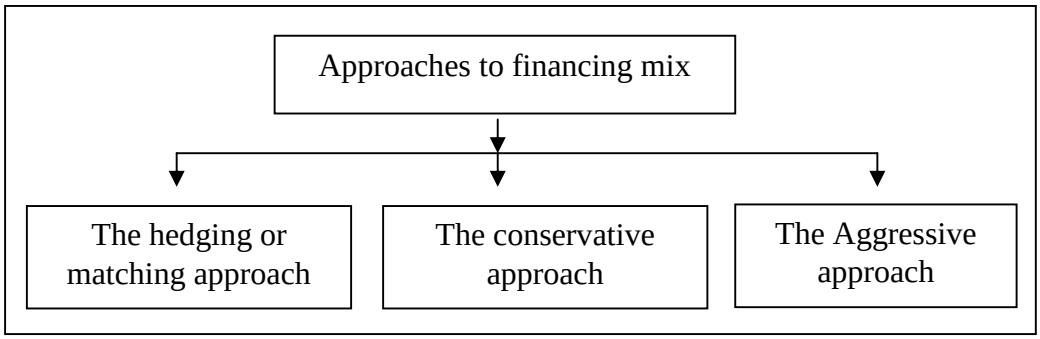
The main source of short-term working capital are as follows:

1. Indigenous Bankers
2. Trade Credit
3. Installment Credit
4. Advances
5. Accrued Expenses
6. Deferred Incomes
8. Commercial paper
9. Commercial Banks

DETERMINING THE WORKING CAPITAL FINANCING MIX

Broadly speaking there are two sources of financing working capital requirements: (*i*) Long-term sources, and (*ii*) short-term sources. Therefore, a question arises as to what portion of working capital (current assets) should be financed by long-term sources and how much by short-term sources?

There are three basic approaches for determining an appropriate working capital financing mix.



1. The Hedging or Matching Approach

The term 'hedging' usually refers to two off-selling transactions of a simultaneous but opposite nature which counter balance the effect of each other. With reference to financing mix, the term hedging refers to 'a process of matching maturities of debt with the maturities of financial needs'. This approach is also known as matching approach'. It classifies the requirements of total working capital into two categories:

(*i*) Permanent or fixed working capital which is the minimum amount required to carry out the normal business operations. It does not vary over time.

(*ii*) Temporary or seasonal working capital which is required to meet special exigencies. It fluctuates over time.

The hedging approach suggests that the permanent working capital requirements should be financed with funds from long-term sources while the temporary or seasonal working capital requirements should be financed with short-term funds.

2. The Conservative Approach

This approach suggests that the entire estimated investments in current assets should be financed from long-term sources and the short-term sources should be used only for emergency requirements.

3. The Aggressive Approach

The aggressive approach suggests that the entire estimated requirements of currents asset should be financed from short-term sources and even a part of fixed assets investments be financed from short-term sources. This approach makes the finance-mix more risky, less costly and more profitable.

ZERO WORKING CAPITAL APPROACH

We have discussed earlier that the net working capital of a firm may be positive or negative, *i.e* the total of current assets may exceed the total of current liabilities or vice-versa. However, in some cases, there may neither be any positive nor any negative working capital; the total of the current assets may just be equal to the total of current liabilities. Such a situation may be called as zero working capital situation.

Review Questions:

1. Define the term working capital. What factors would you take into consideration in estimating the working capital needs of a concern?

2. Describe the need and determinants of working capital in a business.

3. What factors would you take into consideration in estimating the working capital needs of a concern?

4. In managing working capital, the finance manager faces the problem of compromising the conflicting goals of liquidity and profitability. Comment what strategy should he develop to solve this problem.

EXERCISES

Ex. 1. Traders Ltd. are engaged in large-scale retail business. From the following information, you are required to forecast their working capital requirements:

Projected annual sales	Rs 130 lakhs
Percentage of net profit on cost of sales	25%
Average credit period allowed to debtors	8 weeks
Average credit period allowed by credits	4 weeks
Average stock carrying (in terms of sales requirements)	8 weeks
Add:10% to computed figures to allow contingencies	

[Ans: Rs 26.40 lakhs)

Ex. 4. The board of Directors of Nanak Engineering Company Private Ltd. requests you to prepare a statement showing the Working Capital Requirement for a level of activity of 1,56,000 units of production.

The following information is available for your calculations:

(*A*)	*Per unit* *Rs*
Raw Materials	90
Direct Labour	40
Overheads	75

	205
profit	60

Selling Price per unit	265
	====
(*B*) (*i*) Raw materials are in stock, on average one month (i*i*) Materials are in process, on average 2 weeks (*iii*) Finished goods are in stock, on average one month (*iv*) Credit allowed by suppliers, one month (*v*) Time lag in payment from debtors, 2 months (*vi*) Lag in payment of wages, 1 ½ weeks (*vii*) Lag in payment of overheads is one month	

20% of the output is sold against cash. Cash in hand and at bank is expected to be Rs 60,000. It is to be assumed that production is carried on evenly throughout the year, wages and overheads accrue similarly and a time period of 4 weeks is equivalent to a month.

[Ans: Working Capital Required = Rs 62,61,000]

[Note: As degree/stage of completion of work-in process is not given, it has been assumed to be 100% complete as regards material and 50% for labour and overheads. Further, it is stated that wages and overheads accrue evenly throughout the year].

Ex. 5. From the information given below you are required to prepare a projected Balance Sheet, Profit and Loss Account and then an estimate of working capital requirements:

		Rs
(a)	Issued Share Capital	2,00,000
	8% bonds	75,000
	Fixed Assets at Cost	2,00,000
(b)	The expected ratios of cost to selling price are:	
	Raw Materials	40%
	Labour	30%
	Overheads	20%
	Profit	10%
(c)	Raw materials are kept in store for an average of two months	
(d)	Finished goods remain in stock for an average period of one month	
(e)	Work-in-process (100% complete in regard to material and 50% for labour and overheads) will approximately be to half a month's production	
(f)	Credit allowed to customers is two months and given by suppliers is one month	
(g)	Production during the previous year was 40,000 units and it is planned to maintain the same in the current year also.	
(h)	Selling price is Rs 9 per unit.	
(i)	Calculation of debtors may be made at selling price.	

[Ans: N.P. Rs 30,000; total of B/S Rs 3,20,750; W.C. Rs 1,05,000]

[**Hint:** Working Capital has been calculated after preparing Projected Balance Sheet, *i.e.* Current Assets - Current liabilities].

Ex.6. The following information has been extracted from the cost sheet of a company:

	Rs *per Unit*
Raw materials	45
Direct labour	20
Overheads	40
Total	105
Profit	15
Selling Price	120

The following further information is available:

(1) Raw materials are in stock on an average two months.
(2) The material are in process on an average for 4 weeks. The degree of completion is 50% in all respects.
(3) Finished goods stock on an average is for one month.
(4) Time lag in payment of wages and overheads is $1\frac{1}{2}$ weeks
(5) Time lag in receipt of proceeds from debtors is 2 months.
(6) Credit allowed by suppliers is one month.
(7) 20% of the output is sold against cash
(8) The company expects to keep a cash balance of Rs 10,000
(9) Take 52 weeks per annum
(10) Calculation of debtors may be made at selling price.
(11) The company is poised for a manufacture of 14,400 units in the year

You are required to prepare a statement showing the working capital requirements of the company.

[**Ans:** Rs 4,53,631]

Ex. 7: Foods Ltd. is presently operating at 60% level producing 36,000 packets of snack foods and proposes to increase capacity utilisation in the coming year by 33 $\frac{1}{3}$% over the existing level of production.

The following data has been supplied:

(i) Unit cost structure of the product at current level:

	Rs
Raw materials	4
Wages	2
Overheads (Variable)	2
Fixed Overhead	1
Profit	3
Selling Price	12

(ii) Raw materials will remain in stores for 1 month before being issued for production. Material will remain in process for further 1 month. Suppliers grant 3 months credit to the company.

(iii) Finished goods remain in go down for 1 month

(iv) Debtors are allowed credit for 2 months

(v) Lag in wages and overhead payments is 1 month and these expenses accrue evenly throughout the production cycle.

(vi) No increase either in cost of inputs or selling price is envisaged.

(vii) Calculation of debtors may be made at selling price

Prepare a projected profitability statement and the working capital requirement at the new level, assuming that a minimum cash balance Rs 19,500 has to be maintained)

[**Ans:** Profit Rs 1,56,000; Working Capital Required Rs 1,25, 000]

[**Hints :**(1) Work-in process is assumed to be 50% complete as regards wages and overheads with full material consumption. As wages and overheads are given to accrue evenly throughout the production cycle, it is assumed that these will be in process for half a month on an average.

(2) It has been assumed that there will be no increase in the stock levels due to increase in capacity].

UNIT- 5

MANAGEMENT OF CASH AND MARKETABLE SECURITIES

Learning objectives

- Nature of cash
- Motives for holding cash
- Cash management
- Managing cash flows
- Determining optimum cash balance
- Cash management models
- Investment of surplus funds

In this unit we will focus on the necessity for managing cash and marketable securities. Cash being one of the important constituents of working capital, it is essential to have an efficient cash management system for the smooth conduct of the business.

INTRODUCTION

Cash is one of the current assets of a business. It is needed at all times to keep the business going. A business concern should always keep sufficient cash for meeting its obligations. Any shortage of cash will hamper the operations of a concern and any excess of it will be unproductive. It is in this context that cash management has assumed much importance.

Nature of Cash

Cash itself does not produce goods or services. It is used as a medium to acquire other assets. It is the other assets which are used in manufacturing goods or providing services. The idle cash can be deposited in bank to earn interest.

There remains a gap between cash inflows and cash outflows. Sometimes cash receipts are more than the payments or it may be vice-versa at another time.

Motives For Holding Cash

The firm's needs for cash may be attributed to the following needs: Transactions motive, Precautionary motive and Speculative move.

Transaction Motive

A firm needs cash for making transactions in the day to day operations. The cash is needed to make purchases, pay expenses, taxes, dividend etc. The cash need arise due to the fact that there is no complete synchronization between cash receipts and payments. Sometimes cash receipts exceed ash payments or vice-versa.

Precautionary Motive

A firm is required to keep cash for meeting various contingencies. Though cash inflows and cash outflows are anticipated but there may be variations in these estimates. Such contingencies often arise in a business. A firm should keep some cash for such contingencies or it should be in a position to raise finances at a short period. The cash maintained for contingency needs is not productive or it remains idle. However, such cash may be invested in short-period or low-risk marketable securities which may provide cash as and when necessary.

Speculative Motive

The speculative motive relates to holding of cash for investing in profitable opportunities as and when they arise. Such opportunities do not come in a regular manner. These opportunities cannot be scientifically predicted. These transactions are speculative because prices may not move in a direction in which we suppose them to move.

Cash Management

Cash management has assumed importance because it is the most significant of all the current assets. It is required to meet business obligations and it is unproductive when not used. Cash management deals with the following:

i. Cash inflows and outflows

ii. Cash flows within the firm

iii. Cash balance held by the firm at a point of time.

Cash management needs strategies to deal with various facets of cash. Following are some of its facets:

a. Cash Planning

Cash planning is a technique to plan and control the use of cash. A project cash flow statement may be prepared, based on the present business operations and anticipated future activities.

b. Cash Forecasts and Budgeting

A cash budget is an estimate of cash receipts and disbursements during a future period of time. It is an analysis of flow of cash in business over a future, short or long period of time.

The finance manager will make estimates of likely receipts in the near future and the expected disbursements in that period. He should keep in mind the sources from where he will meet short-term needs. He should also plan for productive use of surplus cash for short periods.

The long-term cash forecast are also essential for proper cash planning. These estimates may be for three, four, five or more years. Long term forecasts indicate company's future financial needs for working capital, capital project etc.

Both short-term and long-term cash forecasts may be made with the help of following methods:

i. Receipts and disbursement method

ii. Adjusted net income method

i. Receipts and Disbursement Method. In this method the receipts and payments of cash are estimated. The cash receipts may be from cash sales, collections from debtors, sale of fixed assets, receipts of dividend or other income of all the items; it is difficult to forecast sales. The sales may be on cash as well as credit basis. Cash sales will bring receipts at the time of sale while credit sales will bring cash later on. The collections from debtors (credit sales) will depend upon the credit policy of the firm. Payments may be made for cash purchase, to creditors for goods, purchase of fixed assets, for meeting operating expenses such as wage bill, rent, rates, taxes or other usual expenses, dividend to shareholders etc.

Any shortfall in receipts will have to be met from banks or other sources. Similarly, surplus cash may be invested in risk free marketable securities.

ii. Adjusted Net Income Method. This method may also be known as sources and uses approach. It generally has three sections: sources of cash, uses of cash and adjusted cash balance. The adjusted net income method helps in projecting the company's need for cash at some future date and to see whether the company will be able to generate sufficient cash. If not, then it will have to decide about borrowing or issuing shares etc. This method helps in keeping a control on working capital and anticipating financial requirements.

MANAGING CASH FLOWS

After estimating the cash flows, efforts should be made to adhere to the estimates of receipts and payments of cash. Cash management will be successful only if cash collections are accelerated and cash disbursements, as far as possible are delayed. The following methods of cash management will help:

Method of Accelerating Cash Inflows

1. Prompt Payment by Customers. In order to accelerate cash inflows, the collections from customers should be prompt. This will be possible by prompt billing.

2. Quick conversion of Payment into cash. Cash inflows can be accelerated by improving the cash collecting process. Once the customer writes a cheque in favour of the concern the collection can be quickened by its early collection.

3. Decentralized Collections. A big firm operating over wide geographical area can accelerate collections by using the system of decentralised collections. A number of collecting centres are opened in different areas instead of collecting receipts at one place.

4. Lock Box System. Lock box system is another technique of reducing mailing, processing and collecting time. Under this system the firm selects some collecting centres at different places. The places are selected on the basis of number of consumers and the remittance to be received from a particular place. The firm hires a Post Box in post office and the parties are asked to send the cheques on that post box number. A local bank is authorised to operate the post box.

Methods of Slowing Cash Outflows

A company can keep cash by effectively controlling disbursements. The objective of controlling cash outflows is to slow down the payments as far as possible. Following methods can be used to delay disbursements:

1. Paying on Last Date. The disbursements can be delayed on making payments on the last due date only. If the credit is for 10 days then payment should be made on 10^{th} day only.

2. Adjusting Payroll Funds. Some economy can be exercised on payroll funds also. It can be done by reducing the frequency of payments. If the payments are made weekly then this period can be done to a month.

4. Centralisation of Payments. The payments should be centralised and payments should be made through drafts or cheques. When cheques are issued from the main office then it will take time for the cheques to be cleared through post.

5. Inter-bank Transfer. An efficient use of cash is also possible by inter-bank transfers. If the company has accounts with more than one bank then amounts can be transferred to the bank where disbursements are to be made.

6. Making use of Float. Float is the difference between the balances shown in company's cash book (Bank column) and balance in passbook of the bank. Whenever a cheque is issued, the balance at bank in cash book is reduced.

The party to whom the cheque is issued may not present it for payment immediately. If the party is at some other station then cheque will come through post and it may take a number of days before it is presented. Until the time, the cheque is not presented to the bank for payment, there will be a balance in the bank. The company can make use of this float if it is able to estimate it correctly.

Determining Optimum Cash Balance

A firm has to maintain a minimum amount of cash for settling the dues in time. The cash is needed to purchase raw materials, pay creditors, day to day expenses, dividend etc. The test of liquidity of the firm is that it is able to meet various obligations in time.

Thus, a firm should maintain an optimum cash balance, neither a small nor a large cash balance. Cash budget is the most important tool in cash management.

Cash budget

A cash budget is an estimate of cash receipts and disbursements of cash during a future period of time. It is a device to plan and control the use of cash. The cash budget pin points the period when there is likely to be excess or shortage of cash.

The cash receipts from various sources are anticipated. The estimated cash collections from sales, debts, bills receivable, interests, dividends and other incomes and sale of investments and other assets will be taken into account. The amounts to be spent on purchase of materials, payment to creditors and meeting various other revenue and capital expenditure needs should be considered. The preparation of cash budget has been explained in the problems below:

Problem 1. From the following forecast of income and expenditure, prepare a cash budget for the months January to April 2016.

	Months	Sales (Credit) Rs	Purchase (Credit) Rs	Wages Rs	Manufacturing expenses Rs	Administrative expenses Rs	Selling expenses Rs
2015	Nov.	30,000	15,000	3,000	1,150	1,060	500
	Dec.	35,000	20,000	3,200	1,225	1,040	550
2016	Jan.	25,000	15,000	2,500	990	1,100	600
	Feb.	30,000	20,000	3,000	1,050	1,150	620
	March	35,000	22,500	2,400	1,100	1,220	570
	April	40,000	25,000	2,600	1,200	1,180	710

Additional information is as follows:

1. The customers are allowed a credit period of 2 months

2. A dividend of Rs 10,000 is payable in April.
3. Capital expenditure to be incurred: Plant purchased on 15th January for Rs 5,000 ; a Building has been purchased on 1st March and the payments are to be made in monthly installments of Rs 2,000 each.
4. The creditors are allowing a credit of 2 months
5. Wages are paid on the 1st of the next month.
6. Lag in payment of other expenses is one month.
7. Balance of cash in hand on 1st January, 2016 is Rs 15,000.

Solution

Cash Budget

For months from January to April, 2016

ccccccccccccccccccccccccccccccccccccccccccccccccc

Details	January Rs	February Rs	March Rs	April Rs
Receipts				
Opening Balance of Cash	15,000	18,985	28,795	30,975
Cash realised from Debtors	30,000	35,000	25,000	30,000
Cash available	45,000	53,985	53,795	60,975
Payments				
Payments to Creditors (for purchase)	15,000	20,000	15,000	20,000
Wages	3,200	2,500	3,000	2,400
Manufacturing Expenses	1,225	990	1,050	1,100
Administrative Expenses	1,040	1,100	1,150	1,220
Selling Expenses	550	600	620	570
Payment of Dividend				10,000
Purchase of Plant	5,000			
Installment of Building Loan			2,000	2,000
Total Payments	26,015	25,190	22,820	37,290
Closing Balance	18,985	28,795	30,975	23,685

Problem 2.

ABC Company wishes to arrange overdraft facilities with its bankers during the period
April to June, 2016 when it will be manufacturing mostly for stock. Prepare a cash budget for the above period from the following data, indicating the extent of the bank facilities the company will require at the end of each month.

(a)	2016	Sales Rs	Purchase Rs	Wages Rs
	February	1,80,000	1,24,800	12,000
	March	1,92,000	1,44,000	14,000
	April	1,08,000	2,43,000	11,000
	May	1,74,000	2,46,000	10,000
	June	1,26,000	2,68,000	15,000

(b) 50 percent of credit sales are realised in the month following the sales and remaining 50 percent in the second month following. Creditors are paid in the month following the month of purchase.

(c) Cash at Bank on 01.04.2016 (estimated) Rs 25,000

Solution

Cash Budget for Three Months from April to June, 2011				
		April Rs	May Rs	June Rs
(a)	**Receipts :**			
	Opening Balance	25,000	53,000	(-)51,000
	Sales	90,000	96,000	54,000
	Amount received from Sales	96,000	54,000	87,000
	Total Receipts	2,11,000	2,03,000	90,000
(b)	**Payments:**			
	Purchases	1,44,000	2,43,000	2,46,000
	Wages	14,000	11,000	10,000
	Total Payments	1,58,000	2,54,000	2,56,000
			(-)51,000	
	Closing Balance (a-b)	53,000		(-)1,66,000

Note: Workers are paid on 1st of the following month, ie., wages for March will be paid in April and for April in May and so on.

Problem 3. From the following budget data, forecast the cash position at the end of April, May and June 2016.

Month	Sales Rs	Purchases Rs	Wages Rs	Miscellaneous
February	1,20,000	84,000	10,000	7,000
March	1,30,000	1,00,000	12,000	8,000
April	80,000	1,04,000	8,000	6,000
May	1,16,000	1,06,000	10,000	12,000
June	88,000	80,000	8,000	6,000

Additional Information:

Sales: 20% realised in the month of sales, discount allowed 2%. Balance realised equally in two subsequent months.

Purchase: These are paid in the month following the month of supply.

Wages: 25% paid in arrears following month.

Miscellaneous expenses. Paid a month in arrears.

Rent: Rs 1,000 per month paid quarterly in advance, due in April.

Income-tax: First installment of advance tax Rs 25,000 due on or before 15th June.

Income from investments. Rs 5,000 received quarterly, in April, July etc.

Cash in hand: Rs 5,000 in 1st April 2016.

Solution

Cash Budget

for the months from April to June 2016

	April Rs	**May** Rs	**June** Rs
Receipts			
Opening Balance	5,000	5,680	(-)7,084
Receipts from Debtors and Sales (1)	1,15,680	1,06,736	95,648
Income from Investments	5,000		
	1,25,680	1,12,416	88,564
Payments:			
Creditors	1,00,000	1,04,000	1,06,000
Wages (2)	9,000	9,500	8,500
Rent	3,000	--	--

Miscellaneous Expenses	8,000	6,000	12,000
Income tax	--	--	25,000
Closing Balance	1,20,000	1,19,500	1,51,500
	5,680	(-)7,084	(-)62,936

Working notes:

(1) Calculations of amount received from debtors and sales

April		
	Cash sales (20% on 80,000)	16,000
	Less 2% discount	320
		15,680
	Add 40% of Rs 1,30,000 (Sales March)	52,000
	Add 40% of Rs 1,20,000 (Sales of Feb.)	48,000
		1,15,680
May	Cash sales (20% 1,16,000)	23,200
	Less 2% discount	464
		22,736
	Add 40% of Rs 80,000 (Sales of April)	32,000
	Add 40% of Rs 1,30,000 (Sales of March)	52,000
		1,06,736
June	Cash sales 20% of 88,000	17,600
	Less 2% discount	352
		17,248
	Add 40% of Rs 1,16,000 (Sales for May)	46,400

	Add 40% of 80,000 (Sales of April)	32,000
	(2) *Calculation of payment for wages*	---
		95,648

April	25% of 12,000 Rs 12,000 (Wages for March)	3,000
	75% of Rs 8,000 (Wages for April	6,000

		9,000

May	25% of Rs 8,000 (Wages for April)	2,000
		7,500
	75% of Rs 10,000 (Wages for May)	---
		9,500

June	25% of Rs 10,000 (Wages for May)	2,500
	75% of Rs 8,000 (Wages of June)	6,000
		8,500

MANAGEMENT OF MARKETABLE SECURITIES

The marketable securities are the short term highly liquid investments in money market instruments that can easily be converted into cash. A firm has to maintain a reasonable balance of cash to keep the business going. Instead of keeping the surplus cash as idle, the firm should invest in marketable securities so as to earn some income to the business. As the amount of cash kept in the business earns no explicit return, the firm should hold a minimum level of cash and the excess balance of cash may be invested in marketable securities which earns some return as well as provide opportunities to be converted easily into cash (through sale of securities) as and when required.

The management of investments in marketable securities is an important function of financial management. The basic objective of investment in marketable

securities is to earn some return for the business. Thus, the return available is an important criterion while choosing among the alternative securities, yet investment of surplus cash in marketable securities need a prudent and cautious approach. The selection of securities should be carefully made so that cash can be raised quickly on demand by sale of these securities. The following are some of the important factors that should be considered while choosing among alternative securities to be purchased:

1. Safety. Since a firm invests cash in marketable securities to earn some return on surplus cash but with the primary motive of converting them back into cash easily through sale of securities as and when required, the firm will tend to invest in very safe marketable securities.

2. Maturity. The maturity of the marketable securities should be matched with the length of time for which the surplus cash is expected to be available.

3. Liquidity and Marketability. Liquidity refers to the ability to convert a security into cash immediately without any significant loss of value. So the securities selected should have ready market and may be realisable in a very short-period as and when required even before the maturity date.

4. Return or Yield. Other things equal, a firm would like to choose the securities which give higher return of yield on its investment. However, it must be remembered that safety and liquidity risk are of greater importance than the return risk in making decision about investments in marketable securities.

Review Questions

Essay Type

1. What do you understand by cash management? How can it be undertaken?
2. "Efficient cash management will aim at maximizing the cash inflows and showing cash outflows."
3. What is a lock box system? How does it help to reduce the cash balances?

4. Explain various methods of investing surplus cash. What criteria should a firm use in investing in marketable securities?

5. Explain and illustrate the utility and preparation of cash budget as a tool of cash management.

6. "The twin objectives in managing the cash flows should be to accelerate cash collection and decelerate or delay cash disbursements as much as possible." Discuss.

1. Prepare cash budget for July-December from the following information.

(i) The estimated sales, expenses etc., are as follows:

	June	July	Aug.	Sept.	Oct.	Nov.	Rs lakhs) Dec.
Sales	35	40	40	50	50	60	65
Purchases	14	16	17	20	20	25	28
Wages and Salaries	12	14	14	18	18	20	22
Misc. Expenses	5	6	6	6	7	7	7
Interest Received	2	-	-	2	-	-	2
Sales of Shares	-	-	20	-	-	-	-

ii. 20% of the sales are on cash and the balance on credit.

iii. 1% of the credit sales are returned by the customers. 2% of the total accounts receivable constitute bad debt losses. 50% of the good account receivable are collected in the month of the sales, and the rest in the next month.

iv. The time lag in the payment of misc. expenses and purchases is one month. Wages and salaries are paid fortnightly with a time lag of 15 days.

v. The company keeps minimum cash balance of Rs 5 lakhs. Cash in excess of Rs 7 lakhs is invested in Govt. securities in the multiple of Rs 1 lakh, Shortfalls in the minimum cash balance are made good by borrowing from banks. Ignore interest received and paid.

2. From the following information, prepare a cash budget for the months of January to April.

	Expected Purchase Rs	Expected Sales Rs
January	48,000	60,000
February	80,000	40,000
March	81,000	45,000
April	90,000	40,000

Wages to be paid to workers Rs 5,000 each month, Balance at Bank on 1st January Rs 8,000.

It has been decided by the management that:

i. In case of deficit of fund within the limit of Rs 10,000 an arrangement can be made with the bank.

iii. In case of deficit of fund exceeding Rs 10,000 but within the limit of Rs 42,000 issue of debentures is to be preferred.

iii. In case of deficit of fund exceeding Rs 42,000 issue of shares is preferred (considering the fact that it is within the limit of authorised capital)

(Ans: Total deficiency Rs 1,26,000; Total receipts Rs 1,93,000. Total payments Rs 3,19,000)

4. A company expects to have Rs 25,000 in bank on 1st May 2011, and requires you to prepare an estimate of cash position during the three months – May June and July, 2011.

