LOVELY PROFESSIONAL UNIVERSITY

BASIC FINANCIAL MANAGEMENT

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SYLLABUS

Basic Financial Management

Objectives: To acquaint students with various concepts of Financial Management. It would enable them to understand various types of decisions taken by a business organisation in the area of Finance.

S. No.	Description
1	Meaning, Objectives and Scope of Financial Management
2	Finance Functions -Investment, Financing, Liquidity & Dividend Decisions. Risk & Return Trade off.
3	Source of Finance – Long term, Medium term & short term Time Value of Money – Basic Concepts
4	Cost of Capital: Concept and its significance, measurement of cost of capital of various sources of funds. Weighted Average cost of capital.
5	Capital Structure Decision: Understanding debt and equity
6	Theories of Capital Structure, Optimum Capital Structure
7	Capital Budgeting : Analytical study of various methods of Capital Budgeting
8	Working Capital – Concept and Significance, Determining working capital requirements; Basics of receivables, Inventory and cash management.
9	Dividend Policy; Determinants of Dividend Policy, Theories of dividend and Forms of dividend
10	Break Even Analysis

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Unit 1: An Overview of Financial Management

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Objectives

Introduction

1.1 Meaning and Definition of Financial Management

1.2 Objectives of Financial Management

1.3 Scope of Financial Management

1.4 Finance Functions

1.5 Risk and Return Trade off

1.6 Summary

1.7 Keywords

1.8 Self Assessment

1.9 Review Questions

1.10 Further Readings

Objectives

After studying this unit, you will be able to:

- Explain meaning of financial management
- Discuss objectives and scope of financial management
- Describe Finance functions like investment, financing, liquidity and dividend decisions
- Define risk and return trade off

Introduction

Finance is one of the basic foundations of all kinds of economic activities; it is the master key which provides access to all the sources for being employed in manufacturing and merchandising activities. However, it is also true that money begets more money, only when it is properly managed. Hence, efficient management of finances is very important. In short, we can say that "Finance is the backbone of every business".

1.1 Meaning and Definition of Financial Management

According to ***Van Horne and Wachowicz***, "Financial Management is concerned with the acquisition, financing and management of assets with some overall goal in mind." Financial manager has to forecast expected events in business and note their financial implications. First, anticipating financial needs means estimation of funds required for investment in fixed and current assets or long-term and short-term assets. Second, acquiring financial resources–once the required amount of capital is anticipated, the next task is acquiring financial resources i.e., where and how to obtain the funds to finance the anticipated financial needs and the last one is, allocating funds in business – means allocation of available funds among the best plans of assets, which are able to maximize shareholders' wealth. Thus, the decisions of financial management can be divided into three viz., investment, financing and dividend decision.

Notes

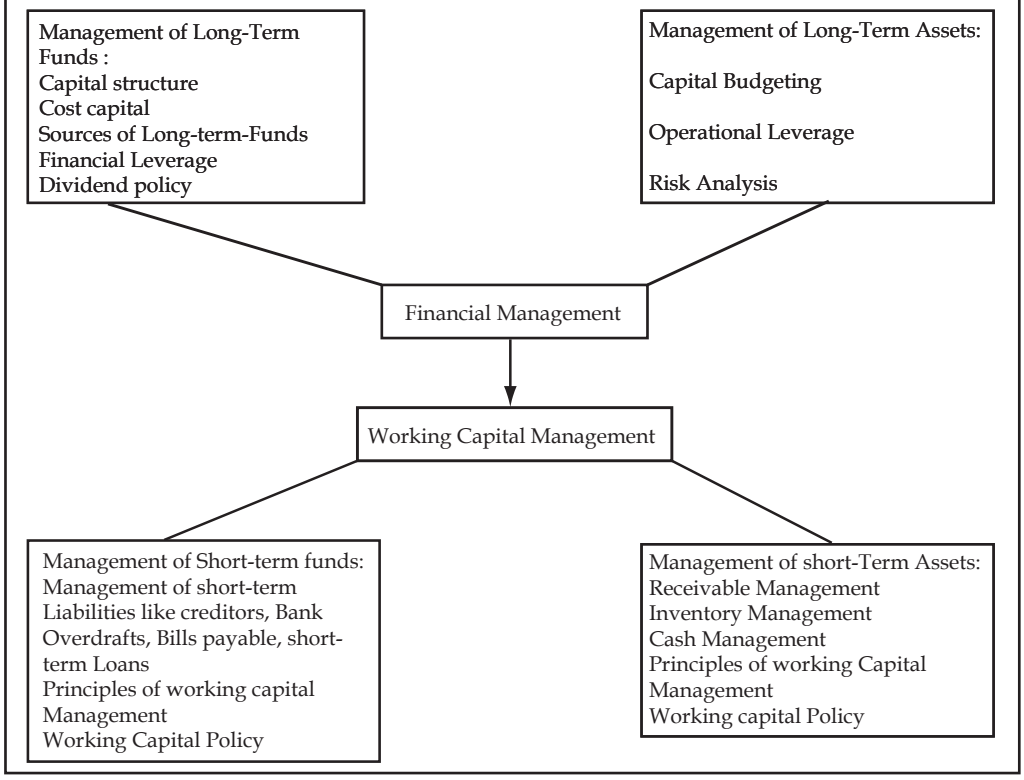
Caution Financial Management is broadly concerned with the acquisition and use of funds by a business firm. Its scope may be defined in terms of the following questions.