Month	**Sale**	**Purchase**	**Wages**	**Office expenses**	**Factory Expenses**	**Selling Expenses**
March	50,000	30,000	6,000	4,000	5,000	3,000
April	56,000	32,000	6,500	4,000	5,500	3,000
May	60,000	35,000	7,000	4,000	6,000	3,500
June	80,000	40,000	9,000	4,000	7,500	4,500
July	90,000	40,000	9,500	4,000	8,000	4,500

Other Information:

1. 20% of sales are in cash, remaining amount is collected in the month following that of sales

ii. Suppliers supply goods at two month's credit

iii. Wages and all other expenses are paid in the month following the one in which they are incurred.

iv. The company pays dividends to shareholders and bonus to workers of Rs 10,000 and Rs 15,000 respectively in the month of May.

v. Plant has been ordered and is expected to be received in June. It will cost Rs 80,000 to be paid.

vi. Income tax Rs 25,000 is payable in July.

(Ans. Balance May Rs 7,800, June Rs (-) 60,700 in July Rs (-) 63,700)

Name of service or undertaking	Cost unit
Passenger Transport	Per passenger kilometre
Goods Transport	Per tonne kilometre
Hospital	Per patient bed or per patient day or week
Electricity Supply	Per kilowatt hour (KWH)
Canteen	Per meal person
Cinema Theatre	Per man show
Hotel or Lodge	Per person perday

Classification of Costs

In service costing, costs are classified into three heads as follows:

1. Fixed Costs or Standing Charges – These include salary of operating manager, supervisor etc, insurance, motor vehicle tax
2. Semi - variable Costs, Maintenance Charges, or Manufacturing Charges
3. Variable Costs or Operating and Running Charges

The classification of various items of costs into the above three groups should not be attempted as a matter of rule. It depends basically on the circumstances of each case.

Transport Costing

Transport industries include air, water, road and railways. Motor transport includes private cars, buses, taxis, carriers, lorries etc. The objectives of motor transport costing may be as under:

1. It helps in controlling, operating and maintenance costs.
2. Cost of using own vehicle and hired vehicle can be compared.
3. Operating costs of different vehicles can be compared and thus efficiency can be improved.
4. Comparison of oil consumption and time taken for a trip with other trips is possible.
5. Proper apportionment of costs to different departments which use the service is possible.
6. It provides information for giving quotation and fixing the rates.

Procedure of Operating Costing

While determining the operating costs in transport undertakings the following procedure is adopted:

a) Collection of costs
b) Classification of costs
c) Selection of appropriate cost unit
d) Preparation of operating cost statement.

UNIT- 6

INVENTORY MANAGEMENT

Learning Objectives:

- Understand the meaning and nature of inventory
- Purpose of holding inventories
- Risk and costs of holding inventories
- Inventory management
- Tools and techniques of inventory management
- Determination of stock levels

INTRODUCTION

Every enterprise needs inventory for smooth running of its activities. It serves as a link between production and distribution processes. There is, generally, a time lag between the recognition of a need and its fulfilment. The greater the time-lag, the higher the requirements for inventory. The unforeseen fluctuations in demand and supply of goods also necessitate the need for inventory. It also provides a cushion for future price fluctuations.

The investment in inventories constitutes the most significant part of current assets/working capital in most of the undertakings. Thus, it is very essential to have proper control and management of inventories. The purpose of inventory management is to ensure availability of materials in sufficient quantity as and when required and also to minimise investment in inventories.

MEANING AND NATURE OF INVENTORY

Inventory includes the following things:

(a) Raw Material. Raw materials form a major input into the organisation. They are required to carry out production activities uninterruptedly.

(b) Work-in-Progress. The work-in-progress is that stage of stocks which are in between raw materials and finished goods.

(c) Consumables. These are the materials which are needed to smoothen the process of production. These materials do not directly enter production but they act as catalysts, etc. Consumables may be classified according to their consumption and criticality. Generally, consumable stores do not create any supply problem and form a small part of production cost. There can be instances where these materials may account for much value than the raw materials. The fuel oil may form a substantial part of cost.

(d) Finished goods. These are the goods which are ready for the consumers. The stock of finished goods provides a buffer between production and market. The purpose of maintaining inventory is to ensure proper supply of goods to customers.

(e) Spares. Spares also form a part of inventory. The Consumption pattern of raw materials, consumables, finished goods are different from that of spares. The stocking policies of spares are different from industry to industry. Some industries like transport will require more spares than the other concerns. The costly spare parts like engines, maintenance spares etc. are not discarded after use, rather they are kept in ready position for further use. All decisions about spares are based on the financial cost of inventory on such spares and the costs that may arise due to their non-availability

Purpose/Benefits of Holding Inventories

Al though holding inventories involves blocking of firm's funds and the costs of storage and handling, every business enterprise has to maintain a certain level of inventories to facilitate uninterrupted production and smooth running of business. Generally speaking, there are three main purposes or motives of holding inventories:

i. The Transaction Motive which facilities continuous production and timely execution of sales orders.
ii. The Precautionary Motive which necessitates the holding of inventories for meeting the unpredictable changes in demand and supplies of materials.
iii. The Speculative Motive which induces to keep inventories for taking advantage of price fluctuations, saving in re-ordering costs and quantity discounts, etc.

Risk and Costs of Holding Inventories

The holding of inventories involves blocking of a firm's funds and incurrence of capital and other costs. It also exposes the firm to certain risks. The various costs and risks involved in holding inventories are as below:

(i) Capital Costs. Maintaining of inventories results in blocking of the firm's financial resources. The firm has, therefore, to arrange for additional funds to meet the cost of inventories.

(ii) Storage and Handling costs. Holding of inventories also involves costs on storage as well as handling of materials. The storage costs include the rental of the go down, insurance charges, etc.

(ii) Risk of Price Decline. There is always a risk of reduction in the prices of inventories by the suppliers in holding inventories. This may be due to increased market supplies, competition or general depression in the market.

(iii) Risk of Obsolescence. The inventories may become obsolete due to improved technology, changes in requirements, change in customer's tastes, etc.

(iv) Risk Deterioration in Quality. The quality of the materials may also deteriorate while the inventories are kept in stores.

INVENTOTRY MANAGEMENT

It is necessary for every management to give proper attention in inventory management. A proper planning of purchasing, handling, storing and accounting should form a part of inventory management. An efficient system of inventory

management will determine (a) what to purchase (b) how much to purchase (c) from where to purchase (d) where to store etc.

OBJECTS OF INVENTORY MANAGEMENT

The following are the objectives of inventory management.

1. The ensure continuous supply of materials, spares and finished goods so that production should not suffer at any time and the customers demand should also be met.
2. To avoid both over-stocking and under-stock of inventory.
3. To maintain investments in inventories at the optimum level as required by the operational and sales activities.
4. To keep material cost under control so that they contributes in reducing cost of production and overall costs.
5. To eliminate duplication in order or replenishing stocks. This is possible with the help of centralising purchases.
6. To minimise losses through deterioration, pilferage, wastages and damages.
7. To design proper organisation for inventory management. A clear cut accountability should be fixed at various levels of the organisation.
8. To ensure perpetual inventory control so that materials shown in stock ledgers should be actually lying in the stores.
9. To ensue right quality goods at reasonable price. Suitable quality standards will ensure proper quality of stocks. The price-analysis, the cost-analysis and value-analysis will ensure payment of proper prices.
10. To facilitate furnishing of data for short-term and long-term planning and control of inventory.

TOOLS AND TECHNIQUES OF INVENTORY MANAGEMENT

The following are the important tools and techniques of inventory management and control:

1. Determination of Stock Levels.
2. Determination of Safety Stocks
3. Selecting a proper System of Ordering for Inventory
4. Determination of Economic Order Quantity
5. A.B.C. Analysis
6. V.E.D Analysis
7. Inventory Turnover Ratios
8. Aging Schedule of Inventories
9. Classification and Codification of Inventories
10. Preparation of Inventory Reports
11. Lead Time
12. Perpetual Inventory System
13. JIT Control System

1. Determination of Stock Levels

Carrying of too much and too little of inventories is detrimental to the firm. If the inventory level is too little, the firm will face frequent stock-outs involving heavy ordering cost and if the inventory level is too high it will be unnecessary tie-up of capital. Therefore, an efficient inventory management requires that a firm should maintain an optimum level of inventory where inventory costs are the minimum and at the same time there is no stock-out which may result in loss of sale or stoppage of production. Various stock levels are discussed as such.

(a) Minimum Level. This represents the quantity which must be maintained in hand at all times. If stock is less than the minimum level then the work will stop due to shortage of materials. Following factors are taken into account while fixing minimum stock level.

Lead Time. A purchasing firm requires some time to process the order and time is also required by the supplying firm to execute the order. The time taken in processing the order and then executing it is known as lead time. It is essential to maintain some inventory during this period.

Rate of Consumption. It is the average consumption of materials in the factory. The rate of consumption will be decided on the basis of past experience and production plans.

Nature of Material. The nature of material also affects the minimum level. If a material is required only against special orders of the customer then minimum stock will not be required for such materials. Minimum stock level can be calculated with the help of following formula:

Minimum stock level=Re-ordering level-(Normal consumption x Normal Re-order period)

(b) Re-ordering Level. When the quantity of materials reaches at a certain figure then fresh order is sent to get materials again. The order is sent before the materials reach minimum stock level. Re-ordering level or ordering level is fixed between minimum level and maximum level. The rate of consumption, number of days required to replenish the stocks, and maximum quantity of materials required on any day are taken into account while fixing re-ordering level. Re-ordering level is fixed with the following formula:

Re-ordering Level = Maximum Consumption x Maximum Re-order period

(c) Maximum Level. It is the quantity of materials beyond which a firm should not exceed its stocks. If the quantity exceeds maximum level limit then it will be overstocking. A firm should avoid overstocking because it will result in high material

cost. Overstocking will mean blocking of more working capital, more space for storing the materials, more wastage of materials and more chances of losses from obsolescence. Maximum stock level will depend upon the following factors.

1) The availability of capital for the purchase of materials.
2) The maximum requirements of materials at any point of time.
3) The availability of space for storing the materials.

4) The rate of consumption of materials during lead time.
5) The cost of maintaining the stores.
6) The possibility of fluctuations in prices.
7) The nature of materials. If the materials are perishable in nature, then they cannot be stored for long.
8) Availability of materials. If the materials are available only during seasons then they will have to be stored for the rest of the period.
9) Restrictions imposed by the Government. Sometimes, government fixes the maximum quantity of materials which a concern can store. The limit fixed by the government will become the limiting factor and maximum level cannot be fixed more than this limit.
10) The possibility of change in fashions will also affect the maximum level.

The following formula may be used for calculating maximum stock level:

Maximum Stock Level= Re-ordering Level+Re-ordering Quantity-(Minimum Consumption x Minimum Re-ordering period)

(d) Danger Level

It is the level beyond which materials should not fall in any case. Danger level is determined with the following formula:

Danger Level=Average Consumption x Maximum re-order period for emergency purchases

(e) Average Stock Level

The average stock level is calculated as such:

Average Stock Level = Minimum Stock Level + ½ of re-order quantity

(1) Determination of Safety Stocks

Safety stock is a buffer to meet some unanticipated increase in usage. In order to protect against the stock out arising out of usage fluctuations, firms usually maintain some margin of safety or safety stocks.

3. Ordering Systems of Inventory

The basic problem of inventory is to decide the re-order point. This point indicates when an order should be placed. The re-order point is determined with the help of these things: (a) average consumption rate, (b) duration of lead time (c) economic order quantity, when the inventory is depleted to lead time consumption, the order should be placed. There are three prevalent systems of ordering and a concern can choose any one of these:

a) Fixed order quantity system generally known as economic order quantity (EOQ) system;
b) Fixed period order system or periodic re-ordering system or periodic review system;
c) Single order and scheduled part delivery system.

4. Economic Order Quantity (EOQ)

A decision about how much to order has great significance in inventory management. The quantity to be purchased should neither be small nor big because costs of buying and carrying materials are very high. Economic order quantity is the size of the lot to be purchased which is economically viable. This is the quantity of materials which can be purchased at minimum costs. Generally, economic order quantity is the point at which inventory carrying costs are equal to order costs. In determining economic order quantity it is assumed that cost of managing inventory is made up solely of two parts *ie.* ordering costs and carrying costs.

(A) Ordering costs. These are the costs which are associated with the purchasing or ordering of materials. These costs include:

1) Costs of staff posted for ordering of goods. A purchase orders is processed and then placed with suppliers. The labour spent on this process is included in ordering costs.
2) Expenses incurred on transportation of goods purchased
3) Inspection costs of incoming materials.
4) Cost of stationery, typing, postage, telephone charges, etc.

These costs are also known as buying costs and will arise only when some purchases are made.

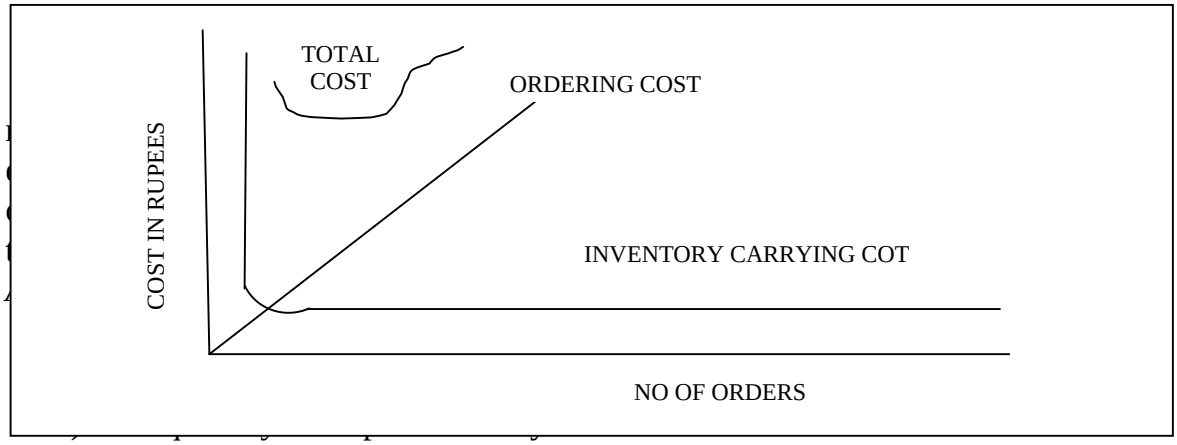
When materials are manufactured in the concern then these costs will be known as set-up costs. These costs will include costs of setting up machinery for manufacturing materials, time taken up in setting, costs of tools, etc.

The ordering costs are totalled up for the year and then divided by the number of orders placed each year. The Planning Commission of India has estimated these costs between Rs 10 to Rs 20 per order.

(B) Carrying Costs. These are the costs for holding the inventories. These costs will not be incurred if inventories are not carried. These costs include:

1) The cost of capital invested in inventories. An interest will be paid on the amount of capital locked-up in inventories.
2) Cost of storage which could have been used for other purposes.
3) The loss of materials due to deterioration and obsolescence. The materials may deteriorate with passage of time. The loss of obsolescence arises when the materials in stock are not usable because of change in process or product.
4) Insurance cost
5) Cost of spoilage in handling of materials.

The Planning Commission of India had estimated these costs between 15 per cent to 20 per cent of total costs. The longer the materials kept in stocks, the costlier it becomes by 20 per cent every year. The ordering and carrying costs have a reverse relationship. The ordering cost goes up with the increase in number of orders placed. On the other hand, carrying costs go down per unit with the increase in number of units, purchased and stored. It can be shown in the diagram as below.



3) The prices of goods are stable. It results to stabilise carrying costs.

When above-mentioned conditions are satisfied, economic order quantity can be calculated with the help of the following formula:

$$EOQ = \sqrt{\frac{2AS}{I}}$$

Where,

A = Annual consumption in rupees.

S = Cost of placing an order.

I = Inventory carrying costs of one unit.

The materials are divided into a number of categories for adopting a selective approach for material control. It is generally seen that in manufacturing concern, a small percentage of items contribute a large percentage of value of consumption and a large percentage of items of materials contribute a small percentage of value. In between these two limits there are some items which have almost equal percentage of value of materials. Under A-B-C analysis, the materials are divided into three categories *viz*., A, B and C. Past experience has shown that almost 10 per cent of the items contribute to 70 per cent of value of consumption and this category is called 'A' Category. About 20 per cent of the items contribute about 20 percent of value of consumption and this is known as category 'B' materials. Category 'C' covers about 7per cent of items of materials which contribute only 10 percent of value of consumption. There may be some variation in different organisations and an adjustment can be made in these percentages.

6. VED Analysis

The VED analysis is used generally for spare parts. Spare parts are classified as Vital (V), Essential (E) and Desirable (D). The vital spares are a must for running the concern smoothly and these must be stored adequately. The non-availability of vital spares will cause havoc in the concern. The E type of spares are also necessary but their stocks may be kept at low figures. The stocking of D type of spares may be avoided at times. If the lead time of these spares is less, then stocking of these spares can be avoided.

7. Inventory Turnover Ratios

Inventory turnover ratios are calculated to indicate whether inventories have been used efficiently or not.

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

$$\text{Or} = \frac{\text{Net Sales}}{\text{(Average) Inventory}}$$

$$\text{and, Inventory Conversion Period} = \frac{\text{Days in a year}}{\text{Inventory Turnover Ratio}}$$

8. Aging Schedule of Inventories

Classification of inventories according to the period (age) of their holding also helps in identifying slow moving inventories thereby helping in effective control and management of inventories.

9. Classification and Codification of Inventories

The classification and coding of inventories enables the introduction of mechanised accounting. It also helps in maintaining secrecy of description. It also helps the prompt issue of stores.

10. Inventory Reports

From effective inventory control, the management should be kept informed with the latest stock position of different items. This is usually done by preparing periodical inventory reports. These reports should contain all information necessary for managerial action. On the basis of these reports management takes corrective action wherever necessary. The more frequently these reports are prepared the less will be the chances of lapse in the administration of inventories.

11. Lead Time

Lead time is the period that elapses between the recognition of a need and its fulfilment. There is a direct relationship between lead time and inventories. The level of inventory of an item depends upon the length of its lead time. Suppose, lead time is one month. Any action taken now will have an effect only one month later. So inventory for the current month must be in hand. During lead time there will be no delivery of materials and consuming departments will have to be served from the inventories held.

Lead time has two components: Lead time for company (administrative lead time) from initiation of procurement action until the placing of an order, and the lead time for the producer, known as delivery lead time from the placing of an order until the delivery of the ordered material. Administrative lead time also follows after the delivery is taken. The functions of inspection, material handling, and transportation in the factory also take some time. Administrative lead time is in the hands of those who are dealing with material procurement. Delivery lead time has to be negotiated at the time of preparing purchase contract.

It is often seen that bulk of the lead time is taken up by administrative lead time. This is the time over which company has control but still too much time is taken up in receiving and inspection of goods. A businessman may find to his frustration that the goods which he has persuaded a supplier to deliver in an extremely short time have been lying in his own goods inwards department after

delivery. Stock control or purchase section of the organization should maintain lead time schedules for all groups of materials.

12. Perpetual Inventory System

The stock taking may either be done annually or continuously. In the latter method, the stock taking continues throughout the year. A schedule is prepared for stock taking of various bins (store rooms). One bin is selected at random and the goods are checked as per shown in the bin card. Then some other bin is selected at random and so on. The personnel associated with store-keeping are not told of stock taking programme because store rooms are chosen at random. The Institute of Cost and Management Accountants, London defines perpetual inventory system as "a system of records maintained by the controlling department, which reflects the physical movements of stocks and their current balance". The stores ledger and bin cards are helpful in this system because these records help in knowing the movement of stores. This facilitates regular checking of stores without closing down the plant.

1.3 Just In Time (JIT) Inventory control System

Just in time philosophy, which aims at eliminating waste from every aspect of manufacturing and its related activities, was first developed in Japan. Toyota introduced this technique in 1950's in Japan, however, U.S. companies started using this technique in 1980's. The term JIT refers to a management tool that helps to produce only the needed quantities at the needed time.

Problem 1. From the following information, calculate minimums stock level, maximum stock level and re-ordering level:

(i)	Maximum consumption	200 units per day
(ii)	Minimum consumption	150 units per day
(iii)	Normal consumption	160 units per day
(iv)	Re-order period	10-15 days
(v)	Re-order quantity	1,600 units
(vi)	Normal re-order period	12 days

Solution

Re-ordering Level = Maximum Consumption x Maximum Re-order period
=200 units x15=3,000 units.

Minimum Stock Level= Re-ordering level-(Normal Consumption x Normal Re-ordering period)
= 3,000 – (160 x 12)
= 3000 – 1,920
= 1,080 units

Maximum stock level = Re-ordering level +Re-order quantity- (Maximum consumption x Minimum re- order period
= 3,000 + 1,600 – (150 x 10)
= 3,000 + 1,600 – 1500
= 3,100 units

Problem 2. From the following information, find out Economic Order Quantity.
Annual Usage, 10,000 units
Cost of placing and receiving one order Rs 50
Cost of materials per unit Rs. 25
Annual carrying cost of one unit : 10% of inventory value.

Solution:

$$ECQ = \sqrt{\frac{2AS}{1}}$$

Where, A = Annual consumption in units
S = Cost of placing an order
I = Inventory carrying cost of one unit

$$EOQ = \sqrt{\frac{2x10,000 \text{ x } 50}{2.5}} \left[\text{as} 1 = \frac{25x10}{100} 2.5 \right]$$

$$= \sqrt{4,00,000} = 632 \text{ units}$$

Solution:

$$\text{Inventory Turnover Ratio} = \frac{\text{Cost of Goods sold}}{\text{Average Inventory at Cost}}$$

$$= \frac{5,00,000}{\frac{40,000 + 60,000}{2}}$$

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

Problem 4. Following information is given about materials:
Annual usage = Rs. 2,00,000
Cost of placing and receiving one order: Rs 80
Annual carrying cost: 10% of inventory value
Find out the economic order quantity

Solution:

$$ECQ = \sqrt{\frac{2AS}{1}}$$

Where, A = Annual usage is Rs. 2,00,000
S = Cost of placing an order is Rs. 80
I = Annual carrying cost is 10% of material value

$$EOQ = \frac{\sqrt{\frac{2x20,000 \text{ x } 80}{10\%}}}{\sqrt{\frac{2x20,000 \text{ x } 80x100}{10}}}$$

$$= \sqrt{3,20,00,000} = 14,833 \text{ units}$$

Problem 5. The annual demand for a product is 6,400 units. The unit cost is Rs 6 and inventory carrying cost per unit per annum is 25% of the average inventory cost. If the cost of procurement is Rs 75 determine:

(a) Economic Order Quantity (EOQ)
(b) Number of orders per annum; and
(c) Time between two consecutive orders.

Solution:

(a) $$ECQ = \sqrt{\frac{2AS}{1}}$$

Where, A = Annual consumption in units = 6,400 units

S = Cost of placing an order is 75

I = Inventory carrying cost of one unit = $6\frac{25}{100} = \text{Rs.}1.50$

$$\text{EOQ} = \sqrt{\frac{2\text{x}6400\text{ x }75}{1.50}}$$

$$\sqrt{\frac{9,60,000}{1.50}}$$

$$= \sqrt{6,40,000} = 800 \text{ units}$$

(b) Number of orders per annum $= \frac{6,400}{800} = 8 \text{ orders}$

(c) Time between two consecutive orders $\frac{12 \text{ months}}{8 \text{ orders}} = 1.5 \text{ months}$

Problem 6. Gotham Ltd. produces a product which has a monthly demand of 4,000 units. The product requires a component X which is purchased at Rs 20. For every finished product, one unit of the component is required. The ordering cost is Rs 120 per order and the holding cost is 10% p.a.

You are required to calculate:

(i) Economic order quantity
(ii) If the minimum lot size to be supplied is 4000 units, what is the extra cost, the company has to incur?

Solution:

a) Economic order Quantity $(ECQ) = \sqrt{\frac{2AS}{1}}$

Where, A = Annual consumption in units = 4,000 x 12 = 48,000 units
S = Cost of placing an order is Rs 120

$$I = \text{Inventory carrying cost} = 20 \text{ x } \frac{10}{100} = \text{Rs. } 2$$

$$ECQ = \sqrt{\frac{2 \text{x} 48{,}000 \text{x} 120}{2}}$$

$$= \sqrt{\frac{1{,}15{,}20{,}000}{2}}$$

$$= \sqrt{57{,}60{,}000} = 2{,}400 \text{ units}$$

(b) Statement showing comparative inventory carrying cost

	Lot size = 2400 units	Lot size =4,000 units
Ordering cost $\left(\frac{48{,}000}{2{,}400} \text{x} 120\right)$ and $\left(\frac{48{,}000}{4{,}000} \text{x} 120\right)$	Rs 2,400	Rs 1,440
Carrying cost $\left(2{,}400 \text{ x } \frac{1}{2} \text{ x } 20 \text{ x } \frac{10}{100}\right)$ and $\left(4{,}000 \text{ x } \frac{1}{2} \text{ x } 20 \text{ x } \frac{10}{100}\right)$	Rs 2,400	Rs 4,000
Total Inventory Carrying cost	Rs 4,800	Rs 5,440

Extra Cost if lot size of 4,000 units is supplied = Rs 5,440 – Rs 4,800
= Rs 640

Problem 7. Vision Tubes Ltd. is the manufacturers of picture tubes for TV. The following are the details of their operations during 2015-2016.

Ordering cost	Rs 100 per order
Inventory carrying cost	20% p.a
Cost of tubes	Rs 500 per tube
Normal usage	100 tubes per week
Minimum usage	50 tubes
Maximum usage	200 tubes per week
Lead time to supply	6-8 weeks

Required:

(i) Economic order quantity. If the supplier is willing to supply 1500 units at a discount of 5% is it worth accepting?
(ii) Re-order level
(iii) Maximum level of stock

(iv) Minimum level of stock

Solution

(i) Economic Order Quantity

$$(ECQ) = \sqrt{\frac{2AS}{1}}$$

A = Annual consumption = 100 x 52 = 5200 units

S = Cost of placing an order = Rs 100

I =Inventory carrying cost of one unit

$$= 500 \text{ x } \frac{20}{100} = \text{Rs.}100$$

$$(ECQ) = \sqrt{\frac{2\text{x } 5200 \text{ x}100}{1100}}$$

$$= \sqrt{10{,}400} = 102 \text{ trubes appex}$$

Review Questions

1) What do you mean by inventory?
2) What is the nature of inventories?
3) Give three objectives of holding inventories.
4) What are the risks and costs of holding inventories?
5) Name various tools of inventory management.
6) Explain danger level of inventories.
7) What is VED analysis?
8) What is inventory turnover ratio?
9) What is meant by Inventory Management? What is it essential to a business concern?
10) Define the term 'Inventory Control'. What are the Inventory Control System?
11) Explain various tools and techniques used for inventory management?
12) What is A-B-C analysis? How is it useful as a tool of inventory management?
13) What is meant by 'Economic Order Quantity'? What are the various costs which affect economic order quantity?

Exercise

1. A manufacturing company uses Rs 1,00,000 materials per year. The administration cost per purchase is Rs 100, and carrying cost is 20% of the average inventory. Calculate Economic Order Quantity for the company.

(Ans. Rs 10,000)

2. A manufacturer buys certain equipment from outside suppliers at Rs 30 per unit. Total annual needs are 800 units. The following further data are available:

Annual return on investment, 10%

Rent, insurance, taxes per unit per year, Rs.1

Cost of placing an order, Rs 100.

Determine the economic order quantity.

(Ans. 200 units)

3. What do you understand by maximum level, minimum level, re-ordering level? Calculate the above from the following data:

Re-order quantity	1,500 units
Re-order period	4 to 6 weeks
Maximum consumption	400 units per week
Normal consumption	300 units per week
Minimum consumption	250 units per week

(Ans: Re-order quantity 2,400 units; Maximum level 2,900 units; Minimum level 900 units)

4. Two materials, X and Y are used as follows:
   Minimum usage – 50 units per week each;
   Maximum usage – 150 units per week each;
   Normal usage – 100 units per week each;
   Ordering quantity: X-600 units and Y-1,000 units;
   Delivery period : X-4 to 6 weeks; Y-2 to 4 weeks
   Calculate for each material:
   (a) Minimum level, (b) Maximum level, (c) Ordering level.

(Ans: (a) X = 400 units, Y = 300 units; (b) X=1,300 units, Y=1,500 units; (c) X=900 units, Y=600 units

5. The following information is available in respect of component 020:

Maximum stock level	8,400 units
Budgeted Consumption	Maximum 1,500 units per month
Maximum consumption	Minimum 800 units per month
Estimated delivery period	Maximum 4 months
	Minimum 2 months

You are required to calculate:
(a) Re-order level
(b) Re-order quantity
(Ans: (i) 6,000 units; (ii) 4,000 units)

6. Ace Ltd. Manufactures a product and the following particulars are collected for the year ended March, 2011:

Monthly demand	100 units
Cost of placing an order	Rs 100
Annual carrying cost	Rs 15 per unit
Normal usage	50 units per week
Minimum usage	25 units per week
Maximum usage	75 units per week
Re-order period	4-6 weeks

You are required to calculate:
Re-order quantity

Re-order level

Minimum level

Maximum level

Average stock level

(Ans:(a) 186 units, (ii) 450 units; (iii) 200 units; (iv) 536 units; (v) 368 units, or 293 units)

UNIT – 7

RECEIVABLES MANAGEMENT

Learning objectives

- *Understand the meaning of receivables*
- *Costs of maintaining receivables*
- *Factors influencing the size of receivables*
- *Meaning and objectives of receivables management*
- *Dimensions of receivables management*

INTRODUCTION

An efficient use of financial resources is necessary to avoid financials distress. Receivables result from credit sales. A concern is required to allow credit sales in order to expand its sales volume. It is not always possible to sell good on gash basis only.

Thus receivable constitute a significant portion of current assets of a firm. But, for investment in receivables, a firm has to incur certain costs. Further, there is a risk of bad debts also. It is, therefore, very necessary to have a proper control and management of receivables.

Meaning of Receivable

Receivables represent amounts owed to the firm as a result of sale of goods or services in the ordinary course of business. Receivables are also known as accounts receivables, trade receivables, customer receivables or book debts. The purpose of maintaining or investing in receivable is to meet competition, and to increase the sales and profits.

Costs of Maintaining Receivables

The allowing of credit to customers means given of funds for the customer's use. The concern incurs the following costs on maintaining receivables:

1. Cost of Financing, Receivables. When goods and services are provided on credit then concern's capital is allowed to be used by the customers. The receivables are financed from the funds supplied by shareholders for long term

financing and through retained earnings. The concern incurs some cost for collecting funds which finance receivables.

2. Cost of Collection. A proper collection of receivables is essential for receivables management. The customers who do not pay the money during a stipulated credit period are sent reminders for early payments. Some persons may have to be sent for collecting these amounts. In some cases legal recourse may have to be taken for collecting receivables. All these costs are known as collection costs which a concern is generally required to incur.

3. Bad debts. Some customers may fail to pay the amounts due towards them. The amounts which the customers fail to pay are known as bad debts. Though a concern may be able for reduce bad debts through efficient collection machinery but one cannot altogether rule out this cost.

Factors Influencing the Size of Receivables

Besides sales, a number of other factors also influence the size of receivables. The following factors directly and indirectly affect the size of receivables.

(**1). Size of Credit Sales.** The volume of credit sales is the first factor which increases or decreases the size of receivables. If a concern sells only on cash basis, as in the case of Bata Shoe Company, then there will be no receivables. The higher the part of credit sales out of total sales, figures of receivables will also be more or vice versa.

(2) Credit Policies. A firm with conservative credit policy will have a low size of receivable while a firm with liberal credit policy will be increasing this figure. The vigour with which the concern collects the receivables also affects its receivables. If collections are prompt then even if credit is liberally extended the size of receivables will remain under control. In case receivables remain outstanding for a longer period, there is always a possibility of bad debts.

(**3). Terms of Trade.** The size of receivables also depends upon the terms of trade. The period of credit allowed and rates of discount given are linked with receivables. If credit period allowed is more than receivables will also be more. Sometimes trade policies of competitors have to be followed otherwise it becomes difficult to expand the sales. The trade terms once followed cannot be changed without adversely affecting sales opportunities.

(4) Expansion Plans. When a concern wants to expand its activities, it will have to enter new markets. To attract customers, it will give incentives in the form

of credit facilities. The periods of credit can be reduced when the firm is able to get permanent customers. In the early stages of expansion more credit becomes essential and size of receivable will be more.

(5) Relation with Profits. The credit policy is followed with a view to increase sales. When sales increase beyond a certain level the additional costs incurred are less than the increase in revenues. It will be beneficial to increase sales beyond a point because it will bring more profits. The increase in profits will be followed by an increase in the size of receivable or vice-versa.

(6) Credit Collection efforts. The collection of credit should be streamlined. The customers should be sent periodical reminders if they fail to pay in time.

(7) Habits of Customers. The paying habit of customers also have a bearing on the size of receivables. The customers may be in the habit of delaying payments even though they are financially sound. The concern should remain in touch with such customers and should make them realise the urgency of their needs.

Meaning And Objectives Of Receivable Management

Receivables management is the process of making decisions relating to investment in trade debts. We have already stated that certain investment in receivables is necessary to increase the sale and the profits of firm.

Dimensions of Receivables Management

Receivables management involves the careful consideration of the following aspects:

1. Forming the credit policy
2. Executing the credit policy
3. Formulating and executing collection policy.

1. FORMING OF CREDIT POLICY

For efficient management of receivables, a concern must adopt a credit policy. A credit policy is related to decisions such as credit standards, length of credit period, cash discount and discount period etc. should compare the earnings resulting from released funds and the cost of discount. The discount should be

allowed only of its cost is less than the earnings from additional funds. If the funds, cannot be profitably employed then discount should not be allowed.

(d) Discount period. The collection of receivables is influenced by the period allowed for availing the discount. The additional period allowed for this facility may prompt some more customers to avail discount and make payments. This will mean additional funds released from receivables which may be alternatively used. At the same time the extending of discount period will result in later collecting of funds because those who were getting discount and making payments as per earlier schedule will also delay their payments. For example, if the firm allowing cash discount for payments within seven days now extends it to payments within fifteen days. There may be more customers availing discount and paying early but there will be those also who were paying earlier within seven days will now pay in fifteen days. It will increase the collection period of the concern. Hence, this decision involves matching of the effect on collection period with the increased cost associated with additional customers availing the discount.

2. EXECUTING CREDIT POLICY

After formulating the credit policy, is proper executing is very important. The evaluation of credit applications and finding out the credit worthiness of customers should be undertaken.

(a) Collecting Credit Information. The first step in implementing credit policy will be to gather credit information about the customers. This information should be adequate enough so that proper analysis about the financial position of the customers is possible. This type of investigation can be undertaken only upto to certain limit because it will involve cost. The cost incurred in collecting this information and the benefit from reduced bad debt losses will be compared. The credit information will certainly help in improving the quality of receivables but the cost of collecting information should not increase the reduction of bad debts losses.

The sources from which credit information will be available should be ascertained. The information may be available from financial statements, credit rating agencies, reports from banks, firm's records etc. Financial reports of the customer for a number of years will be helpful in determining the financial position and profitability position. The balance sheets will help in finding out the short term and long-term position of the concern. The income statements will show the profitably position of the concern. The income figures will help in finding out whether it is sufficient to enable the payment of receivables or other business liabilities or not. The liquidity position and current assets movement will help in

finding out the current financial position. A proper analysis of financial statements will be helpful in determining the creditworthiness of customers. There are credit rating agencies which can supply information about various concerns. These agencies regularly collect information about business units from various sources and keep this information up to date. The interpreted information can be had from these agencies. These agencies supply this information to their subscribers on a regular basis through circulars, periodicals etc. The information is kept in confidence and may be used when required. Such agencies are not available in India at present but countries like America have so many agencies in this field.

Credit information may be available with banks too. The banks have their credit departments to analyze the financial position of a customer. The bank in which one has its accounts can be helpful in supplying this information. If the customer is at a different place then the bank can collect this information through its branch at that place and bank may even request the other banks for information deposited, etc. may be helpful to know about the customers.

In case of old customers, business's own records may help to know their credit worthiness. The frequency of payments, cash discounts availed, interest paid on overdue payments etc., may help to form an opinion about the quality of credit. The salesman of the business may also be asked to collect information about the customers.

(b) Credit Analysis. After gathering the required information, the finance manager should analyse it to find out the credit worthiness of potential customers and also to see whether they satisfy the standards of the concern or not. The credit analysis will determine the degree of risk associated with the account, the capacity of the customer to borrow and his ability and willingness to pay.

(c) Credit decision. After analysing the creditworthiness of the customer, the finance manager has to take a decision whether the credit is to be extended and if yes, then up to what level. He will match the creditworthiness of the customer with the credit standards of the company. If customer's creditworthiness is above the credit standards then there is no problem in taking a decision. It is only in the marginal cases that such decisions are difficult to be made. In such cases the benefit of extending the credit should be compared to the likely bad debts losses and then a decision should be taken. In case the customer's are below the company's credit standards then they should not be out rightly refused. Rather they should be offered some alternative facilities. A customer may be offered to pay on delivery of goods, invoices may be sent through bank and released after collecting dues or some third party guarantee may be insisted. Such a course may help in retaining the

customers at present and their dealings may help in reviewing their requests at a later date.

(d) Financing Investments in Receivables and Factoring. Accounts receivables block a part of working capital. Efforts should be made that funds are not ties up in receivables for longer periods. The finance manager should make efforts to get receivables financed so that working capital needs are met in time.

The banks allow raising of loans against security of receivables. Generally, banks supply between 60 to 80 per cent of the amount of receivables as loans against their security. The quality of receivables will determine the amount of loan. The banks will accept receivables of dependable parties only. Another method of getting funds against receivables is their outright sale to the bank. The bank will credit the amount to the party after deducting discount and will collect the money from the customers later. Here too, the bank will insist on quality receivables only. Besides banks, there may be other agencies which can buy receivables and pay cash for them. This facility is known as factoring. The factor will purchase only the accounts acceptable to him and may refuse purchase in certain cases. The factoring may be with or without recourse. If it is without recourse then any bad debt loss is taken up by the factor but if it is with recourse then bad debts losses will be recovered from the seller. The factor may suggest the customer for whom he will extend this facility. The factoring service varies from bill discounting facilities offered by commercial banks to a total takeover of administration of the sales ledger and credit control functions.

3. Formulating and Executing Collection Policy

The collection of amounts due to customers is very important. The concern should devise procedure to be followed when accounts become due after the expiry of credit period. The collection policy be termed as strict and lenient.

FACTORING AND RECEIVABLES MANAGEMENT

A firm may avail the service of specialised institutions engaged in receivables management, called factoring firms.

A factor is a financial institution which offers services relating to management and financing of debts arising out of credit sales. Factoring may broadly be defined as the relationship, created by an agreement, between the seller of goods/services and a financial institution called the factor, whereby the later purchases the receivables of the former and also controls and administers the receivables of the former.

Functions of a Factor

Factors render a number of services to the selling firms. Some of the important services rendered or functions performed by a factor are as below:

(i) Bill discounting facilities
(ii) Administration of credit sales
(iii) Maintenance of sales ledger.
(iv) Collection of accounts receivables.
(v) Credit control
(vi) Protection from bad debts.
(vii) Provision of finance.
(viii) Rendering advisory services

Benefits of Factoring

A firm that enters into factoring agreement is benefited in a number of ways as it is relieved from the problem of collection management and it can concentrate on other important business activities. Some of the important benefits are outlined as under:

(a) It ensures a definite pattern of cash inflows from the credit sales.

(b) It serves as a source of short-term finance.

(c) It ensures better management of receivables as factor firm is a specialised agency for the same.

(d) It enables the selling firms to transfer the risk of non-payments, defaults or bad debts to the factoring firms in case of non-recourse activities.

(e) It relieves the selling firms from the burden of credit management and enables them to concentrate on other important business activities.

(f) It saves in cost as well as space as it is a substitute for in-house collection department.

(g) In provides better opportunities for working capital management.

(h) The selling firm is also benefited by advisory services rendered by a factor.

Problem 1. From the following information, calculate average collection period:

	Rs
Total Sales	1,00,000
Cash Sales	20,000
Sales Returns	7,000
Debtors at the end of the year	11,000
Bills Receivables	4,000
Creditors	15,000

Solution:

Average Collection Period

$$= \frac{\text{Trade Debtors} \times \text{No. of Working Days}}{\text{Net Credit Sales}}$$

Trade Debtors = Rs 11,000 + 4,000 = Rs 15,000

Net Credit Sales = Rs 1,00,000 - 20,000 - 7,000

= Rs 73,000

Hence, Average Collection Period $= \frac{15{,}000 \times 365}{73{,}000}$

Or, A.C.P = 75 days

Problem- 2. Dryson Ltd. provides the following information:

	Rs
Cash sales during the year	1,50,000
Credit sales during the year	2,70,000
Returns inward	20,000
Trade debtors in the beginning	55,000
Trade debtors at the end	45,000
Provision for bad and doubtful debts	5,000

Calculate:

(i) Debtors Turnover Ratio

Problem 3. The following are the details regarding the operation of a firm during a period of 12 months:

Sales	12,00,000
Selling price per unit	10
Variable cost per unit	7
Total cost per unit	9
Credit period allowed to customers	One month

The firm is considering a proposal for a more liberal credit by increasing the average collection period from one month to two months. This relaxation is expected to increase sales by 25%.

You are required to advise the firm regarding adopting of the new credit policy, presuming that the firm's required return on investment is 25 per cent.

Solution:

(i) Calculation of new average cost per unit after adopting new credit policy

Current sales	= Rs 12,00,000
Selling price per unit	= Rs 10
Number of units sold at present (12,00,000/10)	1,20,000
Current cost of sales (1,20,000 x 9)	Rs 10,80,000
Add: Cost of additional sales (30,000 x 7)	= Rs 2,10,000
Total cost for 1,50,000 units	= Rs 12,90,000
New average cost per unit (12,90,000/1,50,000)	Rs 8.60

(ii) Calculation of average additional investment in debtors

Current cost of sales	Rs 10,80,000
Current credit period = 1 month	
(a) Current investment in debtors (10,80,000 x 1/12)	= Rs 90,000
Proposed cost of sales for 1,50,000 units	= Rs 12,90,000
Proposed credit period = 2 months	
(b) Proposed investment in debtors (12,90,000 x 2/12)	= Rs 2,15,000
(c) Additional investment in debtors (b-a)	1,25,000

(iii) Calculation of profit on additional sales

Additional units sold x contribution per unit = 30,000 x 3	= Rs 90,000

(iv) Calculation of return on additional investment

$$= \frac{\text{Additional Profit}}{\text{Additional Investment}} \times 100 = \frac{90,000}{1,25,000} \times 100 = 72\%$$

Advice: As the required rate of return (25%) is much lower than the expected return on additional investment (72%), the proposal should be accepted.

Problem 4. A trader whose current sales are Rs 15 lakhs per annum and average collection period is 30 days wants to pursue a more liberal credit policy to improve sales. A study made by a consultant firm reveals the following information:

Credit policy	Increase in collection period	Increase in Sales
A	15 Days	Rs 60,000
B	30 Days	Rs 90,000
C	45 Days	Rs 1,50,000
D	60 Days	Rs 1,80,000
E	90 Days	Rs 2,00,000

The selling price per unit is Rs 5. Average cost per unit is Rs 4 band variable cost per unit is Rs 2.75. The required rate if return on additional investment is 20%. Assume 360 days in a year and also assume that there are no bad debts. Which of the above policies would you recommend for adoption?

Solution:

Statement of Evaluation of Different Credit Policies							
		Existing Policy		Proposed Policies			
		30 days	**A 45 days**	**B 60 days**	**C 75 days**	**D 90 days**	**E 120 days**
1	Sales revenue (Rs)	15,00,000	15,60,000	15,90,000	16,50,000	16,80,000	17,00,000
2	Selling price per unit	5	5	5	5	5	5
3	Number of units $(1 \div 2)$	3,00,000	3,12,000	3,18,000	3,30,000	3,36,000	3,40,000
4	Variable cost @ (Rs) 2.75 p.u. (Rs)	8,25,000	8,58,000	8,74,500	9,07,500	9,24,000	9,35,000
5	Fixed cost (Rs)	3,75,000	3,75,000	3,75,000	3,75,000	3,75,000	3,75,000
6	Total cost (4+5) (Rs)	12,00,000	12,33,000	12,49,500	12,82,500	12,99,000	13,10,000
7	Profit (1-6) (Rs)	3,00,000	3,27,000	3,40,500	3,67,500	3,81,500	3,90,000
8	Average debtors at cost (Rs) $\left(\frac{TotalCost}{360} \times Creditperiod\right)$	1,00,000	1,54,125	2,08,250	2,67,188	3,24,750	4,36,667
9	Required return on investment at 20% (Rs)	20,000	30.825	41,650	53,438	64,950	87,333
10	Net Profit (7-9) (Rs)	2,80,000	2,96,175	2,98,850	3,14,062	3,16,050	3,02,667
	Thus, policy D which gives the highest profit of Rs 3,16,050 should be adopted.						

CREDITORS/PAYABLES TURNOVER RATIO

Problem 5. From the following information calculate creditors turnover ratio and average payment period:

	Rs
Total Purchases	4,00,000
Cash purchases (included in above)	50,000
Purchases Returns	20,000
Creditors at the end	60,000
Bills Payable at the end	20,000
Reserve for discount on Creditors	5,000
Take 365 days in a year	5,000

Solution:

$$\text{Creditors Turnover Ratio} = \frac{\text{Annual Net Purchases}}{\text{Average Trade Creditors}}$$

Net Credit Purchases		Rs
Total Purchases		4,00,000
Less: Cash Purchases		50,000
		3,50,000
Less: Returns		20,000
		3,30,000

Creditors Turnover Ratio $= \frac{\text{Rs. } 3{,}30{,}000}{\text{Rs.}60{,}000 + \text{Rs.}20{,}000}$

(Trade creditors include creditors and bills payable) $= \frac{\text{Rs. } 3{,}30{,}000}{\text{Rs.}80{,}000} = 4.13 \text{ times}$

Average Payment Period $= \frac{\text{No. of days}}{\text{Creditors Turnover Ratio}}$

$= \frac{365}{4.13} = 88 \text{ days (approx)}$

Alternatively:

Average Payment Period $= \frac{60{,}000 + 20{,}000}{3{,}30{,}000} \times 365$

$= \frac{80{,}000}{3{,}30{,}000} \times 365 = 88 \text{ days}$

Review quetions

1. Write a note on factoring
2. What is the optimum level of receivables?

C. Essay Type Questions

1. What is 'receivables management'? How is it useful for business concerns?

2. What should be the considerations in forming a credit policy?

3. What do you understand by Receivables Management? Discuss the factors which influence the size of receivables.

4. Discuss the various aspects or dimensions of receivables management.

Exercise

1. A company sells goods on cash as well as on credit. The following particulars are extracted from their books of accounts:

	Rs
Gross Total Sales	4,00,000
Cash Sales	80,000
Sales Returns	28,000
Debtors at the end	36,000
Bills Receivable at the end	8,000
Provision for doubtful debts	3,000
Total Creditors at the end	25,000
Calculate Average Collection Period	
Take 365 days in a year	

(Ans. 55 days)

2. As a part of the strategy to increase sales and profits, the manager of a company proposes to sell goods to a group of new customers with 10% risk of non-payment. This group would require one and a half months credit and is likely to increase sales by Rs 1,00,000 p.a. Production and selling expenses amount to 80% of sales and the income-tax rate is 50%. The company's minimum required rate of return (after tax) is 25%.

(a) Should the sales manager's proposal be accepted?

(b) Also find the degree of risk of non-payment that the company should be willing to assume if the required rate of return (after tax) were (i) 30% (ii) 40% and (iii) 60%

(**Ans**. (a) Accepted as available rate of return is 50% (b) 14%: 12% and 8%)

A. A company currently has an annual turnover of Rs 10 lakhs and an average collection period of 45 days. The company wants to experiment with a more liberal credit policy on the ground that increase in collection period will generate additional sales. From the following information, kindly indicate which of the policies you would like the company to adopt:

Credit Policy	**Increase in collection Period**	**Increase in Sales**	**Percentage of Default**
1	15 days	50,000	2%
2	30 days	80,000	3%
3	40 days	1,00,000	4%
4	60 days	1,25,000	6%

The selling price of the product is Rs 5, average cost per unit at current level is Rs 4 and the variable cost per unit is Rs 3.

The current bad debt loss is 1% and the required rate of return on investment is 20%. A year can be taken to comprise of 360 days.

(**Ans.** Policy, 1, i.e. 60 days)

UNIT 8

COST OF CAPITAL

Learning Objectives

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

- The meaning, concept and significance of cost of capital
- Computation of cost of specific sources of finance
- Computation of weighted average cost of capital
- Marginal cost of capital
- Capital Asset Pricing Model for computing cost of equity.

COST OF CAPITAL: MEANING, CONCEPT AND DEFINITION

The items on the liability side of the balance sheet are called capital components. The major capital components are equity, preference and debt. Capital, like any other factor of production, has a cost. A company's cost of capital is the average cost of the various capital components (or securities) employed by it. Putting differently, it is the average rate of return required by the investors who provide capital to the company.

The cost of capital of a firm is the minimum rate of return expected by its investors. It is the weighted average cost of various sources of finance used by the firm, viz., equity, preference and debt. The concept of cost of capital is very important in financial management. It is used for evaluating investment projects, for determining capital structure, for assessing leasing proposals etc.

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

Solomon Ezra defines cost of capital as, "the minimum required rate of earnings or the cut-off rate of capital expenditures".

Thus, we can say that cost of capital is that minimum rate of return which a firm must, and is expected to earn on its investments so as to maintain the market value of its shares. Alternatively, cost of capital can be interpreted as the weighted average cost of various sources of finance used by the firm, i.e. equity, preference and debt capital.

Suppose that a accompany uses equity, preference and debt in the following proportions: 50:10:40.If the specific cost of equity, preference and debt are 16%, 12% and 8% respectively, the weighted average cost of capital (WACC) will be,

WACC =Proportion of equity x cost of equity +
Proportion of preference x cost of preference +

Proportion of debt x cost of debt

=(0.5x16) + (0.10x12) + (0.4x8) = 12.40%

If a firm's rate of return on its investments exceeds its cost of capital, it creates the economic profit or value for its investors, i.e. equity share holders.

For example, consider a firm which employs equity and debt in equal proportions, and whose cost of equity and debt are 14% and 6% respectively. The weighted average cost of capital works out to 10%. (0.5x14+0.5x6). If the firm invests Rs. 100 million on a project which earns a rate of return of 12%, the return on equity funds employed in the project will be:

$$\frac{\text{Total return on the project-Interest on debt}}{\text{Equity funds}} = \frac{100(0.12) - 50(0.06)}{50} = 18\%$$

Since 18% exceeds the cost of equity (14%), equity share holders benefit in the form of economic profit.

Significance of Cost of Capital

Cost of capital is a key concept in financial decision making. It is useful from the point of view of both investment as well as financing decisions. It further helps the management in taking so many other financial decisions.

1. *As an acceptance criterion in capital budgeting*

According to the present value method of capital budgeting, if the present value of expected returns from investments is greater than or equal to the cost of investment, the project may be accepted; otherwise, the project may be rejected. The present value of expected returns is calculated by discounting the expected cash inflows at cost of capital.

2. *As a determinant of capital mix in capital structure decision*

There should be a proper mix of debt and equity capital in financing a firm's assets. While designing an optional capital structure, the management has to keep in mind the objective of maximizing the value of the firm and minimizing the cost of capital.

3. *As a basis for evaluating the financial performance*

The actual profitability of a project is compared to the projected overall cost of capital and the actual cost of capital of funds raised. If the actual profitability of the project is more than the projected profitability and the actual cost of capital, the performance may be said to be satisfactory.

4. *As a basis for taking other financial decisions*

The cost of capital is also used in making other financial decisions such as dividend policy, capitalization of profits, right issues and working capital management.