1. How large should the firm be and how fast should it grow?
2. What should be the composition of the firm's assets?
3. What should be the mix of the firm's financing?
4. How should the firm analyze, plan and control its financial affairs?

Financial Management is concerned with the efficient use of an important economic resource namely, capital funds.

Thus, Financial Management includes – Anticipating Financial Needs, Acquiring Financial Resources and Allocating Funds in Business (i.e., Three A's of financial management).

Figure 1.1: Framework of Financial Management



1.2 Objectives of Financial Management

(Profit – Maximization vs Wealth Maximization)

The goals of financial management can be broadly classified into two categories:

1. ***Basic Goals:*** Traditionally, the basic goals of financial management have been (A) Maintenance of liquid assets and (B) Maximization of profitability of the firm. However, these days, there is a greater emphasis on (C) Shareholders' wealth maximization rather than on profit maximization.

Notes

(a) *Maintenance of Liquid Assets:* Financial management aims at maintenance of adequate liquid assets with the firm to meet its obligations at all times. However, investment in liquid assets has to be adequate – neither too low nor too excessive. The finance manager has to maintain a balance between liquidity and profitability.

(b) *Maximization of Profit:* "Profit maximization" is a term which denotes the maximum profit to be earned by an organization in a given time period. The profit- maximization goal implies that the investment, financing and dividend policy decision of the enterprise should be oriented to profit maximization.

The term "Profit" can be used in two senses – first, as the owner-oriented concept and the second, as the operational concept.

Profit as the owner-oriented concept, refers to the amount of net profit, which goes in the form of dividend to the shareholders. Profit as the operational concept means profitability, which is an indicator of economic efficiency of the enterprise.

Profitability-maximization implies, that the enterprise should select assets, projects and decisions, that are profitable and reject the non-profitable ones. It is in this sense, that the term profit- maximization is used in financial management.

Merits of Profit – Maximization

1. ***Best Criterion on Decision-Making:*** The goal of profit – maximization is regarded as the best criterion of decision-making as it provides a yardstick to judge the economic performance of the enterprises.
2. ***Efficient Allocation of Resources:*** It leads to efficient allocation of scarce resources as they tend to be diverted to those uses which, in terms of profitability, are the most desirable.
3. ***Optimum Utilization:*** Optimum utilization of available resource is possible.
4. ***Maximum Social Welfare:*** It ensures maximum social welfare in the form of maximum dividend to shareholders, timely payment to creditors, higher wages, better quality and lower prices, more employment opportunities to the society and maximization of capital to the owners.

However, the profit-maximization objective suffers from several drawbacks which are as follows.