Classification of Cost of Capital

Having understood the concept of cost of capital, let us see its classification now:

1. Historical cost and future cost

Historical costs are book costs related to the past or past cost. Future costs are estimated costs for the future. Historical costs act as a guide to the future costs.

2. Specific cost and composite cost

Specific cost refers to the cost of a specific source of capital. Composite cost is combined cost of various sources of capital. It is the weighted average cost of capital or the overall cost of capital which is considered in the capital structure decisions.

3. Explicit cost and implicit cost

Explicit cost is the internal rate of return which equals the present value of cash inflows with the present value of cash outflows.

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

4. Average cost and marginal cost

Average cost of capital refers to the combined cost of various sources of capital such as debentures, preference shares, equity shares and retained earnings. It is the weighted average cost of various sources of finance.

Marginal cost of capital refers to the average cost of capital to be incurred to obtain additional funds required by a firm.

Computation of Cost of Capital

Computation of overall cost of capital involves two stages:

A) Computation of specific cost of capital
B) Computation of weighted average cost of capital

First of all, we have to compute the cost of different sources of funds:

A) COMPUTATION OF SPECIFIC COST OF CAPITAL

Computation of cost of each specific source of finance, i.e. debt capital, preference share capital, equity share capital and retained earnings is discussed below:

1) Cost of Debt Capital

Debt capital may be redeemable debt or irredeemable debt.

1.1 **Cost of Irredeemable Debt or Perpetual Debt**:

Cost of debt is the rate of interest payable on debt capital. Calculation of cost of debt can be clear from the following example:

A company issues Rs. 1,00,000, 10% debentures at par. The before tax cost of this debt will be 10%.

i) Before tax cost of debt, $K_{db}=\frac{I}{P}$, where I= Interest and P= Principal

If the debt is raised at premium or discount, we should consider P as net proceeds received from the issue and not the face value of securities.

ii) $K_{db}=\frac{I}{NP}$, where NP= Net Proceeds.

Now, considering the tax implication of interest payments on debt capital, the effective cost of debt can be calculated as:

iii) $K_{da} = K_{db}(1-t)$ or $\frac{I}{NP}$ (1--t)

where, K_{da}= after tax cost of debt and t= rate of tax.

Problem 1:

a) X Ltd. issues Rs 50000, 8% debentures at par. The tax rate applicable to the company is 50%. Compute cost of debt capital.

b) Y Ltd. issues Rs 50000, 8% debentures at a premium of 10%. The tax rate applicable to the company is 60%. Compute cost of debt capital.

c) A Ltd. issues Rs 50000, 8% debentures at a discount of 5%. The tax rate applicable to the company is 50%. Compute cost of debt capital.

d) B Ltd issues Rs 100000, 9% debentures at a premium of 10%. The costs of floatation are 2%. The tax rate applicable is 60%. Compute cost of debt capital.

Solution:

a) $K_{da} = \frac{I}{NP}$ (1-t)

$$\frac{4000}{50000} \text{ (1-0.50)} = 4\%$$

b) $K_{da} = \frac{I}{NP}$ (1-t)

$$\frac{4000}{55000} \text{ (1-0.60)} = 2.91\%$$

c) $K_{da} = \frac{I}{NP}$ (1-t)

$$\frac{4000}{47500}\ (1\text{-}0.50) = 4.21\%$$

d) $K_{da} = \frac{I}{NP}\ (1\text{-}t)$

$$\frac{9000}{107800}\ (1\text{-}0.60) = 3.34\%$$

$$NP=1{,}00{,}000+10{,}000-(\frac{2}{100}\text{ x }1{,}10{,}000) = 1{,}10{,}000 - 2200 = 1{,}07{,}800$$

1.2 Cost of Redeemable debt

Debt capital issued which are to be redeemed after a certain period is known as redeemable debt. The cost of redeemable debt capital may be computed by using Yield to maturity, also called internal rate of return or trial and error method.

a) Yield to maturity or Trial and error method

i) Before tax cost of redeemable debt

$$V_0=\frac{I_1}{(1+K_d)^1}+\frac{I_2}{(1+K_d)^2}+\ldots+\frac{I_n}{(1+K_d)^n}+\frac{V_n}{(1+K_d)^n}$$

$$\text{Or, } V_0=\sum_{t=1}^{n}\frac{I_t}{(1+K_d)^t}+\frac{V_n}{(1+K_d)^n}$$

where, V_0= Current value or issue price of debt

V_n= Redeemable value of debt

$I_1, I_2 \ldots I_n$= Amount of annual interest in period 1, 2, …,n years.

n = Number of years to redemption

K_d= Yield to maturity or internal rate of return or cost of debt

The value of K_d (yield to maturity) can be found by trial and error method using present value tables.

ii) After tax cost of redeemable debt

$$K_{da} = K_{db}(1-t)$$

where, K_{da}= after tax cost of debt, K_{db}= before tax cost of debt and t= rate of tax.

Problem 2:

A five year Rs 100 debenture of a firm can be sold for a net price of Rs, 95.90. The coupon rate of interest is 14% per annum, and the debenture will be redeemed at 5%

premium on maturity. The firm's tax rate is 35%. Compute the yield to maturity and the after tax cost of debenture.

The present value factors (PVFs) at 15% and 17% are given below.

Year	1	2	3	4	5
P.V.F at 15%	0.870	0.756	0.658	0.572	0.497
P.V.F at 17%	0.855	0.731	0.624	0.534	0.456

Solution:

Computation of yield to maturity:

$$V_0 = \frac{I_1}{(1+K_d)^1} + \frac{I_2}{(1+K_d)^2} + \ldots + \frac{I_n}{(1+K_d)^n} + \frac{V_n}{(1+K_d)^n}$$

$$95.90 = \frac{14}{(1+K_d)^1} + \frac{14}{(1+K_d)^2} + \frac{14}{(1+K_d)^3} + \frac{14}{(1+K_d)^4} + \frac{14}{(1+K_d)^5} + \frac{105}{(1+K_d)^5}$$

By trial and error method using present value tables, we can find the value of $K_d = 16\%$.

Let us try 15%

14(0.870)+14(0.756)+14(0.658)+14(0.572)+14(0.497)+105(0.497)

12.180+10.584+9.212+8.008+6.958+52.185 =99.12

Since present value of rupee at 15% (99.12) is greater than the required present value (95.90), let us try higher rate of 17%.

14(0.855)+14(0.731)+14(0.624)+14(0.534)+14(0.456)+105(0.456)

11.970+10.234+8.736+7.476+6.384+47.88 =92.68

As present value at 17% (92.68) is less than the required present value (95.90); the discount rate or yield to maturity should be between 15% and 17%. At 15% the present value is 6.44 more than the required present value and at 17% present value is 3.22 less than the required present value; thus

$$K_d = 15\% + \left[(17\% - 15\%) * \frac{3.22}{6.44}\right] = 15\% + 1\% = 16\%$$

Computation of after-tax cost of debenture:

$$K_{da} = K_{db}(1 - t)$$

$$= 16(1 - 0.35) = 10.4\%$$

b) Shortcut method to compute cost of redeemable debt

Before-tax cost of redeemable debt

$$K_{db} = \frac{I+\frac{1}{n}*(RV-NP)}{\frac{1}{2}(RV+NP)}$$

where I= Annual interest

n = Number of years in which debt is to be redeemed

RV= Redeemable value of debt

NP= Net proceeds of debentures

After-tax cost of redeemable debt

$$K_{da} = \frac{I(1-t)+\frac{1}{n}*(RV-NP)}{\frac{1}{2}(RV+NP)}$$

where I= Annual interest

t =Tax rate

n = Number of years in which debt is to be redeemed

RV= Redeemable value of debt

NP= Net proceeds of debentures

Problem 3:

A company issues Rs, 10,00,000, 10% redeemable debentures at a discount of 5%. The costs of floatation amount to Rs. 30,000. The debentures are redeemable after 5 years. Calculate the before-tax and after-tax cost of debt assuming a tax rate of 50%.

Solution:

1) Before-tax cost of redeemable debt

$$K_{db} = \frac{I+\frac{1}{n}*(RV-NP)}{\frac{1}{2}(RV+NP)}$$

$$K_{db} = \frac{I,00,000+\frac{1}{5}*(10,00,000-9,20,000)}{\frac{1}{2}(10,00,000+9,20,000)}$$

[NP=I,00,000 − 50,000 (discount)-30,000 costs of floatation]

$$\frac{I,00,000+16,000}{9,60,000} = \frac{1,16,000}{9,60,000} = 12.08\%$$

2) After-tax redeemable debt

$$K_{da} = \frac{I(1\text{-}t)+\frac{1}{n}*(RV\text{-}NP)}{\frac{1}{2}(RV+NP)}$$

$$K_{da} = \frac{I,00,000(1\text{-}0.5)+\frac{1}{5}*(10,00,000\text{-}9,20,000)}{\frac{1}{2}(10,00,000+9,20,000)}$$

$$\frac{50,000+16,000}{9,60,000} = \frac{66,000}{9,60,000} = 6.875\%$$

Problem 4:

A five year Rs. 100 debenture of a firm can be sold for a net price of 96.50, The coupon rate of interest is 14% per annum, and the debenture will be redeemed at 5% premium on maturity. The firm's tax rate is 40%. Compute the after-tax cost of debenture.

Solution:

1) Before-tax cost of debt redeemable at premium

$$K_{db} = \frac{I+\frac{1}{n}*(RV\text{-}NP)}{\frac{1}{2}(RV+NP)}$$

$$= \frac{14+\frac{1}{5}*(105\text{-}96.50)}{\frac{1}{2}(105+96.50)} = \frac{15.70}{100.75} = 15.58\%$$

2) After-tax cost of debt redeemable at premium

$$K_{da} = \frac{I(1\text{-}t)+\frac{1}{n}*(RV\text{-}NP)}{\frac{1}{2}(RV+NP)}$$

$$= \frac{14(1\text{-}0.4)+\frac{1}{5}*(105\text{-}96.50)}{\frac{1}{2}(105+96.50)} = \frac{10.10}{100.75} = 10.025\%$$

Problem 5:

Assuming that a firm pays tax at 50% rate, compute the after-tax cost of debt capital in the following cases:

1) A perpetual bond sold at par, coupon rate of interest being 7%

2) A 10 year, 8% Rs 1000 per bond sold at Rs. 950 less 4% underwriting commission

Solution:

1) Cost of perpetual bond

$$K_{da} = \frac{I}{NP}(1-t)$$

$$= \frac{7}{100}(1-0.50) = 3.5\%$$

2) Cost of redeemable debt

$$K_{da} = \frac{I(1\text{-}t)+\frac{1}{n}(RV\text{-}NP)}{\frac{1}{2}(RV+NP)}$$

$$= \frac{80(1\text{-}0.5)+\frac{1}{10}(1000\text{-}912)}{\frac{1}{2}(1000+912)} = \frac{48.80}{956} = 0.0510 \text{ or } 5.1\%$$

Problem 6:

A company issues 9% irredeemable debentures of Rs 100 each for Rs 5,00,000. 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) at 5% discount and c) 10% premium.

Solution:

a) Issued at par

$$K_{db} = \frac{I}{NP}$$

$$= \frac{45,000}{5,00,000} = 0.09 = 9\%$$

$$K_{da} = \frac{I}{NP}(1-t)$$

$$= 9\%(1-0.40) = 5.4\%$$

b) Issued at 5% discount

$$K_{db} = \frac{45,000}{4,75,000} = 9.47\%$$

$$K_{da} = 9.47\%(1-0.40) = 5.68\%$$

c) Issued at 10% premium

$$K_{db} = \frac{45,000}{5,50,000} = 8.18\%$$

$$K_{da} = 8.18\%(1-0.40) = 4.91\%$$

Problem 7:

A company issues 10 year 9% debentures of Rs. 100 each at par for 5,00,000 and incures issue expenses at 2%. The company's tax rate is 40%. Calculate the effective cost of debt assuming that the debentures are redeemable a) at par b) at 5% discount and c) at 5% premium.

Solution:

d) Issued at par

$$K_{db} = \frac{I+\frac{1}{n}*(RV-NP)}{\frac{1}{2}(RV+NP)}$$

$$= \frac{45,000+\frac{1}{10}*(5,00,000-4,90,000)}{\frac{1}{2}(5,00,000+4,90,000)}$$

$$= \frac{45,000+1,000}{4,95,000} = 9.29\%$$

$$K_{da} = \frac{I(1-t)+\frac{1}{n}(RV-NP)}{\frac{1}{2}(RV+NP)}$$

$$= \frac{45,000(1-0.40)+\frac{1}{10}*(5,00,000-4,90,000)}{\frac{1}{2}(5,00,000+4,90,000)}$$

$$= \frac{27,000+1000}{4,95,000} = 5.65\%$$

1.3 Cost of existing debt

To calculate the cost of existing debt capital, the current market yield of the debt should be taken into consideration.

Example: A firm has 10% debentures of Rs. 100 each, outstanding on 1st January 2006 to be redeemed on 31st December 2012. New debentures could be issued at a net realizable price of Rs 90 in the beginning of 2008. Calculate the current cost of existing debt.

$$K_{db} = \frac{10 + \frac{1}{5}(100 - 90)}{\frac{1}{2}(100 + 90)} = \frac{12}{95} = 0.1263 \text{ or } 12.63\%$$

If the firm's tax rate is 40%, the after tax cost of debt will be,

$K_{da}=K_{db}(1\text{-}t)=12.63(1\text{-}0.40)=7.58\%$

1.4 Cost of zero coupon bonds

Zero coupon bonds or debentures are debentures issued at zero interest rate, at a discount from their maturity value. No interest is payable on such debentures, but at the time of redemption the maturity value of the bond is paid to the investors. The cost of such debt can be calculated by finding the present values of cash flows as shown in the example below:

Problem 8:

X Ltd. has issued redeemable zero coupon bonds of Rs. 100 each at a discount rate of Rs. 60, repayable at the end of 4th year. Calculate the cost of debt.

Solution:

Cash Flow Table at various assumed discount rates

Year	Cash flow	Discount factor At 12%	PVCF	Discount factor At 14%	PVCF
0	60	1	(60)	1	(60)
4	100	0.636	63.60	0.592	59.20
			3.60		-0.80

PVCF = Present Value of Cash Flow

The net present value of cash flow at 12% is Rs.3.60 and at 14% it is Rs.-0.80. It means that the cost of debt lies in between 12% and 14%. This can be precisely calculated by applying interpolation formula.

$$\text{Cost of debt} = \text{LR} + \frac{\text{NPV at LR}}{\text{PV at LR} - \text{PV at HR}} * (\text{HR} - \text{LR})$$

where LR = Low discount rate
HR = High discount rate
PV = Present value of cash inflow
NPV = Net present value = PV – Cash outflow

$$\text{Cost of debt } (K_{db}) = 12 + \frac{3.6}{3.6-(-0.8)} * (14 - 12)$$

$$= 12 + \frac{3.6}{4.4} * 2 = 12 + 1.64 = 13.64\%$$

3) COST OF PREFERENCE CAPITAL

Usually a fixed rate of dividend is payable on preference shares. The cost of preference capital is the function of dividend expected by the preference shareholders.

Preference share capital may be perpetual or redeemable.

Cost of perpetual preference share capital can be calculated as:

$$K_p = \frac{D}{P}$$

where K_p = Cost of preference capital

D = Annual preference dividend

P = Preference share capital (proceeds)

Further, if preference shares are issued at premium or discount or when floatation costs are incurred to issue preference shares, the face value of preference share capital has to be adjusted to find out the net proceeds from the issue of shares. Then cost of preference share capital would be:

$$K_p = \frac{D}{NP}$$

Where, NP= Net proceeds from issue of shares

No adjustment is needed for tax as dividends are not deductible in computation of tax.

Cost of redeemable preference share capital can be calculated as:

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

where K_{pr}= Cost of redeemable preference shares

D = Annual preference dividend

MV= Maturity value of preference shares

NP = Net proceeds of preference shares

Problem 9

A company issues 10,000, 10% preference shares of Rs. 100 each. Cost of issue is Rs. 2 per share. Calculate cost of preference capital, if these shares are issued a) at par b) at a premium of 10% and c) at a discount of 5%.

Solution:

Cost of preference capital, $K_p = \frac{D}{NP}$

a)

$$= \frac{1,00,000}{10,00,000\text{-}20,000} = \frac{1,00,000}{9,80,000} = 10.20\%$$

b)

$$= \frac{1,00,000}{10,00,000+1,00,000-20,000} = \frac{1,00,000}{10,80,000} = 9.26\%$$

c)

$$= \frac{1,00,000}{10,00,000-50,000-20,000} = \frac{1,00,000}{9,30,000} = 10.75\%$$

Problem 10:

A company issues 10,000, 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 capital.

Solution:

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

$$= \frac{1,00,000+\frac{10,50,000-9,80,000}{10}}{\frac{1}{2}(10,50,000+9,80,000)} = \frac{1,00,000+7,000}{10,15,000} = 10.54\%$$

Problem 11:

A company issues 1000, 7% preference shares of Rs. 100 each at a premium of 10%, redeemable after 5 years at par. Compute the cost of preference capital.

Solution:

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

$$\frac{7,000+\frac{1,00,000-1,10,000}{5}}{\frac{1}{2}(1,00,000+1,10,000)} = \frac{7,000-2,000}{1,05,000} = 4.76\%$$

Problem 12:

A preference share sold at Rs. 100 with 8% dividend and a redemption price of Rs.110, if the company redeems it in five years. Assuming that the company's tax rate is 50% , compute the after-tax cost of preference capital.

Solution:

Preference dividend is not a tax deductible item, as debt interest. Hence tax rate has no impact on the cost.

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

$$\frac{9+\frac{110-100}{5}}{\frac{1}{2}(110+100)}=\frac{9+2}{105}=10.48\%$$

4) COST OF EQUITY SHARE CAPITAL

Let us now see how the cost of equity is computed. Share holders invest money in equity shares on the expectation of getting dividend and the company must earn this minimum rate so that the market price of the shares remains unchanged. Hence, the cost of equity capital is a function of the expected return by its investors. It is the minimum rate of return expected by the equity shareholders though payment of dividend to equity is not a legal binding.

The cost of equity share capital can be computed in the following ways:

a) Dividend Yield Method or Dividend/Price Ratio Method

Cost of equity fresh issues:

$$K_e=\frac{D}{NP}$$

Cost of existing equity share capital:

$$K_e=\frac{D}{MP}$$

where K_e= Cost of equity capital
D = Expected dividend per share
NP = Net proceeds per share
MP= Market price per share

This method is suitable only when the company has stable earnings and stable dividend policy over a period of time.

Problem 13:

A company issues 1000 equity shares of Rs. 100 each at a premium of 10%. The company has been paying 20% dividend to equity shareholders for the past five years and expects to maintain the same in the future also. Compute the cost of equity capital. Will it make any difference if the market price of equity share is Rs. 160?

Solution:

$$K_e=\frac{D}{NP}$$

$$=\frac{20}{110}=18.18\%$$

If the market [rice of an equity share is 160,

$$K_e = \frac{D}{MP} = \frac{20}{160} = 12.50\%$$

b) Dividend Yield Plus Growth in Dividend Method

This method may be used to compute cost of equity capital, when the dividends of the firm are expected to grow at a constant rate of and the dividend-pay-out ratio is constant. Cost of equity,

$$K_e = \frac{D_1}{NP} + G = \frac{D_0(1+G)}{NP} + G$$

where K_e= Cost of equity (fresh issue)

D_1= Expected dividend per share at the end of the year

NP= Net proceeds per share

G = Rate of growth in dividends

D_0= Previous year dividend

To calculate cost of equity share capital, net proceeds (NP) in the above equation should be replaced by MP (Market price per share),

$$K_e = \frac{D_1}{MP} + G$$

Problem 14:

i) A company plans to issue 1000 new shares of Rs. 100 each at par. The floatation costs are expected to be 5% of the share price. The company pays a dividend of Rs. 10 per share initially and the growth in dividend is expected to be 5%. Compute cost of new issue of equity shares.

ii) If the current market price of an equity share is Rs. 150, calculate the cost of existing equity share capital.

Solution:

i)

$$K_e = \frac{D_1}{NP} + G$$

$$= \frac{10}{100\text{-}5} + 5\% = 10.53\% + 5\% = 15.53\%$$

ii)

$$K_e = \frac{D_1}{MP} + G$$

$$= \frac{10}{150} + 5\% = 6.67\% + 5\% = 11.67\%$$

Problem 15:

The shares of a company are selling at Rs. 40 per share, and it had paid a dividend of Rs. 4 per share. The investors market expects a growth rate of 5% per year.

i) Compute the company's equity cost of capital

ii) If the anticipated growth rate is 7% per annum, calculate the indicated market price per share

Solution:

i)

$$K_e = \frac{D_1}{MP} + G = \frac{D_0(1+G)}{NP} + G$$

$$= \frac{4(1+0.05)}{40} + 5\% = \frac{4.20}{40} + 5\% = 10.5\% + 5\% = 15.5\%$$

ii) $K_e = \frac{D_1}{MP} + G$

$$15.50\% = \frac{4(1.07)}{MP} + 7\%$$

$$15.50\% - 7\% = \frac{4.28}{MP}$$

$$MP = \frac{4.28}{8.50} = \text{Rs. } 50.35$$

c) Earnings Yield Method or Earnings Price Ratio

Under this method, the cost of equity is the discount rate that equals the present value of expected future earnings per share with the net proceeds (or current market price) of share.

$$K_e = \frac{EPS}{NP}$$

Where, EPS = Earnings per share

NP = Net Proceeds

Cost of existing capital:

$$K_e = \frac{EPS}{MPS}$$

Where, EPS = Earnings per share

MPS= Market price per share

Problem 16:

A firm is currently earning Rs.2,00,000 and its share is selling at 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:

The cost can be calculated using the earnings per share as the basis.

Earnings per share $= \frac{\text{Rs.2,00,000}}{10,000} = \text{Rs. } 20$

Net proceeds $= \text{Rs. } 180 - 10 = \text{Rs. } 170$

$K_e = \frac{EPS}{NP} = \frac{20}{170} = 0.1176 = 11.76\%$

Problem 17:

A firm is considering an expenditure of Rs.60 lakhs for expanding its operation. The relevant information is as follows:

Number of existing equity shares	10 lakhs
Market value of existing share	60
Net earnings	90 lakhs

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

Solution:

$K_e = \frac{EPS}{NP}$

EPS, or earnings per share $= \frac{\text{Rs.90,00,000}}{10,00,000} = \text{Rs. } 9$

$K_e = \frac{9}{60} = 0.15 = 15\%$

Cost of new equity capital:

$K_e = \frac{EPS}{NP} = \frac{9}{52\text{-}2} = 0.18 = 18\%$

d) Realized Yield Method

The Dividend yield method and Earnings yield method suffer from a serious drawback of estimating precisely future dividend expectations of the investors. The realized yield method takes into account the rate of return realized to the past along with the gain

realized at the time of sale of shares. Thus the cost of equity would be the realized rate of return by the shareholders.

e) 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 an additional premium for investing in a particular share. The risk premium includes the average return on the overall market portfolio and the beta factor (or risk) of the particular investment. The cost of equity under CAPM is:

$K_e=R_f+B_i(R_m-R_f)$

Where, R_f= Risk free rate of return (assured rate of return)

B_i= Beta of investment i

R_m= Average market return

Problem 18: The beta coefficient of A Ltd. is 1.40. The risk free rate of interest on Government securities is 7%. The expected rate of return on equity shares is 15%. Calculate the cost of equity based on CAPM.

Solution:

$K_e=R_f+B_i(R_m-R_f)$

$=7\%+1.4(5\%-7\%) = 7\%+11.2\% = 18.2\%$

Problem 19:

You are given the following facts about a firm

i) Risk-free rate of return is 11%

ii) Beta coefficient, B_i of the firm is 1.25

Compute the cost of equity capital using Capital Asset Pricing Model (CAPM) assuming a maximum return of 15% next year. What would be the cost of equity if B_i rises to 1.75?

Solution:

$K_e=R_f+B_i(R_m-R_f)$

When B_i is 1.25, $K_e=11\%+1.25(15\%-11\%)$

$=11\%+5\%=16\%$

When B_i is 1.75, $K_e=11\%+1.75(15\%-11\%)$

$=11\%+7\%=18\%$

5) COST OF RETAINED EARNINGS

Retained earnings are the funds accumulated by a company over a period by keeping part of profit undistributed. It is a major internal source of finance for expansion and diversification programs. Retained earnings are not cost free funds, though they are internally generated. The cost of retained earnings is an opportunity cost to be measured

in terms of income forgone by the shareholders that they could have earned by investing in some alternative opportunities. Hence, cost of retained earnings is almost equal to cost of equity. However, shareholders have to incur floatation costs for new investments and pay personal taxes on dividends received, which they need not pay when earnings are retained. Thus cost of retained earnings will be cheaper than cost of equity to the extent of personal tax rate and floatation costs.

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

Where, K_r= Cost of retained earnings

K_e = Cost of equity

f = Floatation costs like brokerage etc.

t = Personal tax rate

Problem 20:

A firm's K_e (return available to shareholders) is 15%, the average tax rate of shareholders is 40% and it is expected that 2% is brokerage cost that shareholders will have to pay while investing their dividends in alternative securities. What is the cost of retained earnings?

Solution:

Cost of retained earnings,

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

$=15\% (1-0.02)(1-0.40)$

$=15\% *0.98*0.6 = 8.82\%$

Problem 21:

A Ltd. is currently earning a net profit of Rs.60,000 per annum. The shareholder's required rate of return (K_e) is 15%. If earnings are distributed among the shareholders they can invest in securities of similar type carrying a return of 15% per annum. However, the shareholders will have to incur 2% brokerage charges for making new investment. They are also in 30% tax bracket. Compute the cost of retained earnings to the company.

Solution:

$Kr \quad =K_e(1-f)(1-t)$

$=15\% (1-0.02)(1-0.30)$

$=15\% *0.98*0.7=10.29\%$

Verification: suppose the company's payout ratio is 100%.

Dividends payable to the shareholders	=60,000
Less: Personal income tax@30%	=18,000
After tax dividend available	=42,000
Less: Brokerage @ 2%	= 840

Net amount available for investment =41,160

Shareholders can earn at 15% on Rs.41,160, i.e. Rs.6,174. This is the opportunity income forgone by the shareholders if the company retains Rs.60,000. Hence, the required return for Rs.60,000 is Rs.6,174 and the rate of return is 10.29% [i.e. (6,174/60,000)*100]. Hence, the required rate of return expected by the shareholders from the company is 10.29% which is considered as the cost of retained earnings.

B) WEIGHTED AVERAGE COST OF CAPITAL (WACC)

WACC is defined as the weighted average of the cost of various sources of funding. WACC is also known as overall cost of capital or composite cost of capital or average cost of capital. Once the specific cost of individual sources of finance is determined, we can compute the WACC by assuming weights to the specific sources in proportion of each source to the total capital structure. The weights may be given either by using the book value of the specific sources or the market value of the source. The market value weights are sometimes preferred to book value weights because the market value represents the true value of the investors. But it will be difficult to determine the market values because of frequent fluctuations. Hence, it is better to use the book value weights which is readily available.

WACC can be computed as follows:

$$K_o = \frac{\sum XW}{\sum W}$$

where K_o= WACC

X = Cost of specific source of fund

W= Weight in proportion of each source of fund

Problem 22:

A firm has the following capital structure and after-tax costs for the different sources of funds used:

Source of funds	Amount Rs.	Proportion %	After-tax cost %
Debt	15,00,000	25	5
Preference Shares	12,00,000	20	10
Equity Shares	18,00,000	30	12
Retained Earnings	15,00,000	25	11
Total	60,00,000	100	

You are required to compute the weighted average cost of capital.

Solution:

Computation of Weighted Average Cost of Capital

Source of funds	Proportion % (W)	Cost % (X)	Weighted cost % Proportion*Cost (XW)%
Debt	25	5	1.25
Preference Shares	20	10	2.00
Equity Shares	30	12	3.60
Retained Earnings	25	11	2.75
Weighted Average Cost of Capital			9.60%

Problem 23:

Excel limited has the following capital structure:

Rs. in lakhs

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

Capital sources	Market value Rs.in lakhs [a]	Weight% [b]	Cost [net of tax] % [c]	Weighted cost of Capital [b]x[c]%
Equity capital	80	8/15=53.33	18	9.60
Preference capital	30	3/15=20.00	15	3.00
Secured debt	40	4/15=26.67	14	3.73
Total	150	I=100		16.33

WACC of the company based on market value = 16.33%

WACC BASED ON BOOK VALUE

Capital sources	Book 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	I=100		16.78

WACC of the company based on book value = 16.78%

MARGINAL COST OF CAPITAL

Marginal cost of capital is the cost of additional funds to be raised. It is the weighted average cost of new capital calculated by using marginal weights of additional funds. In case a firm employs the existing proportion of capital structure and the component costs remain the same, the marginal cost of capital shall be equal to the weighted average cost of capital. But in practice, the marginal cost of capital shall not be equal to the WACC because of the changes in the proportions or the component costs of additional funds.

Problem 24:

A firm has the following capital structure and after-tax costs for different sources of funds used:

Source of funds	Amount Rs.	Proportion %	After-tax cost %
Debt	4,50,000	30	7
Preference Capital	3,75,000	25	10
Equity Capital	6,75,000	45	15
Total	15,00,000	100	

i) Calculate the weighted average cost of capital using book-value weights

ii) The firm wishes to raise further Rs.6,00,000 for the expansion of the project as below

Source of funds	Amount Rs.
Debt	3,00,000
Preference Capital	1,50,000
Equity Capital	1,50,000

Assuming the specific costs do not change, compute the weighted marginal cost of capital.

Solution:

i) **Computation of Weighted Average Cost of Capital (WACC)**

Sources of Funds	Proportion (%) (W)	After-tax cost (%) (X)	Weighted cost % (XW)
Debt	30	7	2.10
Preference capital	25	10	2.50
Equity capital	45	15	6.75
WACC			11.35%

ii) **Computation of Weighted Marginal Cost of Capital (WMCC)**

Sources of Funds	Proportion (%) (W)	After-tax cost (%) (X)	Weighted cost % (XW)
Debt	50	7	3.50
Preference capital	25	10	2.50
Equity capital	25	15	3.75
WMCC			9.75%

In the former pages we have seen the computation of specific cost of capital and then the overall cost of capital. Now let us try to solve some more problems.

Exercise Problems:

1. Define the concept of capital.
2. Explain the components of cost of capital.
3. What is the relevance of cost of capital in corporate investment and financing decisions?
4. Discuss briefly the different approaches to the computation of equity capital.
5. State how you determine the weighted average cost of capital of a firm. What weights should be used in its calculation?
6. How do you determine the cost of debt?

7. What is cost of retained earnings?
8. How do you calculate the cost of preference share capital?
9. Examine the problems in the determination of overall cost of capital.
10. A company issues Rs.10,00,000- 12% debentures of Rs.100 each. The debentures are redeemable after the expiry of fixed period of 7 years. The company is in 35% tax bracket.
    Required:
    i) Calculate the cost of debt after tax if debentures are issued at
        a) Par
        b) 10% discount
        c) 10% premium
    ii) If brokerage is paid at 2%, what will be the cost of debentures, if issue is at par?

    [**Ans**. (i)(a)7.8% (b)9.71% (c) 6.07%; (ii) 8.17%]

11. i) A company issues 1000, 10% preference shares of Rs.100 each at a discount of 5%. Costs of raising capital are Rs.2,000. Compute the cost of preference capital.
    ii) Assume that the firm pays tax at 50%.Cmpute the after-tax cost of capital of a preference share sold at Rs.100 with a 9% dividend and a redemption price of Rs.100, if the company redeems it in five years.
    [**Ans**. (i) 10.75%; (ii) 10.47%]
12. Your company's share is quoted in the market at Rs.20 currently. The company pays a dividend of Rs.1 per share and the investor's market expects a growth rate of 5%per year.
    a) Compute the company's equity cost of capital
    b) If the anticipated growth rate is 6% p.a., calculate the indicated market price per share
    c) If the company's cost of capital is 8% and the anticipated growth rate is 15% p.a., calculate the indicated market price if the dividend of Rs. 1 per share is to be maintained.

    [**Ans**. a) 10%; b) Rs.25; c) Rs.33.33]

13. Excel Industries Ltd. has assets of Rs.1,60,000 which have been financed with Rs.52,000 of debt and Rs.90,000 of equity and a general reserve of Rs.18,000. The firm's total profits after interest and taxes for the year ended 31st March, 2000 were Rs.13,500. It pays 8% interest on borrowed funds and is in the 50% tax bracket. It has 900 equity shares of Rs.100 each selling at a market price of Rs.120 per share. What is the weighted average cost of capital?

[**Ans**. 9.74%]

14. Calculate the weighted average cost of capital (before and after tax) from the following information. Assume that the tax rate is 55%.

Type of capital	Proportion in the new capital structure	Before-tax cost of capital
Equity capital	25%	24.44%
Preference capital	10%	27.29%
Debt capital	50%	7.99%
Retained earnings	15%	18.33%

[**Ans**. i) 15.58%; ii) 13.39%]

15. The capital structure of Bombay Traders Ltd. as on 31-3-2015 is as follows:

Source of funds	Amount Rs.Crores
Equity Capital: 100 lakhs equity shares of Rs.10 each	10
Reserves	2
14% Debentures of Rs.100 each	3

For the year ended 31-3-2015 the company has paid equity dividend at 20%. As the company is a market leader with good future, dividend is likely to grow by 5% every year. The equity shares are now treated at Rs. 80 per share in the stock exchange. Income tax rate applicable to the company is 50%.

Required:

a) The current weighted cost of capital
b) The company has plans to raise a further Rs.5 crores by way of long-term loan at 16% interest. When this takes place the market value of equity shares is expected to fall to Rs.50 per share. What will be the new weighted average cost of capital of the company?

[**Ans**. a) 7.4%; ii) 8.45%

UNIT – 9
CAPITAL STRUCTURE – PART - 1

Learning Objectives

- Distinguish between capitalisation, capital structure and financial structure
- Financial break even point
- Optimal capital structure
- Risk and return trade off

INTRODUCTION

In order to run and manage a company, funds are needed. Right from the promotional stage up to end, finance plays an important role in a company's life. If funds are inadequate, the business suffers and if the funds are not properly managed, the entire organization suffers. It is, therefore, necessary that correct estimate of the current and future need of capital be made to have an optimum capital structure which shall help the organisation to run its work smoothly and without any stress.

Estimation of capital requirements is necessary, but the formation of a capital structure is important. According to Gerstenberg, "Capital structure of a company refers to the composition or make-up of its capitalisation and it includes all long-term capital resources viz: loans, reserves, shares and bonds".

The capital structure is made up of debt and equity securities and refers to permanent financing of a firm. It is composed of long-term debt, preference share capital and shareholder's funds.

Capitalisation, Capital Structure and Financial Structure

The terms, capitalisation, capital structure and financial structure, do not mean the same. While capitalisation is a quantitative aspect of the financial planning of an enterprise, capital structure is concerned with the qualitative aspect. Capitalisation refers to the total amount of securities issued by a company while capital structure refers to the kinds of securities and the proportionate amounts that make up capitalisation. For raising long-term finances, a company can issue three types of securities viz. Equity shares, Preference Shares and Debentures. A decision about the proportion among these type of securities refers to the capital structure of an enterprise. Some authors on financial management define capital structure in a broad sense so as to include even the proportion of short-term debt. In fact, they refer to capital structure as financial structure. Financial structure means the entire liabilities side of the balance sheet. "Thus, financial structure,

generally, is composed of a specified percentage of short term debt, long-term debt and shareholder's funds.

Problem 1. Given the following information, you are required to compute *(i)* Capitalisation, *(ii)* Capital Structure, and *(iii)* Financial Structure:

Liabilities	Rs.
Equity Share Capital	10,00,000
Preference Share Capital	5,00,000
Long-term Loans and Debentures	2,00,000
Retained Earnings	6,00,000
Capital Surplus	50,000
Current Liabilities	1,50,000
	25,00,000

Solution:

(i) **Capitalisation refers to the total amount of securities issued by a company. It is computed as below:**

	Rs.
Equity Share Capital	10,00,000
Preference Share Capital	5,00,000
Long-term Loans and Debentures	2,00,000
Capitalisation	**17,00,000**
	=======

***(ii)* Capital structure which refers to the proportionate amount that makes up capitalisation is computed as below:**

	Rs.	**Proportion/Mix**
Equity Share Capital	10,00,000	58.82%
Preference Share Capital	5,00,000	29.41%
Long-term Loans and Debentures	2,00,000	11.77%
	---	---
	17,00,000	100%
	========	==========

Some authors include retained earnings and capital surplus also for the purpose of capital structure; in that case capital structure shall be:

	Rs.	**Proportion/Mix**
Equity Share Capital	10,00.00	42.55%
Preference Share Capital	5,0.000	21.28%
Long-term Loans and Debentures	2,00,000	8.51%

Retained Earnings	6,00,000	25.53%
Capital Surplus	50,000	2.13%
	---	---
	23,50,00	100%
	========	========

(iii) **Financial Structure refers to all the financial resources, short as well as long-term and is calculated as :**

	Rs.	**Proportion/Mix**
Equity Share Capital	10,00.00	40%
Preference Share Capital	5,00,000	20%
Long-term Loans and Debentures	2,00,000	8%
Retained Earnings	6,00,000	24%
Capital Surplus	50,000	2%
Current Liabilities	1,50,000	6%
	---	---
	25,00,000	100%
	========	=======

Forms/Patterns of Capital Structure

The capital structure of a new company may consist of any of the following forms:

a) Equity Shares only
b) Equity and Preferences Shares
c) Equity Shares and Debentures
d) Equity Shares, Preferences Shares and debentures

Importance of Capital Structure

The term 'Capital structure' refers to the relationship between the various long-term forms of financing such as debenture, preference share capital and equity share capital. Financing the firm's assets is a very crucial problem in every business and as a general rule there should be a proper mix of debt and equity capital in financing the firm's assets. The use of long-term fixed interest bearing debt and preference share capital along with equity shares is called **financial leverage or trading on equity.** The long-term fixed interest bearing debt is employed by a firm to earn more from the use of these sources than their cost so as to increase the return on owner's equity.

The impact of leverage on earnings per share (EPS) can be understood with the help of following example:

Problem 2. ABC Company has currently an all equity capital structure consisting of 15,000 equity shares of Rs.100 each. The management is planning to raise another Rs.25 lakhs to finance a major programme of expansion and is considering three alternative methods of financing:

i. To issue 25,000 equity shares of Rs.100 each.
ii. To issue 25,000, 8% debentures of Rs.100 each.
iii. To issue 25,000, 8% preference shares of Rs.100 each.

The company's expected earnings before interest and taxes will be Rs. 8 lakhs. Assuming a corporate tax rate of 50 per cent, determine the earnings per share (EPS) in each alternative and comment which alternative is best and why?

Solution:

(Rs. in lakhs)

	Alternative I Equity Financing	***Alternative II Debt Financing***	***Alternative III Preference shares Financing***
Earnings before Interest and Tax (EBIT)	8.00	8.00	8.00
Less Interest	-	2.00	-
Earnings after interest but before tax	8.00	6.00	8.00
Less Tax @ 50%	4.00	3.00	4.00
Earnings After Tax (EAT)	4.00	3.00	4.00
Less Preference Dividend	-	-	2.00
Earnings Available to Equity holders	4.00	3.00	2.00
Number of Equity Shares	40,000	15,000	15,000
	4,00,000 / 40,000	3,00,000 / 15,000	2,00,000 / 15,000
Earnings per Share (EPS)	Rs.10	Rs.20	Rs.13.33

Comments. As the earnings per share are highest in alternative II, *i.e.*, debt financing, the company should issue 25,000 8% debentures of Rs.100 each. It will

double the earnings of the equity shareholders without loss of any control over the company.

Problem 3. A Limited company has equity share capital of Rs. 5, 00,000 divided into shares of Rs.100 each. It wishes to raise further Rs. 3,00,000 for expansion cum modernisation plans. The company plans the following financing schemes:

a) All common stock
b) Rs.one lakh in common stock and Rs. two lakhs in debt @ 10% p.a.
c) All debts at 10% p.a.
d) Rs.one lakh in common stock and Rs. two lakh in preference capital with the rate of dividend at 8%.

The company's expected earnings before interest and tax (EBIT) are Rs.1,50,000. The corporate rate of tax is 50%. Determine the Earnings per share (EPS) in each plan and comment on the implications of financial leverage.

Solution:

	Plan I ***Rs.***	***Plan II*** ***Rs.***	***Plan III*** ***Rs.***	***Plan IV*** ***Rs.***
Earnings before interest and tax	1,50,000	1,50,000	1,50,000	1,50,000
Less: Interest	--	20,000	30,000	--
	1,50,000	1,30,000	1,20,000	1,50,000
Less: Tax @ 50%	75,000	65,000	60,000	75,000
Earnings after tax	75,000	65,000	60,000	75,000
Less: Preference dividend @ 8%	--	--	--	16,000
Earnings available for equity holders	75,000	65,000	60,000	59,000
No. of common shares	8,000	6,000	5,000	6,000
Earnings per share	Rs.9.375	Rs.10.83	Rs.12	Rs.9.83

Comments

In the four plans of fresh financing, Plan III is the most leveraged of all. In this case, additional financing is done by raising loans @ 10% interest. Plan II has fresh capital stock of Rs. one lakh while Rs. two lakhs are raised from loans. Plan IV does not have fresh loans but preference capital has been raised for Rs. two lakhs.

The earnings per share is highest in Plan III, i.e, R.12. This plan depends upon fixed cost funds and thus has benefited the common stock-holders by increasing their share in profits. Plan II is the next best scheme where EPS is Rs.10.83. In this case too Rs.2 lakhs are raised through fixed cost funds. Even Plan IV, where preference capital of Rs.2 lakhs is issued, is better than plan I where common stock of Rs.3 lakh is raised.

The analysis of this information shows that financial leverage has helped in improving earnings per share for equity shareholders. It helps to conclude that higher the ratio of debt to equity the greater the return for equity stockholders.

Impact of Leverage on Loss

If a firm suffers losses then the highly leveraged scheme will magnify the losses per share. This impact is discussed in the problem below:

Problem 4. Taking the figures in problem 3, the concern suffers a loss of Rs.70,000. Discuss the impact of leverage under all the four plans.

Solution

	Plan I ***Rs.***	***Plan II*** ***Rs.***	***Plan III*** ***Rs.***	***Plan IV*** ***Rs.***
Loss before interest and tax	-70,000	-70,000	-70,000	-70,000
Add: Interest	--	-20,000	-30,000	--
Loss after interest	-70,000	-90,000	-1,00,000	-70,000
No. of Equity (common) Shares	8,000	6,000	5,000	6,000
Loss per share	Rs. 8.75	Rs.15	Rs.20	Rs.11.67

Comments

The loss per share is highest in Plan III because it has the higher debt-equity ratio while it is lowest in Plan I because all additional funds are raised through equity capital. The leverage will have adverse impact on earning if the firm suffers losses because fixed cost securities will magnify the losses.

Problem 5. AB Ltd. needs Rs.10,00,000 for expansion. The expansion is expected to yield an annual EBIT of Rs.1,60,000. In choosing a financial plan, AB Ltd. has an objective of maximizing earnings per share. It is considering the possibility of issuing equity shares and raising debt of Rs.1,00,000 or Rs.4,00,000 or Rs. 6,00,000. The current market price per share is Rs.25 and is expected to drop to Rs.20 if the funds are borrowed in excess of Rs.5,00,000.

Funds can be borrowed at the rates indicated below:

Upto Rs.1,00,000 at 8%
Over Rs.1,00,000 upto Rs.5,00,000 at 12%
Over Rs.5,00,000 at 18%.

Assume a tax rate of 50 percent. Determine the EPS for the three financing alternatives and suggest the scheme which would meet the objective of the management.

Solution

	Alternatives		
	Plan I (Debt = Rs.1,00,000)	Plan II (Debt=Rs.4,00,000)	Plan III (Debt = Rs.6,00,000)
Earnings before interest and tax (EBIT)	1,60,000	1,60,000	1,60,000
Less: Interest	8,000	44,000	74,000
Earnings Before Tax (EBT)	1,52,000	1,16,000	86,000
Less: Tax @ 50%	76,000	58,000	43,000
Earnings after Tax (EAT)	76,000	58,000	43,000
Number of Shares =	$\frac{9,00,000}{25}$	$\frac{6,00,000}{25}$	$\frac{4,00,000}{20}$
=	36,000	24,000	20,000
Earnings Per Share $\left(\frac{\text{EAT}}{\text{No.of Shares}}\right)$	$\frac{76,000}{36,000}$	$\frac{58,000}{24,000}$	$\frac{43,000}{20,000}$
	= Rs.2.11	= Rs.2.42	= Rs.2.15

Suggestion: As the company has an objective of maximising earnings per share, alternative II, ie. raising a debt of Rs.4,00,000 and equity Rs.6,00,000 would meet the objective. The EPS is the highest under alternative II.

FINANCIAL BREAK-EVEN POINT

Financial breakeven point may be defined as that level of EBIT which is just equal to pay the total financial charges, *i.e*., interest and preference dividend. At this point or level of earnings before interest and tax, the earnings per share equal zero (EPS=0). It is a critical point in planning the capital structure of a firm. If earnings before interest and tax are less than the financial breakeven point, the earnings per share shall be negative and hence fixed interest bearing debt or preference share capital should be reduced in the capitalisation of the firm. However, in case the level of EBIT exceeds the financial breakeven point, more of such fixed cost funds may be inducted in the capital structure. The financial breakeven point can be calculated as below:

(a) When the capital structure consists of equity share capital and debt only and no preference share capital is employed:

Financial Break Even Point = Fixed interest charges

(b) When capital structure consists of equity share capital, preference share capital and debt:

$$\text{Financial Break Even Point} = I + \frac{D_P}{(1-t)}$$

Where, I = Fixed interest charges

D_P = Preference Dividend

t = Tax Rate

(As dividend on preference share capital is payable only out of earnings after tax)

Problem 6. A firm has two alternative plans for raising additional funds of Rs.10,00,000.

(i) Issue of 10,000 debentures of Rs. 100 each bearing 10% interest per annum.

(ii) Issue of 4,000 debentures of Rs 100 each bearing 10% interest per annum and balance by the issue of 12% preference shares.

You are required to calculate the financial Break Even Point for each plan assuming a tax rate of 50%.

Solution

Plan 1. As the firm employs only debt and not preference share capital the financial breakeven point shall be equal to the fixed interest charges; or

Financial Break Even Point = Fixed Interest Charges
= Rs.1,00,000

Plan 2. As the firm employs debt and preference share capital, the financial breakeven point can be calculated as:

$$\text{Financial Break Even Point} = I + \frac{D_P}{(1-t)}$$

$$= 40,000 + \frac{72,000}{(1-0.5)}$$

$$= 40,000 + 1,44,000$$

$$= \text{Rs. } 1,84,000$$

POINT OF INDIFFERENCE

The EPS, (earnings per share), 'equivalency point' or 'point of indifference' refers to that EBIT, (earnings before interest and tax), level at which EPS remains the same irrespective of different alternatives of debt-equity mix. At this level of EBIT, the rate of return on capital employed is equal to the cost of debt and this is also known as breakeven level of EBIT for alternative financial plans.

The equivalency or point of indifference can be calculated algebraically, as below:

$$\frac{(X - I_1)(1-T) - PD}{S_1} = \frac{(X - I_2)(1-T) - PD}{S_2}$$

Where, X = Equivalency Point or Point of Indifference or Break Even EBIT level.

I_1 = Interest under alternative financial plan 1.

I_2 = Interest under alternative financial plan 2.

T = Tax Rate

PD = Preference Dividend

S_1 = Number of equity shares or amount of equity share capital under alternative 1.

S_2 = Number of equity shares or amount of equity share capital under alternative 2.

The following illustrative example explains the calculation of point of indifference.

Problem 7. A project under consideration by your company requires a capital investment of Rs. 60 lakhs. Interest on term loan is 10% p.a. and tax rate is 50% Calculate the point of indifference for the project, if the debt-equity ratio insisted by the financing agencies is 2:1

Solution:

As the debt equity ratio insisted by the financing agencies is 2:1, the company has two alternative financial plans:

(i) Raising the entire amount of Rs. 60 lakhs by the issue of equity shares, thereby using no debt, and

(ii) Raising Rs. 40 lakhs by way of debt and Rs. 20 lakh by issue of equity share capital.

Calculation of point of indifference:

$$\frac{(X - I_1)(1 - T) - PD}{S_1} = \frac{(X - I_2)(1 - T) - PD}{S_2}$$

Where, X = Point of Indifference

I_1 = Interest under alternative 1, i.e., .0 (no debt component)

I_2 = Interest under alternative 2, i.e., $\frac{10}{100} x40 = 4$

T = Tax Rate i.e. 50% or .5

PD = Preference Dividend, i.e., 0 as there are no preference shares

S_1 = Amount of equity capital under alternative 1, i.e. 60

S_2 = Amount of equity capital under alternative 2, i.e. 20.

$$\frac{(X-0)(1-.5)-0}{60} = \frac{(X-4)(1-.5)-0}{20}$$

$$\frac{.5X}{60} = \frac{.5X-2}{20}$$

$$20\ (.5X) = 60\ (.5X\text{-}2)$$

$$10X = 30X - 120$$

$$X = 6$$

Thus, EBIT, earnings before interest and tax, at point of indifference is Rs. 6 lakhs. At this level (6 lakh) of EBIT, the earnings on equity after tax will be 5% p.a. irrespective of alternative debt-equity mix when the rate of interest on debt is 10% p.a.)

Problem 8. A new project under consideration requires a capital outlay of Rs. 600 lakhs for which the funds can either be raised by the issue of equity shares of Rs. 100 each or by the issue of equity shares of the value of Rs. 400 lakhs and by the issue of 15% loan of Rs. 200 lakhs. Find out the indifference level of EBIT, given the tax rate at 50%.

Solution

Indifference Level of EBIT:

$$\frac{(X - I_1)(1-T) - PD}{S_1} = \frac{(X - I_2)(1-T) - PD}{S_2}$$

$$\frac{(X-0)(1-0.5)-0}{600} = \frac{(X-30)(1-0.5)-0}{400}$$

or $\frac{0.5x}{600} = \frac{0.5x-15}{400}$

or $400(0.5x) = 600\ (0.5x-15)$

or $200x=300x-9{,}000$

or $100x = 9{,}000$

or $x = 90$

Thus, the indifferent level of EBIT is Rs. 90 lakhs. At this level of EBIT, the earnings per share (EPS) under both the plans would be the same.

OPTIMAL CAPITAL STRUCTURE

As discussed above, the capital structure decision can influence the value of the firm through the cost of capital and trading on equity or leverage. The optimum capital structure may be defined as "that capital structure of combination of debt and equity that leads to the maximum value of the firm" Optimal capital structure 'maximises the value of the company and hence the wealth of its owners and minimises the company's cost of capital' (Solomon, Ezra, The Theory of Financial Management). Thus, every firm should aim at achieving the optimal capital structure and then to maintain it.

The following considerations should be kept in mind while maximising the value of the firm in achieving the goal of optimum capital structure:

i. If the return on investment is higher than the fixed cost of funds, the company should prefer to raise funds having a fixed cost, such as debentures, loans and preference share capital. It will increase earnings per share and market value of the firm. Thus, a company should make maximum possible use of leverage.
ii. When debt is used as a source of finance, the firm saves a considerable amount in payment of tax as interest is allowed as a deductible expense in computation of tax. Hence, the effective cost of debt is reduced, called tax leverage. A company should, therefore, take advantage of tax leverage.

iii. The firm should avoid undue financial risk attached with the use of increased debt financing. If the shareholders perceive high risk in using further debt-capital, it will reduce the market price of shares.

iv. The capital structure should be flexible.

RISK-RETURN TRADE OFF

i) Financial Risk. The financial risk arises on account of the use of debt or fixed interest bearing securities in its capital. A company with no debt financing has no financial risk. The extent of financial risk depends on the leverage of the firm's capital structure. A firm using debt in its capital has to pay fixed interest charges and the lack of ability to pay fixed interest increases the risk of liquidation. The financial risk also implies the variability of earnings available to equity shareholders.

ii) Non-Employment of Debt Capital (NEDC) Risk. If a firm does not use debt in its capital structure, it has to face the risk arising out of non-employment of debt capital. The NEDC risk has an inverse relationship with the ratio of debt in its total capital. Higher the debt-equity ratio or the leverage, lower is the NEDC risk and vice-versa. A firm that does not use debt cannot make use of financial leverage to increase its earnings per share; it may also lose control by issue of more and more equity; the cost of floatation of equity may also be higher as compared to costs of raising debt.