1. ***Time Factor Ignored:*** The term 'Profit' does not speak anything about the period of profit- whether it is short-term profit or long-term profit.
2. ***It is Vague:*** The term 'Profit' is very vague. It is not clear in what exact sense the term profit is used. Whether it is Accounting profit or Economic profit or profit after tax or profit before tax.
3. ***The Term 'Maximum' is also Ambiguous:*** The term 'maximum' is also not clear. The concept of profit is also not clear. It is therefore, not possible to maximize what cannot be known.
4. ***'It' Ignores Time Value:*** The profit maximization objective fails to provide any idea regarding the timing of expected cash earnings. The choice of a more worthy project lies in the study of time value of future inflows of cash earnings. It ignores the fact that the rupee earned to day is more value able than a rupee earned later.
5. ***'It' Ignores the Risk Factor:*** According to economists, profit is a reward for risk and uncertainty bearing. It is also a dynamic surplus or profit is a reward for innovation. But when can the organization maximize profits ? Profit – maximization objective does not make this clear.

Notes

(c) *Wealth Maximization:* Wealth- maximization is also called value- maximization. The wealth or 'net present worth' of a course of action is the difference between gross present worth and the amount of capital investment required to achieve the benefits. Gross Present-worth represents the present value of expected cash benefits.

Wealth- maximization is also called value-maximization. The wealth or 'net present worth' of a course of action is the difference between gross present worth and the amount of capital investment required to achieve the benefits. Gross Present-worth represents the present value of expected cash benefits.

Significance of Wealth- Maximization

The company, although it-cares more for the economic welfare of the shareholders, cannot forget the others who directly or indirectly work for the over-all development of the company. Thus, Wealth- Maximization takes care of.

1. Lenders or creditors
2. Workers or Employees
3. Public or Society
4. Management or Employer

Note Wealth-maximization means maximizing the present value of a course of action (i.e. NPV = GPW of benefits – Investment). Any financial action which results in positive NPV, creates and adds to the existing wealth of the organization and the course of action which has a negative NPV, reduces the existing wealth and hence be given up. All positive actions can be adopted, as they add to the existing wealth and help in wealth maximization.

2. ***Other goals:*** Besides the above basic goals, the following are the other goals of financial management.
   (a) Ensuring a fair return to shareholders
   (b) Building up reserves for growth and expansion
   (c) Ensuring maximum operational efficiency by efficient and effective utilization of finance
   (d) Ensuring financial discipline in the management

1.3 Scope of Financial Management

Study of the changes that have taken place over the years is known as "scope of financial management." In order to have an easy understanding and better exposition to the changes, it is necessary to divide the scope into two approaches.

1. ***Traditional Approach:*** The traditional approach, which was popular in the early stage, limited the role of financial management to raising and administering of funds needed by the corporate enterprises to meet their financial needs. It deals with the following aspects.
   (a) Arrangement of funds from financial institutions.
   (b) Arrangement of funds through financial instruments like share, bonds etc.

Notes

(c) Looking after the legal and accounting relationship between a corporation and its sources of funds.

Did u know? The term "Corporation Finance" was used in place of the present term "Financial Management".

2. ***Modern Approach:*** According to the modern approach, the term financial management provides a conceptual and analytical framework for financial decision-making. That means, the finance function covers both, acquisition of funds as well as their allocation. The new approach views the term financial management in a broader sense. It is viewed as an integral part of the overall management.

   The new approach is an analytical way of viewing the financial problems of a firm. The main contents of the modern approach are as follows:

   (a) What is the total volume of funds, an enterprise should commit?

   (b) What specific assets should an enterprise acquire?

   (c) How should the funds required, be financed?

   Thus, financial management, in the modern sense of the term, can be divided into four major decisions as functions of finance. They are:

   (a) The investment decision

   (b) The financing decision

   (c) The dividend policy decision

   (d) The funds requirement decision

1.4 Finance Functions

Financial Management is indeed, the key to successful business operations. Without proper administration and effective utilization of finance, no business enterprise can utilize its potentials for growth and expansion. Financial management is concerned with the acquisition, financing and management of assets with some overall goals in mind.

The important finance functions are as follows:

1. ***Investment Function:*** It is most important function of finance management. It begins with a determination of the total amount of assets needed to be held by the firm. In other words, investment decision relates to the selection of assets, that a firm will invest funds. The required assets fall into two groups:

   (a) *Long-term Assets* Long term assets involve huge investments and yield a return over a period of time in future.

Example: Fixed assets like plant & machinery, land and buildings, etc.

Did u know? Investment in long-term assets is popularly known as "capital budgeting".