Thus a firm has to a reach a balance (trade-off) between the financial risk and risk of non-employment of debt capital to increase its market value**.**

UNIT - 10

CAPITAL STRUCTURE – PART - 11

Learning Objectives

- Theories of capital structure
- Determine the point of indifference
- Factors determining the capital structure
- Capital gearing

THEORIES OF CAPITAL STRUCTURE

Different kinds of theories have been propounded by different authors to explain the relationship between capital structure, cost of capital and value of the firm. The main contributors to the theories are Durand, Ezra, Solomon, Modigliani and Miller.

The important theories are discussed below:

1. Net Income Approach
2. Net Operating Income Approach
3. The Traditional Approach
4. Modigliani and Miller Approach.

1. Net Income Approach: According to this approach, a firm can minimise the weighted average cost of capital and increase the value of the firm as well as market price of equity shares by using debt financing to the maximum possible extent. The theory propounds that a company can increase its value and decrease the overall cost of capital by increasing the proportion of debt in its capital structure. This approach is based upon the following assumptions:

i. The cost of debt is less than the cost of equity
ii. There are no taxes.
iii. The risk perception of investors is not changed by the use of debt.

The total market value of a firm on the basis of Net Income Approach can be ascertained as below:

$$V = S+D$$

Where, V = Total market value of a firm

S = Market value of equity shares

$$= \frac{\text{Earnings Available to Equity Shareholders (NI)}}{\text{Equity Capitalisation Rate}}$$

D = Market value of debt.

and, Overall Cost of Capital or Weighted Average Cost of Capital can be calculated as:

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

Problem 1: X Ltd. is expecting an annual EBIT of Rs. 1 lakh. The company has Rs. 4 lakhs in 10% debentures. The cost of equity capital or capitalisation rate is 12.5%. You are required to calculate the total value of the firm according to the Net Income Approach.

Solution:

Calculation of the Value of the Firm	Rs.
Net Income (EBIT)	1,00,000
Less: Interest on 10% Debentures of 4lakhs	40,000
Earnings available to equity shareholders	60,000
Market Capitalisation Rate	12.5%
Market Value of Equity (S) =60,000x $\frac{100}{12.5}$	4,80,000
Market Value of Debenture (D)	4,00,000

Value of the Firm (S+D)	8,80,000
	=======

Problem 2. (a) A company expects a net income of Rs.80,000. It has Rs. 2,00,000, 8% Debentures. the equity capitalisation rate of the company is 10% Calculate the value of the firm and overall capitalisation rate according to the Net Income Approach (ignoring income-tax).

(b) If the debenture debt is increased to Rs. 3,00,000, what shall be the value of the firm and the overall capitalisation rate?

Solution

(a) Calculation of the Value of the Firm	
	Rs.
Net Income	80,000
Less: Interest on 8% Debentures Rs.2,00,000	16,000
Earnings available to equity shareholders	64,000
Market Capitalisation Rate	10%
Market Value of Equity (S) =64,000x$\frac{100}{10}$	6,40,000
Market Value of Debenture (D)	2,00,000

Value of the Firm (S+D)	**8,40,000**
	=======
Calculation of Overall Capitalisation Rate	
Overall cost of Capital (K_o) = $\frac{\text{Earnings}}{\text{Value of the firm}}\left(\frac{\text{EBIT}}{\text{V}}\right)$ = $\frac{80,000}{8,40,000} x100 = 9.52\%$	
(b)Calculation of value of the firm if debenture debt is Raised to Rs. 3,00,000	
	Rs.
Net Income	80,000
Less: Interest on 8% Debentures Rs. 3,00,000	24,000
Earnings available to equity shareholders	56,000
Market Capitalisation Rate	10%
Market Value of Equity 56,000x$\frac{100}{10}$	5,60,000
Market Value of Debenture	3,00,000
Value of the Firm	8,60,000
Overall Capitalisation Rate = $\frac{80,000}{8,60,000} x100 = 9.30\%$	

Thus, it is evident that with the increase in debt financing the value of the firm has increased and the overall cost of capital has decreased.

2. **Net Operating Income Approach:** According to this approach, change in the capital structure of a company does not affect the market value of the firm and the overall cost of capital remains constant irrespective of

the method of financing. There is nothing as an optimal capital structure and every capital structure is the optimum capital structure. This theory presumes that:

i. the market capitalises the value of the firm as a whole;
ii. the business risk remains constant at every level of debt equity mix;
iii. there are no corporate taxes.

The value of a firm on the basis of Net Operating Income Approach can be determined as below:

$$V = \frac{EBIT}{K_0}$$

Where, V = Value of a firm

EBIT = Net operating income or Earnings before interest and tax

K_0 = Overall cost of capital

The market value of equity, according to this approach is the residual value which is determined by deducting the market value of debentures from the total market value of the firm.

S = V-D

Where, S = Market value of equity shares

V = Total market value of firm

D = Market value of debt

The cost of equity or equity capitalisation rate can be calculated as below:

Cost of Equity or Equity Capitalisation Rate (K_0) =

$$\frac{\text{Earnings After Interest and Before Tax}}{\text{Market Value of Firm - Market Value Debt}}$$ or

$$= \frac{EBIT - I}{V - D}$$

Problem 3. (a) A company expects a net operating income of Rs 1,00,000. It has Rs 5,00,000, 6% Debentures. The overall capitalisation rate is 10%. Calculate the value of the firm and the equity capitalisation rate (cost of equity) according to the Net Operating Income Approach.

(b) If the debenture debt is increased to Rs 7,50,000. What will be the effect on the value of the firm and the equity capitalisation rate?

Solution:

(a) Net Operating Income = Rs. 1,00,000

Overall cost of Capital = 10%

Market Value of the firm (V) = $\frac{\text{Net Operating Income}}{\text{Overall Cost of Capital}}\left(\frac{\text{EBIT}}{K_0}\right)$

= 1,00,000x $\frac{100}{10}$ = 10,00,000

Market Value of Firm	10,00,000
Less: Market Value of Debentures	5,00,000
Total Market Value of Equity	5,00,000

Equity Capitalisation Rate or cost of equity (K_e) =

$$\frac{\text{Earnings Available to Equiry Shareholders}}{\text{Total Market Value of Equity Shares}} \text{ or } \left(\frac{\text{EBIT - 1}}{\text{V - D}}\right)$$

Where, EBIT means Earnings before Interest and Tax

V is value of the firm

D is value of debt capital

I is interest on debt. $K_e = \frac{1,00,000 - 30,000}{10,00,000 - 5,00,000} x100 = \frac{70,000}{5,00,000} x100 = 14\%$

(b) If the debenture debt is increased to Rs. 7,50,000, the value of the firm shall remain unchanged at Rs.10,00,000. The equity capitalisation rate will increase as follows:

Equity Capitalisation Rate (K_e) = $= \frac{EBIT - I}{V - D} = \frac{1,00,000 - 45,000}{10,00,000 - 7,50,000} = \frac{55,000}{2,50,000}$

= 0.22 or 22%

3. The Traditional Approach:

The traditional approach, also known as *Intermediate approach*, is a compromise between the two extremes of net income approach and net operating income approach. According to this theory, the value of the firm can be increased initially or the cost of capital can be decreased by using more debt as the debt is a cheaper source of funds than equity. Thus, optimum capital structure can be reached by a proper debt-equity mix. Beyond a particular point, the cost of equity increases because increased debt increases the financial risk of the equity shareholders.

Problem 4. Compute the market value of the firm, value of shares and the average cost of capital from the following information:

	Rs
Net Operating income	2,00,000
Total Investment	10,00,000
Equity Capitalisation Rate:	
(a) If the firm uses no debt	10%
(b) If the firm uses Rs 4,00,000 debentures	11%
(c) If the firm uses Rs 6,00,000 debenture	13%

Assume that Rs 4,00,000 debentures can be raised at 5% rate of interest whereas Rs 6,00,000 debentures can be raised at 6% rate of interest.

Solution

Computation of Market Value of Firm, Value of Shares & The Average Cost of Capital			
	(a) No debt	*(b) Rs 4,00,000 5% Debentures*	*(c) Rs 6,00,00 6% Debentures*
Net Operating Income	Rs 2,00,000	Rs 2,00,000	Rs 2,00,000
Less: Interest i.e., Cost of debt		20,000	36,000
Earnings available to equity shareholders	Rs 2,00,000	Rs 1,80,000	Rs 1,64,000
Equity Capitalisation Rate	10%	11%	13%
Market Value of Shares	$2,00,000 \times \frac{100}{10}$ Rs 20,00,000	$1,80,000 \times \frac{100}{11}$ Rs 16,36,363	$1,64,000 \times \frac{100}{13}$ Rs 12,61,538
Market Value of Debt (Debentures)	-	4,00,000	6,00,000
Market Value of Firm	20,00,000	20,36,363	18,61,538
Average Cost of Capital	$\frac{2,00,000}{20,00,000} \times 100$	$\frac{2,00,000}{20,36,363} \times 100$	$\frac{2,00,000}{18,61,538} \times 100$
$\frac{\text{Earnings}}{\text{Value of the firm}}$ or $\frac{\text{EBIT}}{\text{V}}$	=10%	=9.8%	10.7%

Comments

It is clear from the above that if debt of 4,00,000 is used the value of the firm increases and the overall cost of capital decreases. But, if more debt is used to finance in place of equity, i.e., Rs 6,00,000 debentures, the value of the firm decreases and the overall cost of capital increases.

4, Modigliani and Miller Approach. M & M hypothesis is identical with Net Operating Income approach if taxes are ignored. However, when corporate taxes are assumed to exist, their hypothesis is similar to the Net Income Approach.

(a) In the absence of taxes. (Theory of Irrelevance) The theory proves that the cost of capital is not affected by changes in the capital structure or say that the debt-equity mix is irrelevant in the determination of the total value of a firm. The reason argued is that though debt is cheaper to equity, with increased used of debt as source of finance, the cost of equity increases. This increase in cost of equity offsets the advantage of the low cost of debt. Thus, although the financial leverage affects the cost of equity, the overall cost of capital remains constant. The theory emphasises the fact that a firm's operating income is a determinant of its total value.

The M & M approach is based upon the following assumptions:

i. There are no corporate taxes.
ii. There is a perfect market.
iii. Investors act rationally.
iv. The expected earnings of all the firms have identical risk characteristics.
v. The cut-off point of investment in a firm is capitalisation rate.
vi. 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.
vii. All earnings are distributed to the shareholders.

Problem 5. The following information is available regarding Mid Air Enterprises:

i. Mid Air currently has no debt, it is an all equity company;
ii. Expected EBIT = 24 lakhs. EBIT is not expected to increase overnight, so Mid Air is in no growth situation;
iii. There are no taxes, so T = 0 per cent;
iv. Mid Air pays out all its income as dividends;
v. If Mid Air begins to use debt, it can borrow at the rate k_d = 8 per cent. This borrowing rate is constant and it is independent of the amount of debt. Any

money raised by selling debt would be used to retire common stock, so Mid Air's assets would remain constant;

vi. The risk of Mid Air's assets, and thus its EBIT, is such that its shareholders require a rate of return K_{ez} = 12 per cent, if no debt is used.

Using MM Model without corporate taxes and assuming a debt of Rs 1 crore, you are required to:

a) Determine the firm's total market value;
b) Determine the firm's value of equity;
c) Determine the firm's leverage cost of equity.

Solution

(a) Firm's Total Market Value:

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

$$= \frac{24,00,000}{0.12} = \text{Rs.2crores}$$

(b) Firm's Market Value of Equity:

S = V-D

2 – 1 = Rs 1 crore

(c) Firm's Leverage Cost of Equity :

= Cost of Equity + (Cost of Equity – Cost of Debt)

= 12% + (12% - 8%)

= 16%

b) When corporate taxes are assumed to exist (Theory of Relevance): Modigliani and Miller, in their article of 1963 have recognized that the value of the firm will increase or the cost of capital will decrease with the use of debt on account of deductibility of interest charges for tax purpose. Thus, the optimum capital structure can be achieved by maximizing the debt mix in the equity of a firm.

According to the M & M approach, the value of a firm unlevered can be calculated as:

$$\text{Value of Unlevered Firm (Vu)} = \frac{\text{Earnings Before Interest \& Tax}}{\text{Overall Cost of Capital}} \text{ i.e.} \frac{EBIT}{K_0}((1-t)$$

and, the value of a Levered firms is: $V_L = V_u + tD$

Where , V_u is value of unlevered firm

and tD is the discounted present value of the tax savings resulting from the tax deductibility of the interest charges, t is rate of tax and D the quantum of debt used in the mix.

Problem 6. A company has earnings before interest and taxes of Rs. 1,00,000. It expects a return on its investment at a rate of 12.5%. You are required to find the total value of the firm according to the Miller-Modigliani theory.

Solution:

According to the M and M theory, total value of the firm remains constant. It does not change with the change in capital structure.

$$\text{Total value of firm, V} = \frac{\text{Earnings Before Interest \& Tax}}{\text{Overall Cost of Capital}} \text{ i.e.} \frac{\text{EBIT}}{K_0}$$

$$= \frac{1,00,000}{12.5} * 100 = Rs.8,00,000$$

Problem 7. There are two firms X and Y which are exactly identical except that X does not use any debt in its financing, while Y has Rs. 1,00,000 5% Debentures in its financing. Both the firms have earnings before interest and tax of Rs.25,000 and the equity capitalisation rate is 10%. Assuming the corporation tax of 50% calculate the value of the firm using M & M approach.

Solution:

The market value of firm X which does not use any debt

$$V_u = \frac{\text{EBIT}}{K_0}(1-t)$$

$$= \frac{25,000}{0.10} * 0.5 = \text{Rs.}1,25,000$$

The market value of Firm Y which uses debt financing of Rs. 1,00,000

$V_L = V_u + tD$

= Rs. 1,25,000 +0.5*1,00,000

= Rs. 1,25,000+50,000 =Rs. 1,75,000.

How Does the Arbitrage Process Work?

We have noticed in the above problem that the market value of the firm Y, which uses debt content in its capital structure, is higher than the market value of firm X which does not use debt content in its capital structure. According to M & M theory, this situation cannot remain for a long period because of the arbitrage process. As the investors in company Y can earn a higher rate of return on their investment with lower financial risk, they will sell their holding of shares in company X and invest the same in company Y. Further, as company X does not use any debt in its capital structure, the financial risk to the investors will be less, thus, they will engage in personal leverage by borrowing additional funds equivalent to their proportionate share in firm X's debt at the same rate of interest and invest the borrowed funds also in company Y. The arbitrage process will continue till the prices of shares of company X fall and that of company Y rise so as to make the market value of the two firms identical. However, in the arbitrage process, such investors who switch their holdings will gain. Problem 8, given below, illustrates the working of arbitrage process.

Problem 8. The following is the data regarding two companies 'A' and 'B' belonging to the same equivalent risk class.

	Company A	Company B
Number of ordinary shares	1,00,000	1,50,000
8% Debentures	50,000	-
Market Price per share	Rs 1.30	Rs.1.00
Profit before interest	Rs 20,000	Rs 20,000

All profits after paying debenture interest are distributed as dividends. You are required to explain how under Modigliani and Miller approach, an investor holding10% of shares in company 'A' will be better off in switching his holding to company 'B'.

Solution:

In the opinion of Modigliani & Millier, two identical firms in all respects except their capital structure cannot have different market values because of arbitrage process. In case two identical firms except for their capital structure have

different market values, arbitrage will take place and the investors will engage in 'personal leverage' as against the 'corporate leverage'. In the given problem, the arbitrage will work out as below:

1. The investor will sell in the market 10% shares in Company 'A' for Rs 13,000 $\left(\frac{10}{100} \text{x} 1{,}00{,}000 \text{x} 1.30\right)$

2. He will raise a loan of Rs 5000, ie., $\left(\frac{10}{100} \text{x} 50{,}000\right)$ to take advantage of personal leverage as against the corporate leverage as company 'B' does not use debt content in its capital structure.

3. He will buy 18,000 shares in company 'B' with the total amount realised from 1 and 2, i.e., Rs 13,000 plus Rs 5000. Thus he will have 12% of shares in company 'B'

The Investor will gain by switching his holding as below:

Present income of the investor in company 'A':	Rs,
Profit before interest of the company	20,000
Less: Interest on debentures (8%)	4,000
Profit after interest	16,000
Share of the investor =10% of Rs 16,000,ie.	1,600
Income of the Investor after switching holding to company 'B'	
Profit before interest for company 'B'	20,000
Less: Interest	Nil
Profit after interest	20,000
Share of the investor = 20,000 x $\frac{18{,}000}{1{,}50{,}000}$	2,400
Less: Interest paid on loan taken 8% of Rs 5000	400
Net income of the investor	2,000

As the net income of the investor in company 'B' is higher than the loss of income from company 'A', due to switching the holdings, the investor will gain in switching his holdings to company 'B'

FACTORS DETERMINING THE CAPITAL STRUCTURE

The capital structure of a concern depends upon a large number of factors such as:

1. Financial Leverage or Trading on Equity: The use of long-term fixed interest bearing debt and preference share capital along with equity share capital is called financial leverage or trading on equity.

2. Growth and Stability of Sales: The capital structure of a firm is highly influenced by the growth and stability of its sales. If the sales of a firm are expected to remain fairly stable, it can raise a higher level of debt.

3. Cost of Capital: Cost of capital refers to the minimum return expected by its suppliers. The capital structure should provide for the minimum cost of capital.

4. Risk: There are two types of risk that are to be considered while planning the capital structure of a firm viz., (i) business risk and (ii) financial risk. Business risk refers to the variability of earnings before interest and taxes. Business risk can be internal as well as external. Internal risk is caused due to improper product mix, non-availability of raw materials, incompetence to face competition, absence of strategic management etc. Internal risk is associated with the efficiency with which a firm conducts its operations within the broader environment thrust upon it. External business risk arises due to change in operating conditions caused by conditions thrust upon the firm which are beyond its control e.g., business cycles, governmental controls, changes in business laws, international market conditions, etc.

Financial risk refers to the risk of a firm that may not be able to cover its fixed financial costs. Financial risk is associated with the capital structure of a company. A company with no debt financing has no financial risk.

5. Cash Flow Ability to Service Debt: A firm which shall be able to generate larger and stable cash inflows can employ more debt in its capital structure as compared to the one which has unstable and lesser ability to generate cash inflows.

6. Nature and Size of a Firm: Nature and size of a firm also influence its capital structure. All public utility concern has different capital structure as compared to other manufacturing concern.

7. Control: Whenever additional funds are required by a firm, the management of the firm wants to raise the funds without any loss of control over the firm.

8. Flexibility: Capital structure of a firm should be flexible, i.e., it should be such as to be capable of being adjusted according to the needs of the changing conditions. It should be possible to raise additional funds, whenever the need be, without much of difficulty and delay.

9. Requirements of Investors: The requirements of investors are another factor that influences the capital structure of a firm. It is necessary to meet the requirements of both institutional as well as private investors when debt financing is used.

10. Capital Market Conditions (Timing): Capital market conditions do not remain the same forever. Sometimes there may be depression while at other times there may be boom in the market. The choice of the securities is also influenced by the market conditions.

11. Assets Structure. The liquidity and the composition of assets should also be kept in mind while selecting the capital structure.

12. Purpose of Financing: If funds are required for a productive purpose, debt financing is suitable and the company should issue debentures as interest can be paid out of the profit generated from the investment.

13. Period of Finance: The period for which the finances are required is also an important factor to be kept in mind while selecting an appropriate capital mix.

14. Costs of Floatation: Although not very significant, yet costs of floatation of various kinds of securities should also be considered while raising funds.

15. Personal Considerations: The personal considerations and abilities of the management will have the final say on the capital structure of a firm. Management which are experienced and are very enterprising do not hesitate to use more of debt in their financing as compared to the less experienced and conservative management.

16. Corporate Tax Rate: High rate of corporate taxes on profits compel the companies to prefer debt financing, because interest is allowed to be deducted while computing taxable profits. On the other hand, dividend on shares is not an allowable expense for that purpose.

17. Legal Requirements: The Government has also issued certain guidelines for the issue of shares and debentures. The legal restrictions are very significant as they lay down a framework within which capital structure decision has to be made.

PRINCIPLES OF CAPITAL STRUCTURE DECISIONS

The capital structure decisions are influenced by a variety of factors discussed above. From these factors, we can summarise the main principles of capital structure decisions as follows:

1. Cost Principle
2. Risk Principle
3. Control Principle
4. Flexibility Principle
5. Timing Principle

All these principles have already been explained while discussing factors determining the capital structure.

CAPITAL GEARING

The term 'capital gearing' refers to the relationship between equity capital (equity shares plus reserves) and long-term debt. In simple words, capital gearing means the ratio between the various types of securities in the capital structure of the company. A company is said to be in high-gear, when it has a proportionately higher/large issue of debentures and preference shares for raising the long-term resources, whereas low-gear stands for a proportionately large issue of equity shares. For example:

Extracts of Balance Sheets		
Liabilities	***A. Ltd.*** ***Rs***	***B. Ltd.*** ***Rs***
Equity Share Capital	4,00,000	6,00,000
10% Preference Share Capital	3,00,000	2,00,000
9% Debentures	3,00,000	2,00,000
	10,00,000	10,00,000

The total capitalisation of the above two companies is the same i.e., Rs. 10,00,000 for each company, but the capital structure differs. A Ltd. is high geared as the ratio of equity capital in the total capitalisation of the company is only 40%. But B Ltd. is low geared as its capital structure comprises of 60% of equity capital and only 40% of the fixed cost bearing securities.

FINANCIAL DISTRESS AND CAPITAL STRUCTURE (BANKRUPTCY AND AGENCY COSTS)

When a firm uses more and more of debt in its capital mix the financial risk of the firm increases. It may not be able to pay the fixed interest to the suppliers of data and they may force the firm to liquidate. The firm runs into the cost of financial distress and bankruptcy. The firm using more of equity may not have to face such bankruptcy cost because it may not pay dividends to the shareholders in

absence of sufficient profits. The bankruptcy costs include the direct costs of litigation and the cost of managing the firm in liquidation.

Further, when a firm raises debt the suppliers of debt put restrictive conditions in the loan agreement resulting into lesser freedom to the management in decision-making called **agency costs**.

PECKING ORDER THEORY

The Pecking Order Theory was first suggested by **Donaldson** in 1961 and it was modified by **Myers** in 1984 (Modified Pecking Order Theory). According to Donaldson's theory, a firm has well defined order of preference for raising finance. Whenever a firm needs funds, it will rely as much as possible on internally generated funds. If the internally generated funds are not sufficient to meet the financial requirements, it will move to debt in the form of term loans and then to non-convertible bonds and debentures, and then to convertible debt instruments, and then to quasi-equity instruments and after exhausting all other sources, it may finally move to raise finance through issue of new equity share capital.

Problem 9: The firm A and B are identical in all respects including risk factors except for debt equity mix. Firm A has issued 12% debentures of Rs 15 lakhs while B has issued only equity. Both the firms earn 30% before interest and taxes on their total assets of Rs 25 lakhs.

Assuming a tax rate of 50% and capitalisation rate of 20% for an all-equity company, you are required to compute the value of the two firms using (i) Net Income Approach, and (ii) Net Operating Income Approach.

Solution:

Computerisation of Total Value of the Firms		
(i) Net Income Approach	***Levered Firm A. Rs***	***Unlevered Firm B Rs***
EBIT, 30% on Rs 25,00,000	7,50,000	7,50,000
Less: Income on debentures	1,80,000	--
	5,70,000	7,50,000
Less: Tax at 50%	2,85,000	3,75,000
Earnings available for equity shareholders	2,85,000	3,75,000
Capitalized value of equity at 20% Firm A : 2,85,000 x $\frac{100}{20}$	14,25,000	--

Firm B : 3,75,000 x $\frac{100}{20}$	--	18,75,000
Add: Value of Debt	15,00,000	--
Total Value of Firm	29,25,000	18,75,000

***(ii)* Net Operating Income Approach:**

Value of Universal Firm B (V_u) = $\frac{EBIT(1-1)}{K_e}$

= $\frac{7,50,000(1-5)}{20\%}$

= Rs 18,75,000

Value of Levered Firm A (V_L) = V + M

= 18,75,000 + 5 x 15,00,000

= 18,75,000 + 7,50,000

= Rs 26,25,000

Note: According to Net Operating Income Approach, change in the capital structure of a company does not affect the market value of the firm and every capital structure is the optimum capital structure, provided there are no corporate taxes. However, when the corporate taxes are assumed to exist (as in the above illustration), the optimum capital structure can be achieved by maximising the debt mix in the equity of a firm.

Problem 10: A company's capital structure consists of the following:

Equity share of Rs 100 each	Rs 20 lakhs
Retained Earnings	Rs 10 lakhs
9% Preference Shares	Rs 12 lakhs
7% Debentures	Rs 8 lakhs

Total	Rs 50 lakhs

========

The company earns 12% on its capital. The income-tax rate is 50%. The company requires a sum of Rs 25 lakh to finance its expansion programme for which the following alternatives are available to it:

(i) Issue of 20,000 equity shares at a premium of Rs 25 per share
(ii) Issue of 10% preference shares
(iii) Issue of 8% debentures

It is estimated that the P/E ratios in the cases of equity, preference and debenture financing would be 21.4, 17 and 15.7 respectively.

Which of the three financing alternatives would you recommend and why?

Solution

Evaluation of Various Financing Alternatives			
	Alternative (i) (Equity Shares) (Rs)	***Alternative (ii) (10% Preference Shares) (Rs)***	***Alternative (iii) (8% Debentures) (Rs)***
Earnings Before Interest @ Tax (EBIT) (12% on Rs 75 lakhs)	9,00,000	9,00,000	9,00,000
Less: Interest on Old Debentures at 7%	56,000	56,000	56,000
	8,44,000	8,44,000	8,44,000
Interest on New Debentures at 8%	--	--	2,00,000
Earnings Before Tax After Interest	8,44,000	8,44,000	6,44,000
Less: Tax at 50%	4,22,000	4,22,000	3,22,000
	4,22,000	4,22,000	3,22,000
Less: Preference Dividend on Existing Shares at 9%	1,08,000	1,09,000	1,08,000
	3,14,000	3,14,000	2,14,000
Preferences Dividend on New Shares at 10%	--	2,50,000	--
Earnings for Equity Shareholders (a)	3,14,000	64,000	2,14,000

Number of Equity Shares (b)	40,000	20,000	20,000
Earnings per Share (c) = [a+b]	7.85	3.20	10.70
Price/Earning Ratio (d)	21.4	17.0	15.7
Market Price per Share (c x d)	167.99	54.00	167.99

Comments: Probable market price per share is the same in alternative (i) and (iii), but earnings per share (EPS) is highest in alternative (iii). Thus, alternative (iii), i.e., issue of 8% Debentures should be preferred.