   (b) *Short-term Assets*: Short term assets are those assets that can be converted into cash within a financial year without diminution in value.

Example: Current assets like raw materials, working in process, finished goods, debtors, cash, etc.

Notes

Did u know? Investment in current assets is popularly termed as "working capital management".

2. ***Financing:*** After estimation of the amount required and the assets that require purchasing, comes the next financing decision into the picture. Here, the financial manager is concerned with make up of the left hand side of the balance sheet. It is related to the financing mix or capital structure or leverage and he has to determine the proportion of debt and equity. It should be optimum finance mix, which maximizes shareholders' wealth. A proper balance will have to be struck between risk and return. Debt involves fixed cost (interest), which may help in increasing the return on equity alongwith an increase in risk.

   Raising of funds by issue of equity shares is one permanent source, but the shareholders expect higher rates of earnings.

3. ***Dividend Decision:*** Dividend function relates to dividend policy. Dividend is a part of profits that are available for distribution, to equity shareholders. Payment of dividends should be analyzed in relation to the financial decision of a firm. There are two options available in dealing with the net profits of a firm, viz., distribution of profits as dividends to the ordinary shareholders' where, there is no need of retention of earnings or they can be retained in the firm itself if they require, for financing of any business activity. But distribution of dividends or retaining should be determined in terms of its impact on the shareholders' wealth. The Financial manager should determine optimum dividend policy, which maximizes market value of the share thereby market value of the firm. Considering the factors affecting the dividend policy is another aspect of dividend policy.

4. ***Liquidity Decisions:*** The finance manager should also manage the current assets, to have liquidity in the business. Investment of funds in current assets reduces the profitability of the firm. However, at the same time, the finance manager should also look after the current financial needs of the firm to maintain optimum production. While investing funds in current assets, he must see that proper balance (trade off) is maintained between profitability and liquidity.

   Every financial decision involves this trade off. At this level the market value of the company's shares would be the maximum.

1.5 Risk and Return Trade off

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

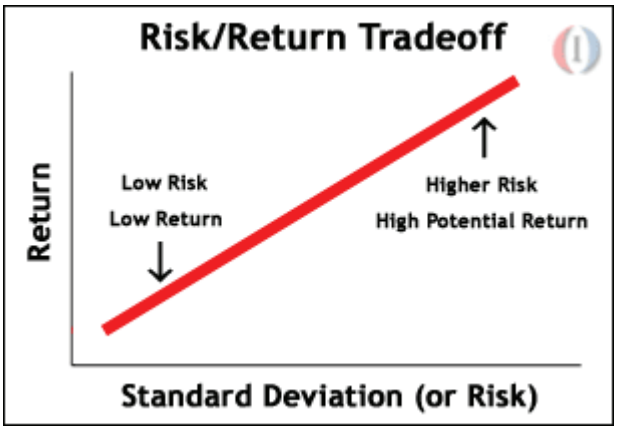
Financial decisions of the firm are guided by the risk-return trade-off. These decisions are interrelated and jointly affect the market value of its shares by influencing return and risk of the firm. The relationship between return and risk can be simply expressed as follows:

Return = Risk-free rate + Risk premium

The Figure 1.2 explains the relation between the risk and return.

Notes

Figure 1.2: Risk and Return Trade Off



Risk-free rate is a rate obtainable from a default-risk free government security. An investor assuming risk from her investment requires a risk premium above the risk-free rate. Risk-free rate is a compensation for time and risk premium for risk. Higher the risk of an action, higher will be the risk premium leading to higher required return on that action. A proper balance between return and risk should be maintained to maximise the market value of a firm's shares. Such balance is called risk-return trade-off, and every financial decision involves this trade-off.

Task Make an analysis on strategies used by Reliance Mutual Fund for maximizing the return of their customers.

Case Study

Bhatt Industries – Basic Planning

This case will help the reader, develop an approach to structuring a case solution. It requires a logical approach to solving a general financial problem.

Bhatt Industries has been manufacturing fireworks at a small facility just outside Greensboro, North Carolina. The firm is known for the high level of quality control in its production process and is generally respected by distributors in the states, where fireworks are legalized. Its selling market is fairly well defined ; it has the capacity to produce 800,000 cases annually, with peak consumption in the summer. The firm is fairly confident, that the whole of next year's production can be sold for ₹ 25 a case.

On September 7, the company has ₹ 8,000,000 in cash. The firm has a policy against borrowing, to finance its production, a policy first established by William Bhatt, the owner of the firm. Mr. Bhatt keeps a tight rein on the firm's cash and invests any excess cash in treasury bonds, that pays a 12 per cent return and involve no risk of default.

The firm's production cycle revolves around the seasonal nature of the fireworks business. Production begins right after Labour Day and runs through May. The firms sales occur in February through May ; the firm closes from June 1 to Labour Day, when its employees return to farming. During this time, Mr. Bhatt visits his grandchildren in New York and

Contd...

Notes

Pennsylvania. As a result of this scheduling, the firm pays all its expenses during September and in May receives, all its revenues from its distributors within 6 weeks after the 4th of July. The customers send their checks directly to Kenmy National Bank, where the money is deposited in Bhatt's account.

Mr. Bhatt is the only full-time employee of his company and he and his family hold all the common stock. Thus, the company's only costs are directly related to the production of fireworks. The costs are affected by the law of variable proportions, depending on the production level. The first 100,000 cases cost ₹ 16 each; the second 100,000 cases, ₹ 17 each ; the third 100,000 cases, ₹ 18 each and the fourth 100,000 cases, ₹ 19 each ; the fifth 100,000 cases, ₹ 20 each ; the sixth 100,000 cases, ₹ 21 each. As an example, the total of 200,000 cases would be ₹ 1,600,000 plus ₹ 1,700,000 or ₹ 3,300,000.

BHATT INDUSTRIES - INCOME STATEMENT
(August 31, fiscal year just ended)

Revenues from operations	50,00,000
Revenues from interest on government bonds	9,20,000
Total revenues	59,20,000
Operating expenses	40,50,000
Earnings before taxes	18,70,000
Taxes	9,48,400
Net income after taxes	9,21,600

Bhatt Industries is a corporation and pays a 30 per cent tax on income, because of the paperwork involved. Mr. Bhatt invests his excess cash on September 6 in one year treasury bonds. He does not invest for shorter periods.

Questions

1. How does this level affect long-term prospects of wealth maximization ?
2. What should be the level of production to maximize the profit?

1.6 Summary

- Business finance is the activity concerned with planning, raising, controlling and administering of the funds used in the business.
- Financial Management is concerned with the acquisition, financing and management of assets with some overall goal in mind. The main activities of a financial manager are (1) anticipating financial needs, (2) acquiring financial resources, and (3) allocating funds in the business.
- The scope of financial management can be studied under two approaches. (1) The traditional approach and (2) The modern approach.
- The scope of modern approach covers both, procurement of funds as well as their allocation.
- Investment decision relates to the selection of assets, that a firm will invest fund to procure. The required assets fall into two groups, long-term assets (fixed assets), and short-term assets (current assets).

Notes

- Financing decision is related to the financing mix or capital structure or leverage. While taking this decision, the financial manager has to determine the proportion of debt and equity.
- Dividend decision relates to dividend policy. Payment of dividends should be analyzed in relation to the financial decision of a firm.
- Financial management decisions are of different kinds but they are inter-related because the underlying objective of all the three decisions is (same) the maximisation of shareholders' wealth.

1.7 Keywords

Business Finance: It is that business activity which is concerned with the acquisition and conservation of capital funds in meeting financial needs and overall objectives of business enterprises.

Corporation: It is an association of two or more persons who contribute money or money's worth to a common stock and employs it in business, and who share profit and loss equally.

Corporate Finance: Corporate finance is the activity concerned with planning, raising, controlling and administering of the funds used in the business.

Dividend: Dividend is a part of profits that are available for distribution to shareholders.

Financing Decision: It is related to the financing mix or capital structure or leverage and the determination of the proportion of debt and equity.

Financial Management: It is the operational activity of a business that is responsible for obtaining and effectively utilising the funds necessary for efficient operations.

Investment Decision: Investment decision is related with the selection of assets, that a firm will invest.

Wealth Maximization: It is maximizing the present value of a course of action (i.e. NPV = GPW of benefits - Investment).