Review Questions

Short Answer Type Questions

1. Define capital structure.
2. What is optimal capital structure?
3. Name various theories of capital structure.
4. What is capital gearing?
5. What is trading on equity?
6. Write a note on 'Arbitrage Process'.
7. Explain the term point of indifference.
8. What do you understand by bankruptcy costs and agency costs?

Essay Type Questions

1. What is meant by capital structure? What are the major determinants of capital structure?
2. Define capital structure. What should generally be the features of an appropriate capital structure?
3. Explain the meaning of the term capital structure and mention the factors affecting capital structure.
4. Give a critical appraisal of the traditional approach and the Modigliani-Millers approach to the problem of capital structure.
5. What do you understand by capital gearing? What is its significance? Discuss the effects of high and low gearing on the financial position of a company during various phases of trade cycle.
6. Explain the net income approach to capital structure planning and examine its rationality.

EXERCISES

1. ABC company has currently an ordinary share capital of Rs 25 lakhs, consisting of 25,000 shares of Rs 100 each. The management is planning to raise another Rs 20 lakhs to finance a major programme of expansion through one of four possible financial plans. The options are:

   (i) Entirely through ordinary shares.

   (ii) Rs 10 lakhs through ordinary shares and Rs 10 lakhs through long-term borrowing at 8% interest per annum.

   (iii) Rs 5 lakhs through ordinary shares and Rs 15 lakhs through long-term borrowing at 9% interest per annum.

   (iv) Rs 10 lakhs through ordinary shares and Rs 10 lakhs through preference shares with 5% dividend.

   The company's expected earnings before interest and taxes (EBIT) will be Rs 8 lakhs. Assuming a corporate tax rate of 50%, determine the earnings per share in each alternative and comment which alternative in the best and why?

   [Ans: (i) Rs 8.88; (ii) Rs 10.29; (iii) Rs 11.07; (iv) Rs 10.00; Plan III is the best].

2. XY Ltd. needs Rs 50,00,000 for the installation of a new factory, the new factory is expected to yield annual Earnings Before Interest and Tax (EBIT) of Rs 10,00,000. In choosing a financial plan, XY Ltd. has an objective of maximising earnings per share. It is considering the possibilities of issuing ordinary shares and raising debt of Rs 5,00,000 at Rs 20,00,000 or Rs 30,00,000. The current market price per share is Rs300 and is expected to drop to Rs 250 if the funds are borrowed in excess of Rs 20,00,000. Funds can be raised at the following rates:

   Upto Rs 5,00,000 at 10%

   Over Rs 5,00,000 to Rs 20,00,000 at 15%

   Over Rs 20,00,000 at 20%

   Assuming a tax rate of 50%, advise the company.

[Ans: I. Rs 51.67; II. Rs 36.25; III. Rs 32.81].

The second alternative which gives the highest earnings per share is the best. Hence, the company is advised to raise Rs 20,00,000 through debt and Rs 30,00,000 by ordinary share.

3. A company is planning an expansion program which will require Rs 60 crore and can be funded through one of the three following options:

   1. Issue further equity shares of Rs 100 each at par.

   2. Raise a 15% loan.

   3. Issue 12% preference shares.

   The present paid up capital is Rs 120 crores and the annual EBIT is Rs 24 crores. The tax rate may be taken at 50%. After the expansion plan is adopted, the EBIT is expected to be Rs 30 crores.

   Calculate the EPS under all the three financing options indicating the alternative giving the highest return to equity shareholders. Also determine the indifference point between the equity share capital and debt financing (i.e., option 1 and option 2 above).

   [Ans: EPS : Option 1 Rs 8.33; Option 2 Rs 8.75; Option 3 Rs 6.50; Option 2 gives the highest return; indifference point between option 1 and 2 Rs 27 crores].

4. (a) A company is expecting an annual earnings before interest and tax (EBIT) of Rs 5,00,000. The company in its capital structure has 12%. Debentures of Rs 15,00,000. The cost of equity or capitalisation rate is 16%. You are required to calculate the value of the firm and overall cost of capital according to the Net Income Approach.

   (b) If the firm decides to raise further Rs 10,00,000 by the issue of debentures and to use the proceeds thereof to redeem equity shares, what shall be the value of the firm and overall capitalisation rate according to NI Approach.

   [Ans: (i) Rs 35,00,000; 14.28%

   (ii) Rs 37,50,000; 13.33%]

5. XYZ Ltd. expects earnings before interest and tax of Rs 6,00,000 and belongs to risk class of 10%. You are required to calculate the value of the firm and cost of equity capital (according to the NOI approach) if it employs 8% debt to the extent of 20%, 40% or 60% of the total financial requirement of Rs 30,00,000.

   [Ans: (a) 20% Debt: Value of Firm Rs 60,00,000; Cost of Equity 10.222%.

   (b) 40% Debt: Value of Firm Rs 60,00,000; Cost of Equity 10.50%

   (c) 60% Debt: Value of Firm Rs 60,00,000; Cost of Equity 10.857%].

6. The following is the data regarding two Companies 'X' and 'Y' belonging to the same equivalent risk class:

	Company X	***Company Y***
Number of ordinary shares	90,000	1,50,000
Market price per share	Rs 1.20	Re.1.00
6% Debentures	60,000	--
Profit before interest	Rs 18,000	Rs 18,000

   All profits after debenture interest are distributed as dividends.

   You are required to explain how under Modigliani & Miller approach, an investor holding 10% of shares in Company 'X' will be better off in switching his holding to Company 'Y'.

   [Ans: Present Income = 1440

   Income after switching holdings - Rs 1656].

7. Firms X and Y identical are except that firm X is not levered while Firm Y is levered. The following data relate to them:

	Firm X Rs	***Firm Y Rs***
Assets	5,00,000	5,00,000
Debt capital	0	2,50,000 (9% int.)
Equity share capital	5,00,000	2,50,000
No. of shares	(50,000)	(25,000)
Rate of Return on assets	20%	20%

Calculate EPS for both firms, assuming tax rate of 50%. Will it be advantageous to firm Y to raise the level of debt capital to 75%?

[Ans: EPS: Firm X Re.1.00; Firm Y Rs 1.55. Advantageous for firm Y to raise level of debt to 75%, as EPS increases to Rs 2.65].

8. A Company Ltd., has a share capital of Rs 1,00,000 dividend into shares of Rs 10 each. It has major expansion programme requiring an investment of another Rs 50,000. The management is considering the following alternatives for raising this amount:

(i) Issue of 5,000 shares of Rs 10 each.

(ii) Issue of 5,000, 12% preference shares of Rs 10 each.

(iii) Issue of 10% debentures of Rs 50,000.

The company's present earnings before interest and Tax (EBIT) is Rs 30,000 p.a.

You are required to calculate the effect of each of the above modes of financing on the earnings per share (EPS), presuming.

(a) EBIT continues to be the same even after expansion.

(b) EBIT increases by Rs 10,000.

(c) Assume tax liability at 50%.

[Ans: (a) E.P.S. : Plan I Re.1.00; Plan II Re.0.90; Plan III Rs 1.25

(b) E.P.S. : Plan I Rs 1.33; Plan II Rs 1.40; Plan III Rs 1.75].

9. Paramount Produces Ltd. wants to raise Rs 100 lakhs for a diversification project. Current estimate of earnings before interest and taxes (EBIT) from the new project is Rs 22 lakhs per annum.

Cost of debt will be 1.5% for amounts upto and including Rs 40 lakhs, 16% for additional amounts up to and including Rs 50 lakhs and 18% for additional amounts above Rs 50 lakhs.

The equity shares (face value Rs 10) of the company have a current market value of Rs 40. This is expected to fall to Rs 32 if debts exceeding Rs 50 lakhs are raised.

The following options are under consideration of the company:

Option	Equity	Debt
I	50%	50%
II	60%	40%
III	40%	60%

Determine the earning per share (EPS) for each option and state which option the company should exercise. Tax rate applicable to the company is 50%.

[Ans: EPS: Option 1 Rs 5.76; Option II Rs 5.33; Option III Rs 5.04; First Option should be exercised].

UNIT-11
DIVIDEND POLICY

Learning Objectives

- Mechanics and practice of dividend payment
- Factors affecting dividend policy
- Legal framework of payment of dividend
- Dividend theories
- Determinants of dividend policy

INTRODUCTION

The term dividend refers to that part of profits of a company which is distributed among its shareholders. It is a reward to the shareholders for their investments in the shares of the company. The investors are interested in earning the maximum return on their investments and to maximise their wealth. A company, on the other hand, needs to provide funds to finance its long-term growth. The firm's decision to pay dividends must be reached in such a manner so as to equitably apportion the distributed profits and retained earnings.

Dividend Decision and Valuation of Firms

The value of the firm can be maximised if the shareholders' wealth is maximised. There are conflicting views regarding the impact of dividend decision on the valuation of the firm. According to one school of thought, dividend decision does not affect the share-holders' wealth and hence the valuation of the firm. On the other hand, according to the other school of thought, dividend decision materially affects the shareholders' wealth and also the valuation of the firm. The views of the two schools of thought are discussed below under two groups:

1. The Irrelevance Concept of Dividend or the Theory of Irrelevance, and
2. The Relevance Concept of Dividend or the Theory of Relevance.

1. The Irrelevance Concept of Dividend or the Theory of Irrelevance:

A. Residual Approach

According to this theory, dividend decision has no effect on the wealth of the shareholders or the prices of the shares, and hence it is irrelevant so far as the valuation of the firm is concerned. The decision to pay dividends or retain the earnings may be taken as a residual decision. This theory assumes that investors do not differentiate between dividends and retentions by the firm. Their basic desire is to earn higher return on their investment. Thus, a firm should retain the earnings if it has profitable investment opportunities otherwise it should pay them as dividends.

B. Modigliani and Miller Approach (MM Model)

Modigliani and Miller have expressed in the most comprehensive manner in support of the theory of irrelevance. They maintain that dividend policy has no effect on the market price of the shares and the value of the firm is determined by the earning capacity of the firm or its investment policy. The splitting of earnings between

retentions and dividends, may be in any manner the firm likes, does not affect the value of the firm.

Assumptions of MM Hypothesis

The argument given by MM in support of their hypothesis is that whatever increase in the value of the firm results from the payment of dividend, will be exactly off set by the decline in the market price of shares because of external financing and there will be no change in the total wealth of the shareholders, it will have to raise additional funds from external sources. This will result in the increase in number of shares or payment of interest charges, resulting in fall in the earnings per share in the future. Thus whatever a shareholder gains on account of dividend payment is neutralised completely by the fall in the market price of shares due to decline in expected future earnings per share. To be more specific, the market price of a share in the beginning of a period is equal to the present value of dividends paid at the end of the period plus the market price of the shares at the end of the period. This can be put in the form of the following formula:

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

Where P_0 = Market price per share at the beginning of the period, or prevailing market price of a share

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

P_1 = Market price per share at the end of the period.

k_e = Cost of equity capital or rate of capitalisation.

The value of P_1 can be derived by the above equation as under:

$P_1 = P_0(1+k_e)-D_1$

The MM hypothesis can be explained in another form also presuming that investment required by the firm on account of payment of dividends is financed out of the new issue of equity shares.

In such a case, the number of shares to be issued can be compared with the help of the following equation:

$$m = \frac{I(E - {}_n D_1)}{P_1}$$

Further, the value of the firm can be ascertained with the help of the following formula:

$${}_n P_0 = \frac{(n+m)P_1 - (I - E)}{I + k_e}$$

Where, m = number of shares to be issued

I = Investment required

E = Total earnings of the firm during the period.

P_1 = Market price per share at the end of the period

K_e = Cost of equity capital.

n = number of shares outstanding at the beginning of the period.

D_1 = Dividend to be paid at the end of the period

${}_nP_0$ = Value of the firm

Let us take the following problem to show MM hypothesis of irrelevance of dividend to the valuation of firm.

Problem 1. ABC Ltd. belongs to a risk class for which the appropriate capitalisation rate is 10%. It currently has outstanding 5,000 shares selling at Rs.100 each. The firm is contemplating the declaration of dividend of Rs.6 per share at the end of the current financial year. The company expects to have a net income of Rs.50,000 and has a proposal for making new investment of Rs.1,00,000. Show that under the MM hypothesis, the payment of dividend does not affect the value of the firm.

(A) Value of the firm when dividends are paid:

(i) Price of the share at the end of the current financial year

$P_1 = P_0 (1+ke)-D_1$

$= 100(1+.10)-6$

$= 100 \times 1.10-6$

$= 110-6=Rs.104$

(ii) Number of shares to be issued

$$m = \frac{1(E-{}_nD_1)}{P_1}$$

$$= \frac{1{,}00{,}000-(50{,}000-5{,}000x6)}{104}$$

$$\frac{80{,}000}{104}$$

(iii) Value of the firm

$${}_nP_0 = \frac{(n+m)P_1-(I-E)}{1+ke}$$

$$= \frac{\left(5{,}000+\frac{80{,}000}{104}\right)\times 104-(1{,}00{,}000-50{,}000)}{1+.10}$$

$$= \frac{\left(\frac{5{,}20{,}000+80{,}000}{104}\right)\times\frac{104}{1}-(50{,}000)}{1.10}$$

$$= \frac{6{,}00{,}000-50{,}000}{1.10}$$

$$= \frac{5{,}50{,}000}{1.10} = Rs.5{,}00{,}000$$

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

(i) Price per share at the end of the current financial year

$P_1 = P_0 (I+ke)-D_1$

$= 100 (1+10)$

$= 100 \times 1.10 = Rs.110$

(ii) Number of shares to be issued

$$m = \frac{1(E-{}_nD_1)}{P_1}$$

$$= \frac{1{,}00{,}000 - (50{,}000 - 0)}{110}$$

$$= \frac{50{,}000}{110}$$

(iii) Value of the firm

$${}_nP_0 = \frac{(n+m)P_1 - (I-E)}{I+ke}$$

$$= \frac{\left(5{,}000 + \frac{50{,}000}{110}\right)\times 1.10 - (1{,}00{,}000 - 50{,}000)}{1+.10}$$

$$= \frac{\left(\frac{5{,}50{,}000 + 50{,}000}{110}\right)\times \frac{110}{1} - 50{,}000}{1.10}$$

$$= \frac{6{,}00{,}000 - 50{,}000}{1.10}$$

$$= \frac{5{,}50{,}000}{1.10} = Rs.5{,}00{,}000$$

Hence, whether dividends are paid or not, the value of the firm remains the same Rs.5,00,000.

Criticism of MM Approach

MM hypothesis has been criticised on account of various unrealistic assumptions as given below.

1. Perfect capital market does not exist in reality
2. Information about the company is not available to all the persons.
3. The firms have to incur flotation costs while issuing securities

4. Taxes do exit and there is normally different tax treatment for dividends and capital gains.
5. The firms do not follow a rigid investment policy.
6. The investors have to pay brokerage, fees, etc. while doing any transaction.
7. Shareholders may prefer current income as compared to further gains.

2. The Relevance Concept of Dividend or the Theory of Relevance

The other school of thought on dividend decision holds that the dividend decisions considerably affect the value of the firm. The advocates of this school of thought include Myron Gordon, Jone Lintner, James Walter and Richardson. According to them dividends communicate information to the investors about the firms' profitability and hence dividend decision becomes relevant. Those firms which pay higher dividends will have greater value as compared to those which do not pay dividends or have a lower dividend payout ratio.

(i) Walter's Approach and (ii) Gordon's Approach

(i) Walter's Approach

Prof. Walter's approach supports the doctrine that dividend decisions are relevant and affect the value of the firm. The relationship between the internal rate of return earned by the firm and its cost of capital is very significant in determining the dividend policy to sub serve the ultimate goal of maximising the wealth of the shareholders. Prof. Walter's model is based on the relationship between the firm's (i) return on investment, i.e., r, and (ii) the cost of capital or the required rate of return, i.e., k.

According to Prof. Walter, If r > k, i.e., if the firm earns a higher rate of return on its investment than the required rate of return, the firm should retain the earnings. Such firms are termed as growth firms and the optimum pay-out would be zero in their case. This would maximise the value of shares.

In case of declining firms which do not have profitable investments, i.e., where r < k, the shareholders would stand to gain if the firm distributes its earnings. For such firms, the optimum pay-out would be 100% and the firms should distribute the entire earnings as dividends.

In case of normal firms where r = k, the dividend policy will not affect the market value of shares as the shareholders will get the same return from the firm as expected by them. For such firms, there is no optimum dividend pay-out and the value of the firm would not change with the change in dividend rate.

Assumption of Walter's Model

(i) The investments of the firm are financed through retained earnings only and the firm does not use external sources of funds.

(ii) The internal rate (r) and the cost of capital (k) of the firm are constant.

(iii) Earnings and dividends do not change while determining the value.

(iv) The firm has a very long life.

Walter's Formula for Determining the Value of a Share

Walter has developed a mathematical equation to ascertain the market price of a share which enables a firm to arrive at the appropriate dividend decision. His equation is based on the following share valuation model:

$$P = \frac{D}{k_e - g}$$

Where, P = Price of equity share
D = Initial dividend per share
k_e = Cost of equity capital
g = Expected growth rate of earnings/dividend

Prof. Walter has given the following formula to ascertain the market price of a share:

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

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

P = Market price per share
D = Dividend per share
r = Internal rate of return
E = Earnings per share
k_e = Cost of equity capital

Let us take the following problem to understand the above equation

Problem 2. The following information is available for Awadh Corporation:

Earnings per share	Rs. 4.00
Rate of return on investments	18 %
Rate of return required by shareholder	15 %

What will be the price per share as per the Walter's Model if the pay-out ratio is 40 %?,
50%? and 60%?

Solution:

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

(i) Price per share if the payout ratio is 40%

$$P = \frac{1.60 + \frac{0.18}{0.15}(4-1.60)}{0.15}$$

$$= \frac{1.60 + 1.20(2.4)}{0.15}$$

$$= \frac{1.60 + 2.88}{0.15} = \frac{4.48}{0.15}$$

= Rs. 29.86

(ii) When payout ratio is 50%

$$p = \frac{2 + \frac{0.18}{0.15}(4-2)}{0.15}$$

$$= \frac{2 + 1.2(2)}{0.15}$$

$$= \frac{2 + 2.4}{0.15} = \frac{4.4}{0.15}$$

= Rs. 29.33

(iii) When payout ratio is 60%

$$P = \frac{2.40 + \frac{0.18}{0.15}(4-2.40)}{0.15}$$

$$= \frac{2.4 + 1.2(1.6)}{0.15}$$

$$= \frac{2.4 + 1.92}{0.15}$$

$$= \frac{4.32}{0.15}$$

= Rs. 28.80

Problem 3. The following information is available in respect of a firm:
Capitalisation rate = 10%
Earnings per share = Rs. 50
Assumed rate of return on investments:

(i) 12%
(ii) 8%
(iii) 10%

Show the effect of divided policy on market price of shares applying Walter's formula when dividend pay-out ratio is (a) 0% (b) 20% (c) 40% (d) 80% (e) 100%
Solution:

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

Effect of dividend policy on market price of shares

(i) r = 12% (ii) r = 8% (iii) r = 10%

(a) When dividend pay-out ratio is 0%

$$P = \frac{0}{.10} + \frac{.12(50-0)/.10}{.10} \qquad P = \frac{0}{.10} + \frac{.08(50-0)/.10}{.10} \qquad P = \frac{0}{.10} + \frac{.10(50-0)/.10}{.10}$$

$$= 0 + \frac{\frac{.12}{.10}(50)}{.10} \qquad = 0 + \frac{\frac{.08}{.10}(50)}{.10} \qquad = 0 + \frac{\frac{.10}{.10}(50)}{.10}$$

= Rs. 600 = Rs. 400 = Rs. 500

(b) When dividend pay-out is 20%

$$P = \frac{10}{.10} + \frac{\frac{.12}{.10}}{.10}(50-10) \qquad P = \frac{10}{.10} + \frac{\frac{.08}{.10}(50-10)}{.10} \qquad P = \frac{10}{.10} + \frac{\frac{.10}{.10}(50-10)}{.10}$$

$$= 100 + \frac{48}{.10}$$

= 100+320 = 100+400

= Rs. 580 = Rs. 420 = Rs. 500

(c) When dividend pay-out is 40%

$$P = \frac{20}{.10} + \frac{\frac{.12}{.10}}{.10}(50-20) \qquad P = \frac{20}{.10} + \frac{\frac{.08}{.10}(50-20)}{.10} \qquad P = \frac{20}{.10} + \frac{\frac{.10}{.10}(50-20)}{.10}$$

$$= 200 + \frac{36}{.10}$$

= 200+240 = 200+300

= Rs. 560 = Rs. 440 = Rs. 500

(d) When dividend pay-out is 80%

$$P = \frac{40}{.10} + \frac{\frac{.12}{.10}}{.10}(50-40) \qquad P = \frac{40}{.10} + \frac{\frac{.08}{.10}(50-40)}{.10} \qquad P = \frac{40}{.10} + \frac{\frac{.10}{.10}(50-40)}{.10}$$

= 400+120 = 400+80 = 400+100

= Rs. 520 = Rs. 480 = Rs. 500

(e) When dividend pay-out is 100%

$$P = \frac{50}{.10} + \frac{\frac{.12}{.10}(50-50)}{.10} \qquad P = \frac{50}{.10} + \frac{\frac{.08}{.10}(50-50)}{.10} \qquad P = \frac{50}{.10} + \frac{\frac{.10}{.10}(50-50)}{.10}$$

= 500+0 = 500+0 500+0

= Rs. 500 = Rs. 500 = Rs. 500

Conclusion: From the above analysis we can draw the conclusion that when,

(i) r > k, the company should retain the profits, i.e., when r = 12%, k_e = 10%

(ii) r is 8%, i.e., r < k, the pay-out should be high; and

(iii) r is 10%, i.e., r = k; the dividend pay-out does not affect the price of the share.

GORDON'S APPROACH

Myron Gordon has also developed a model on the lines of Prof. Walter suggesting that dividends are relevant and the dividend decision of the firm affects its value. His basic valuation model is based on the following assumptions:

(i) The firm is an all equity firm

(ii) No external financing is available or used. Retained earnings represent the only source of financing investment programmes.

(iii) The rate of return on the firm's investment r, is constant.

(iv) The retention ratio, b, once decided upon is constant, thus, the growth rate of the firm g = br, is also constant.

(v) The cost of capital for the firm remains constant and it is greater than the growth rate, i.e., k > br.

(vi) The firm has perpetual life.

(vii) Corporate taxes do not exist.

According to Gordon, the market value of a share is equal to the present value of future stream of dividends. Thus,

$$P = \frac{D_1}{(1+k)} + \frac{D_2}{(1+k)^2} + \text{.....}$$

$$= \sum_{t=1}^{a} \frac{D_t}{(1+k)^t}$$

Gordon's basic valuation formula can be simplified as under:

$$P = \frac{E(1-b)}{k_e - br}$$

or $$P_0 = \frac{D_1}{k_e - g} = \frac{D_0(1+g)}{k_e - g}$$

where,

P = Price of shares
E = Earnings per share
b = retention ratio
k_e = Cost of equity capital
br = g = Growth rate in r, i.e., rate of return on investment of an all-equity firm
D_0 = Dividend per share
D_1= Expected dividend at the end of year 1.

The implications of Gordon's basic valuation model may be summarised as below:

1. When the rate of return of firm on its investment is greater than the required rate of return, i.e., when r > k, the price per share increases as the dividend pay-out ratio decreases. Thus, growth firm should distribute smaller dividends and should retain maximum earnings.
2. When the rate of return is equal to the required rate of return, i.e., when r=k, the price per share remains unchanged and is not affected by dividend policy. Thus, for a normal firm there is no optimum dividend pay-out.
3. When the rate of return is less than the required rate of return, i.e., when r < k, the price per share increases as the dividend pay-out ratio increases. Thus, the shareholders of declining firm stand to gain, if the firm distributes its earnings. For such firms, the optimum payout would be 100%.

Problem 4. The following information is available in respect of the rate of return on investment, the cost of capital (k) and earnings per share (E) of ABC Ltd.

Rate of return on investment (r) = (i) 15%; (ii) 12%; and (iii) 10%

Cost of capital (k) = 12%

Earnings per share (E) = Rs.10

Determine the value of its shares using Gordon's Model assuming the following:

	D/p ratio (1-b)	**Retention ratio (b)**
(a)	100	0
(b)	80	20
(c)	40	60

Solution:

$$P = \frac{E(1-b)}{k_e - br}$$

Dividend Policy and the Value of Shares

i) R = 15% (r > k) (ii) r=12% (r=k) (iii) r=10% (r<k)

(a) When D/p ratio is 100% or b =0

$$P = \frac{10(1-0)}{0.12-(0)(0.15)} = \frac{10}{0.12} = \frac{10}{0.12} = \text{Rs. } 83.33$$

$$P = \frac{10(1-0)}{0.12-(0)(0.12)} = \frac{10}{0.12} = \text{Rs. } 83.33$$

$$P = \frac{10(1-0)}{0.12-(0)(0.10)} = \text{Rs. } 83.33$$

(b) When D/p ratio is 80% or b=.20

$$P = \frac{10(1-0.20)}{0.12-(0.20)(0.15)} = \frac{8}{0.09} = \frac{8}{0.10} = \text{Rs. } 88.89$$

$$P = \frac{10(1-0.20)}{0.12-(0.20)(0.12)} = \frac{8}{0.096} = \text{Rs. } 83.33$$

$$P = \frac{10(1-0.20)}{0.12-(0.20)(0.10)} = \text{Rs. } 80$$

(c) When D/p ratio is 40% or b=60

$$P = \frac{10(1-0.60)}{0.12-(0.60)(0.15)} = \frac{4}{0.03} = \frac{4}{0.06} = \text{Rs. } 133.33$$

$$P = \frac{10(1-0.60)}{0.12-(0.60)(0.12)} = \frac{4}{0.048} = \text{Rs. } 83.33$$

$$P = \frac{10(1-0.60)}{0.12-(0.60)(0.10)} = \text{Rs. } 66.67$$

Gordon's Revised Model

The basic assumption in Gordon's Basic Valuation Model that cost of capital (k) remains constant for a firm is not true in practice. Thus, Gordon revised his basic model to consider risk and uncertainly. In the revised model, he suggested that even when r=k, dividend policy affects the value of shares on account of uncertainty of future, shareholders discount future dividends at a higher rate than they discount near dividends.

Problem 5. The following information is available in respect of return on investment (r), the cost of capital (k_e) and earnings per share (E) of XYZ Ltd.

r = 10 %

E = Rs.40

Determine the value of its shares using Gordon's Model, assuming the following:

	D/p ratio (1-b)	**Retention ratio (b)**	**Cost of equity (ke)%**
(a)	20	80	20
(b)	40	60	18
(c)	60	40	16
(d)	80	20	14

Solution:

$$P = \frac{E(1-b)}{k_e - br}$$

Where P = Price of shares

E = Earnings per share

b = Retention Ratio

k_e = Cost of equity capital

br =g=growth rate in r, i.e., rate of return on investment of an all-equity firm

Dividend Policy and Value of Shares of XYZ Ltd.

(a) D/p ratio =20 (b) D/p ratio =40 (c) D/p ratio =60 (d) D/p ratio=80

Retention ratio= 80 Retention ratio=60 Retention=40 Retention=20

br = 0.8 x 0.10=0.08 br = 0.6 x 0.10=0.06 br = 0.4 x 0.10=0.04 br = 0.2 x 0.10=0.02

$P = \frac{40(1-0.8)}{0.20 - 0.08}$ $P = \frac{40(1-0.6)}{0.18 - 0.06}$ $P = \frac{40(1-0.4)}{0.16 - 0.04}$ $P = \frac{40(1-0.2)}{0.14 - 0.02}$

$= \frac{40(0.2)}{0.12}$ $= \frac{40(0.4)}{0.12}$ $= \frac{40(0.6)}{0.12}$

$= \frac{40(0.8)}{0.12}$

$= \frac{8}{0.12}$ $= \frac{16}{0.12}$ $= \frac{24}{0.12}$

$= \frac{32}{0.12}$

= Rs. 66.67 = Rs. 133.33 = Rs200 = Rs266.67

Problem 6. A Company is expected to pay a dividend of Rs.6 per share next year. The dividends are expected to grow perpetually at a rate of 9 %. What is the value of its share if the required rate of return is 15%?

Solution:

$$P_0 = \frac{D_1}{k_e - g}$$

$$= \frac{6}{0.15 - 0.09} = \frac{6}{.06} = Rs.100$$

Problem 7. The current price of a company's share is Rs.75 and dividend per share is Rs.5. Calculate the dividend growth rate, if its capitalisation rate is 12 %.

Solution:

$$P = \frac{D_1}{k_e - g} = \frac{D_0(1+g)}{k_e - g}$$

$$75 = \frac{5(1+g)}{0.12 - g}$$

$9.0 - 75g = 5 + 5g$

$-80g = -4$

$$g = \frac{-4}{-80} = 0.05 \text{ or } 5\%$$

Problem 8. The current price of a company's share is Rs.200. The company is expected to pay a dividend of Rs.5 per share next year with an annual growth rate of 10 %. If an investor's required rate of return is 12% should he buy the share?

Solution:

Value of the share,

$$P_0 = \frac{D_1}{k_e - g}$$

$$= \frac{5}{0.12 - 0.10}$$

$$= \frac{5}{0.02} = Rs.250$$

As the value of share is more than its current price of Rs. 200, the investor should buy the share.

Problem 9. The book value per share of a company is Rs.145.50 and its rate of return on equity is 10 %. The company follows a dividend policy of 60% pay-out. What is the price of its share if the capitalisation rate is 12 %?

Solution:

Earnings per share (EPS) $= 145.50 \times \frac{10}{100} = \text{Rs.}14.55$

Dividend per share (D_1) $= 14.55 \times \frac{60}{100} = \text{Rs.}\,8.73$

Growth in dividend (g) $= 0.1 \times \frac{40}{100} = \text{Rs.}0.04$

Price of the Share $P_0 = \frac{D_1}{k_e - g}$

$$= \frac{8.73}{0.12 - 0.04}$$

$$= \frac{8.73}{0.08} = \text{Rs.}109.13$$

DETERMINANTS OF DIVIDEND POLICY

The following are the important factors which determine the dividend policy of a firm:

1. Legal Restrictions. Legal provisions relating to dividends as laid down in sections 93, 205, 205A, 206 and 207 of the Companies Act, 1956 are significant because they lay down a framework within which dividend policy is formulated.

2. Magnitude and Trend of Earnings. The amount and trend of earnings is an important aspect of dividend policy. It is rather the starting point of the dividend policy.

3. Desire and Type of Shareholders. The directors should give the importance to the desires of shareholders in the declaration of dividends as they are the representatives of shareholders. Desires of shareholders for dividends depend upon their economic status.

4. Nature of Industry. Nature of industry to which the company is engaged also considerably affects the dividend policy. Certain industries have a comparatively steady and stable demand irrespective of the prevailing economic conditions.

5. Age of the Company. The age of the company also influences the dividend decision of a company. A newly established concern has to limit payment of dividend and retain substantial part of earnings for financing its future growth and development,

while older companies which have established sufficient reserves can afford to pay liberal dividends.

6. Future Financial Requirements. It is not only the desires of the shareholders but also future financial requirements of the company that have to be taken into consideration while making a dividend decision.

7. Government's Economic Policy. The dividend policy of a firm has also to be adjusted to the economic policy of the Government as was the case when the Temporary Restriction of Payment of Dividend Ordinance was in force. In 1974 and 1975, companies were allowed to pay dividends not more than 33 % of their profits or 12 % on the paid-up value of the shares, whichever was lower.

8. Taxation Policy. The taxation policy of the Government also affects the dividend decision of a firm. A high or low rate of business taxation affects the net earnings of company (after tax) and thereby its dividend policy.

9. Inflation. Inflation acts as a constraint in the payment of dividends. Profits as arrived from the profit and loss account on the basis of historical cost have a tendency to be overstated in times of rise in prices due to over valuation of stock-in-trade and writing off depreciation of fixed assets at lower rates.

10. Control Objectives. When a company pays high dividends out of its earnings, it may result in the dilution of both control and earnings for the existing shareholders.

11. Requirements of Institutional Investors. Dividend policy of a company can be affected by the requirements of institutional investors such as financial institutions, banks insurance corporations, etc.

12. Stability of Dividends. Stability of dividends is another important guiding principle in the formulation of a dividend policy. Stability of dividend simply refers to the payment of dividend regularly and shareholders, generally, prefer payment of such regular dividends.

DETERMINANTS OF DIVIDEND POLICY	
1.	Legal Restrictions
2.	Magnitude and Trend of Earnings
3.	Desire and Type of Shareholders
4.	Nature of Industry
5.	Age of the Company
6.	Future Financial Requirements
7.	Government's Economic Policy
8.	Taxation Policy
9.	Inflation
10.	Control Objectives
11.	Requirements of Institutional Investors
12.	Stability of Dividends
13.	Liquid Resources

13. Liquid Resources. The dividend policy of a firm is also influenced by the availability of liquid resources. Although, a firm may have sufficient profits to declare dividends, yet it may not be desirable to pay dividends if it does not have sufficient liquid resources. The company may resort to declare stock dividend in such cases.

TYPES OF DIVIDEND POLICY

The various types of dividend policies are discussed as follows:

(a) **Regular Dividend Policy**

Payment of dividend at the usual rate is termed as regular dividend. The investors such as retired persons, widows and other economically weaker persons prefer to get regular dividends. A regular dividend policy offers the following advantages:

(a) It establishes a profitable record of the company.

(b) It creates confidence amongst the shareholders.

(c) It aids in long-term financing and renders financing easier.

(d) It stabilises the market value of shares.

(e) The ordinary shareholders view dividends as a source of funds to meet their day-to-day living expenses.

(f) If profits are not distributed regularly and are retained, the shareholders may have to pay a higher rate of tax in the year when accumulated profits are distributed.

2. Stable Dividend Policy

The term 'Stability of dividends' means consistency or lack of variability in the stream of dividend payments. In more precise terms, it means payment of certain minimum amount of dividend regularly. A stable dividend policy may be established in any of the following three forms:

(a) Constant dividend per share. Some companies follow a policy of paying fixed dividend per share irrespective of the level of earnings year after year.

(b) Constant payout ratio. Constant pay-out ratio means payment of a fixed percentage of net earnings as dividends every year.

(c) Stable rupee dividend plus extra dividend. Some companies follow a policy of paying constant low dividend per share plus an extra dividend in the years of high profits. Such a policy is most suitable to the firm having fluctuating earnings from year to year.

3. Irregular Dividend Policy

Some companies follow irregular dividend payments on account of the following:

(a) Uncertainty of earnings

(b) Unsuccessful business operations

(c) Lack of liquid resources

(d) Fear of adverse effects of regular dividends on the financial standing of the company.

4. No Dividend Policy. A company may follow a policy of paying no dividends presently because of its unfavourable working capital position or on account of requirements of funds for future expansion and growth.

DIVIDEND POLICY IN PRACTICE

We have observed earlier that the main consideration in determining the dividend policy is the objective of maximisation of wealth of shareholders. Thus, a firm should retain the earnings if it has profitable investment opportunities, giving a higher rate of return than the most of retained earnings, otherwise it should pay them as dividends. It implies that a firm should treat retained earnings as the active decision variable, and the dividends as the passive residual.

In actual practice, however, we find that most firms determine the amount of dividends first, as an active decision variable, and the residue constitutes the retained earnings. In fact, there is no choice with the companies between paying dividends and not paying dividends. Most of the companies believe that by following a stable dividend policy with a high pay-out ratio, they can maximise the market value of shares. Moreover, the image of such companies is also improved in the market and the investors also favour such companies. The firms following this policy can, thus, successfully approach the market for raising additional funds for future expansion and growth, as and when required. It has, therefore, been rightly said that theoretically, retained earnings should be treated as the active decision variable, and dividends as passive residual, but the practice does not conform to this in most cases.

It has been observed that the managements of Indian firms believe that dividend policy conveys information about the current and future prospects of the firm and thus affects its market value. They do consider the investor's preference for dividends and shareholder profile while designing the dividend policy. They also have a target dividend payout ratio but want to pay stable dividends with growth.

Problem 10. The earnings per share of company are Rs.8 and the rate of capitalisation applicable to the company is 10%. The company has before it an option of adopting a payout ratio of 25% or 50% or 75%. Using Walter's formula of dividend payout, compute the market value of the company's share if the productivity of retained earnings is (i) 15% (ii) 10% and (iii) 5%

According to Walter's formula

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

where, P = Market price per share

D = dividend per share

r = Internal rate of return

E = Earnings per share

k_e = Cost of equity capital

Computation of Market Value of Company's Shares		
(i) r=15%	(ii) r=10%	(iii) r=5%
a) When dividend pay-out ratio is 25%		
$P = \frac{2}{0.10} + \frac{0.15(8-2)/0.10}{0.10}$ $= \frac{2}{0.10} + \frac{0.15(6)/0.10}{0.10}$ $= \frac{2}{0.10} + \frac{9}{0.10}$ = Rs. 110	$P = \frac{2}{0.10} + \frac{0.10(8-2)/0.10}{0.10}$ $= \frac{2}{0.10} + \frac{0.10(6)/0.10}{0.10}$ $= \frac{2}{0.10} + \frac{6}{0.10}$ = Rs. 80	$P = \frac{2}{0.10} + \frac{0.05(8-2)/0.10}{0.10}$ $= \frac{2}{0.10} + \frac{0.05(6)/0.10}{0.10}$ $= \frac{2}{0.10} + \frac{3}{0.10}$ = Rs. 50
b) When dividend pay-out ratio is 50%		
$P = \frac{4}{0.10} + \frac{0.15(8-4)/0.10}{0.10}$ $= \frac{4}{0.10} + \frac{0.15(4)/0.10}{0.10}$ $= \frac{4}{0.10} + \frac{6}{0.10}$ = Rs. 100	$P = \frac{4}{0.10} + \frac{0.10(8-4)/0.10}{0.10}$ $= \frac{4}{0.10} + \frac{0.10(4)/0.10}{0.10}$ $= \frac{4}{0.10} + \frac{4}{0.10}$ = Rs. 80	$P = \frac{4}{0.10} + \frac{0.05(8-4)/0.10}{0.10}$ $= \frac{4}{0.10} + \frac{0.05(4)/0.10}{0.10}$ $= \frac{4}{0.10} + \frac{2}{0.10}$ = Rs. 60
c) When dividend pay-out ratio is 75%		
$P = \frac{6}{0.10} + \frac{0.15(8-6)/0.10}{0.10}$ $= \frac{6}{0.10} + \frac{0.15(2)/0.10}{0.10}$ $= \frac{6}{0.10} + \frac{3}{0.10}$ = Rs. 90	$P = \frac{6}{0.10} + \frac{0.10(8-6)/0.10}{0.10}$ $= \frac{6}{0.10} + \frac{0.10(2)/0.10}{0.10}$ $= \frac{6}{0.10} + \frac{2}{0.10}$ = Rs. 80	$P = \frac{6}{0.10} + \frac{0.05(8-6)/0.10}{0.10}$ $= \frac{6}{0.10} + \frac{0.05(2)/0.10}{0.10}$ $= \frac{6}{0.10} + \frac{1}{0.10}$ = Rs. 70

Problem 11. The following information relates to XYZ Ltd.:

	Rs.
Paid-up equity capital	20,00,000
Earnings of the company	2,00,000
Dividend paid	1,60,000
Price-earnings ratio	12.5
Number of shares outstanding	20,000

You are required to find out whether the company's dividend payout ratio is optimal, using Walter's Model.

Solution:

As per Walter's Model, the market price of the share is

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

where, P = Market price per share
D = dividend per share
r = Internal rate of return
E = Earnings per share
k_e = Cost of equity capital

Earnings per share (E) $= \frac{\text{Total Earnings}}{\text{No.of Shares}} = \frac{2,00,000}{20,000} = \text{Rs.}10$

Dividend per share (D) $= \frac{\text{Amount of Dividend paid}}{\text{No.of Shares}} = \frac{1,60,000}{20,000} = \text{Rs.}8$

Internal rate of return (r) $= \frac{\text{Total Earnings}}{\text{Total Equity}} * 100 = \frac{2,00,000}{20,00,000} * 100 = 10\%$

$$k_e = \frac{1}{\text{Price/Earning Ratio}} = \frac{1}{12.5\%} = 8\%$$

$$P = \frac{8}{0.08} + \frac{0.10(10-8)/0.08}{0.08}$$

$$P = \frac{8}{0.08} + \frac{0.10(2)/0.08}{0.08}$$

$$P = \frac{8+2.5}{0.08} = \frac{10.5}{0.08} = Rs.131.25$$

At present the dividend pay-out ratio is 80% $\left(\frac{1,60,000}{2,00,000} * 100\right)$

Since this is a growth firm having internal rate of return (r=10%)> cost of capital (k_e=8%), the firm's pay-out ratio of 80% is not optimal as per Walter's model. The market price of the company's share shall be maximum if it retains 100% of the profits and dividend pay-out ratio is zero. This can be proved as below:

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

$$P = \frac{0}{0.08} + \frac{0.10(10-0)/0.08}{0.08} = \frac{0+12.5}{0.08}$$

P = Rs. 156.25

Thus, the firm can increase the market price of the share up to Rs. 156.25 by increasing the retention ratio to 100%, the optimal pay-out ratio for the firm is zero.

Problem 12. ABC Ltd. has a capital of Rs. 10 lakhs in equity shares of Rs. 100 each. The shares are quoted at par. The company proposes to declare a dividend of Rs. 10 per share at the end of current financial year. The capitalisation rate for the risk class to which the company belongs is 12%. What will be the market price of the share at the end of the year, if:

1) dividend is not declared
2) dividend is declared
3) Assuming that the company pays the dividend and has net profits of Rs. 5,00,000 and makes new investments of Rs. 10 lakhs during the period, how many new shares must be issued? Use the MM model.

Solution:

According to the MM model, the price of the share at the end of the current financial year can be calculated as below:

$$P_1 = P_o(1 + k_e) - D_1$$

where,

P_o = Prevailing Market Price of the Share

P_1 = Market Price per share at the end of the year

D_1 = Dividend to be received at the end of the year

k_e = Cost of equity capital

Substituting the values in the above equation:

a) When a dividend is not declared

$$P_1 = P_o(1 + k_e) - D_1$$
$$P_1 = 100(1 + 0.12) - 0$$
$$P_1 = 100(1 + 0.12) = Rs.112$$

b) When a dividend is declared (Rs. 10 per share)

$$P_1 = P_o(1 + k_e) - D_1$$
$$P_1 = 100(1 + 0.12) - 10$$

= 112—10 = Rs. 102

Number of shares to be issued assuming that the company pays the dividend:

$$m = \frac{I - (E - {}_n D_1)}{P_1}$$

Where, m = Number of shares to be issued
I = Investment required
E = Total earnings of the firm during the period
n = Number of shares outstanding at the beginning of the period.
D = Dividend to be paid at the end of the period.
P_1= Market price per share at the end of the period.

Substituting the values

$$m = \frac{10,00,000 - (5,00,000 - 10,000 \times 10)}{102}$$

$$= \frac{10,00,000 - (4,00,000)}{102}$$

$$= \frac{6,00,000}{102} = 5882 \text{ shares (appx).}$$

FORMS OF DIVIDEND

Dividends may also be classified on the basis of medium in which they are paid:

(a) Cash Dividend. A cash dividend is a usual method of paying dividends. Payment of dividend in cash results in outflow of funds and reduces the company's net worth, though the shareholders get an opportunity to invest the cash in any manner they desire. This is why the ordinary shareholders prefer to receive dividends in cash. But the firm must have adequate liquid resources at its disposal or provide for such resources so that its liquidity position is not adversely affected on account of cash dividends.

(b) Scrip or Bond Dividend. A scrip dividend promises to pay the shareholders at a future specific date. In case a company does not have sufficient funds to pay dividends in cash, it may issue notes or bonds for amounts due to the shareholders. The objective of scrip dividend is to postpone the immediate payment of cash. A scrip dividend bears interest and is accepted as a collateral security.

(c) Property Dividend. Property dividends are paid in the form of some assets other than cash. They are distributed under exceptional circumstances and are not popular in India.

(d) Stock Dividend. Stock dividend means the issue of bonus shares to the existing shareholders. If a company does not have liquid resources it is better to declare stock dividend.

BONUS ISSUE

A company can pay bonus to its shareholders either in cash or in the form of shares. Many a times, a company is not in a position to pay bonus in cash inspite of sufficient profits because of unsatisfactory cash position or because of its adverse effects on the working capital of the company. In such cases, if the company so desires and the articles of association of the company provide, it can pay bonus to its shareholder in the form of shares by making partly paid shares as fully paid or by the issue of fully paid bonus shares.

The following circumstances warrant the issue of bonus shares

(1) When a company has accumulated huge profits and reserves and it desires to capitalise these profits so as use them on permanent basis in the business.

(2) When the company is not able to declare higher rate of dividend on its capital, in spite of sufficient profits, due to restrictions imposed by the Government in regard to payment of dividend.

(3) When higher rate of dividend is not advisable for the reason that the shareholder may expect the same higher rate of dividend in future also.

(4) When the company cannot declare a cash bonus because of unsatisfactory cash position and its adverse effects on the working capital of the company.

(5) When there is a large difference in the nominal value and market value of the shares of the company.

Hence, the bonus issue is made to achieve the following objects:

(1) To bring the amount of issued and paid up capital in line with the capital employed so as to depict more realistic earning capacity of the company.

(2) To bring down the abnormally high rate of dividend on its capital so as to avoid labour problems such as demand for higher wages and to restrict the entry of new entrepreneurs due to the attraction of abnormal profits, as illustrated below:

Balance Sheet of X Co. **(Prior to bonus issue)**			
Liabilities	**Rs.**	**Assts**	**Rs.**
Share capital	5,00,000	Fixed Assets	15,00,000
Reserve	15,00,000	Current Assets	7,00,000
Creditors	2,00,000		
	22,00,000		22,00,000

Assume that the company earns a profit of Rs.4,00,000 in the year. It will mean $\frac{4,00,000\times100}{5,00,000}$ i.e., 80% returns on its capital and it may attract many new entrepreneurs into the business and may also create other problems from labour. But in reality the profit of Rs.4,00,000 has been earned not on capital of Rs.5,00,000 but on the actual investment of Rs.20,00,00 i.e., Rs.5,00,000 capital plus Rs.15,00,000 Reserves, making a return on its actual investments to

$$\frac{4,00,000\times100}{20,00,000} = 20\% \text{ only}$$

Hence, to bring down abnormally high rate of dividend, it is advisable that the company should issue shares.

(3) To pay bonus to the shareholders of the company without affecting its liquidity and the earning capacity of the company

(4) To make the nominal value and the market value of the shares of the company comparable.

(5) To correct the balance sheet so as to give a realistic view of the capital structure of the company.

GUIDELINES FOR THE ISSUE OF BONUS SHARES

The following regulations have been provided by the SEBI (Issue of Capital and Disclosure Requirements) Regulations, 2009 for issue of bonus shares:

1. Conditions for bonus issue

Subject to the provisions of the Companies Act, 1956 or any other applicable law for the time being in force, a listed issuer may issue bonus shares to its members if:

(a) it is authorised by its articles of association for issue of bonus shares, capitalisation of reserves, etc:

Provided that if there is no such provision in the articles of association, the issuer shall pass a resolution at its general body meeting making provisions in the articles of associations for capitalisation of reserve;

(b) it has not defaulted in payment of interest or principal in respect of fixed deposits or debt securities issued by it;

(c) it has sufficient reasons to believe that it has not defaulted in respect of the payment of statutory dues of the employees such as contribution to provident fund, gratuity and bonus;

(d) the partly paid shares, if any outstanding on the date of allotment, are made fully paid up.

2. Restriction on bonus issue

(1) No issuer shall make a bonus issue of equity shares if it has outstanding fully or partly convertible debt instruments at the time of making the bonus issue, unless it has made reservation of equity shares of the same class in favour of the holders of such outstanding convertible debt instruments in proportion to the convertible part thereof.

(2) The equity shares reserved for the holders of fully or partly convertible debt instruments shall be issued at the time of conversion of such convertible debt instruments on the same terms or same proportion on which the bonus shares were issued.

3. Bonus shares only against reserves, etc. if capitalised in cash

(1) The bonus issues shall be made out of free reserves built out of the genuine profits or securities premium collected in cash only and reserves created by revaluation of fixed assets shall not be capitalised for the purpose of issuing bonus shares.

(2) Without prejudice to the provisions of sub-regulation (1), the bonus share shall not be issued in lieu of dividend.

4. **Completion of bonus issue**

(1) An issuer, announcing a bonus issue after the approval of its board of directors and not requiring shareholders approval for capitalisation of profits or reserves for making the bonus issue, shall implement the bonus issue within fifteen days from the date of approval of the issue by its board of directors:

Provided that where the issuer is required to seek shareholders' approval for capitalisation of profits or reserves for making the bonus issue, the bonus issue shall be implemented within two months from the date of the meeting of its board of directors where in the decision to announce the bonus issue was taken subject to shareholders' approval.

(2) Once the decision to make a bonus issue is announced, the issue cannot be withdrawn.

REVIEW QUESTIONS

A. Short Answer Type Questions

1. Name the two main theories of dividend
2. Enlist the factors that influence the dividend policy of a firm.
3. What is the significance of stable dividends?
4. What is dividend pay-out ratio?
5. What do you mean by bonus issue?
6. Write a note on dividend policy in practice.

B. Essay Type Questions

1. Explain the various factors which influence the dividend decision of a firm.
2. What do you understand by a stable dividend policy? Why should it be followed?
3. Discuss the various forms of dividends.
4. Do you agree with the proposition that dividends are irrelevant? Discuss the main determinants of the dividend policy of a corporate enterprise.

EXERCISE

Ex.1 The Agro-Chemicals Company belongs to a risk class for which the appropriate capitalisation rate is 10%. It currently has 1,00,000 shares selling at Rs.100 each. The firm is contemplating the declaration of Rs.5 as dividend at the end of the current financial year which has just begun. What will be the price of the share at the end of the year, if a dividend is not declared? What will be the price if it is declared? Answer this on the basis of MM model and assume no taxes.

(**Ans**. (i) Rs.110: (ii) Rs.105)

Ex.2. The earnings per share of a company are Rs.16. The market rate of discount applicable to the company is 12.5%. Retained earnings can be employed to yield a return of 10%. The company is considering a payout of 25%, 50% and 75%. Which of these would maximise the wealth of share holders?

(Ans.75%)

Ex.3. The earnings per share of a company are Rs.10 and the rate of capitalisation applicable to it is 10%. The company has before it the options 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 earnings is (i) 20%, (ii) 10%, and (ii) 8%.

What inference can be drawn from the above exercise.

(**Ans**.Rs.180. 160. and 120, Rs.100, 100, and 100, Rs.84, 88 and Rs.96)

Ex.4. A company is expected to pay a dividend of Rs.2 per equity share. The dividends are expected to grow at the rate of 10%. Find out the share price today, if market capitalises dividend at 30%.

(**Ans**. Rs.10)

Ex.5. A company presently pays a dividend of Re.1.00 per share and has a share price of Rs.25.00. If the dividend is expected to grow at a rate of 15% p.a forever, what is the firm's expected or required return on equity using a dividend discount model approach?

(**Ans**. 19.6%).

Ex. 6. A company has a total investment of Rs. 5,00,000 in assets, and 50,000 outstanding ordinary shares at Rs. 10 per share (par value). It earns a rate of 15% on its investment, and has a policy of retaining 50% of the earnings. If the appropriate discount rate of the firm is 10%, determine the price of its share using Gordon's Model. What shall happen to the price of the share if the company has a pay-out of 80%.

(**Ans**. Rs. 30 and Rs. 17.14)