1.8 Self Assessment

Fill in the blanks:

1. Business Finance is wider than the ..... .
2. ..... Finance deals with the company form of business.
3. Maximization of ..... is the main goal of financial management.
4. ..... and ..... maximization are the goals of financial management.
5. Profit maximisation ignores ..... .
6. Equity shareholders' expected return is equal to risk free rate plus ..... .
7. ..... is a conflict of interest between the agent and the owner.

State whether the following statements are true or false:

8. Traditional concept of finance was limited to acquisition of funds.
9. Investment decision, financing decision, dividend decision are the decisions of finance.
10. There is no relation among finance decisions.

Notes

11. Profit maximisation is suitable for sole proprietorship concerns.
12. A rupee receivable today, is less valuable than a rupee receivable in future.
13. Having basic knowledge of economics is necessary for a financial manager.
14. There is risk involvement in financial decisions.
15. Principles of corporate finance can be applied to all types of organisations.

1.9 Review Questions

1. Write a note on the evolution of finance function.
2. Contrast the salient features of traditional and modern approaches to financial management.
3. Discuss in detail the scope of financial management.
4. Should the goal of financial decision-making be profit maximisation or wealth maximisation? Discuss.
5. In what respect is the objective of wealth maximisation superior to profit maximization?
6. "The profit maximization is not an operationally feasible criterion." Do you agree? Illustrate your views.
7. What are the basic financial decisions? How do they involve risk return trade-off?
8. "Finance functions of a business is closely related to its other functions". Discuss.
9. Assuming wealth maximization to be the objective of financial management, show how the financing, investment and dividend decisions of a company can help to attain this objective.
10. "……Finance has changed …….from a field that was concerned primarily with the procurement of funds to one, that includes the management assets, the allocation of capital and valuation of the firm" Elucidate.

Answers: Self Assessment

1.	Corporate finance	2.	Corporate
3.	Shareholders wealth	4.	Profit, Wealth
5.	Time value of money	6.	Risk premium
7.	Agency conflict	8.	True
9.	True	10.	False
11.	True	12.	False
13.	True	14.	True
15.	True		

1.10 Further Readings

Notes

Books

Chandra, P., *Financial Management - Theory and Practice*, New Delhi, Tata McGraw Hill Publishing Company Ltd., 2002, p. 3.

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Unit 2: Source of Finance

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Objectives

After studying this unit, you will be able to:

- Discuss Long, medium and short-term sources of finance
- Describe methods of raising long-term finance
- Explain methods of raising short-term finance

Notes

Introduction

We all know that every business requires some amount of money to start and run the business. Whether it is a small business or large, manufacturing or trading or transportation business, money is an essential requirement for every activity. Money required for any activity is known as finance. So the term 'business finance' refers to the money required for business purposes and the ways by which it is raised. Thus, it involves procurement and utilisation of funds so that business firms will be able to carry out their operations effectively and efficiently.

2.1 Types of Business Finance

The type and amount of funds required usually differs from one business to another. For instance, if the size of business is large, the amount of funds required will also be large. Likewise, the financial requirements are more in manufacturing business as compared to trading business. The business need funds for longer period to be invested in fixed assets like land and building, machinery etc. Sometimes, the business also needs fund to be invested in shorter period. So based on the period for which the funds are required, the business finance is classified into three categories.

1. ***Short-term Finance:*** Funds required to meet day-to-day expenses are known as short-term finance.

   Example: Purchase of raw materials, payment of wages, rent, insurance, electricity and water bills, etc.

   The short-term finance is required for a period of one year or less. This financial requirement for short period is also known as working capital requirement or circulating capital requirement.

2. ***Medium-term Finance:*** Medium-term finance is utilised for all such purposes where investments are required for more than one year but less than five years.

   Example: Amount required to fund modernisation and renovation, special promotional programmes etc.

3. ***Long-term Finance:*** The amount of funds required by a business for more than five years is called long-term finance.

   Example: The purchase of fixed assets like land and building, plant and machinery furniture etc.

   The long-term finance is also known as fixed capital as such need in fact is, of a permanent nature.

Note **Fixed vs Working Capital**

Fixed capital refers to the total value of assets in a business, which is of durable nature and used in a business over a considerable period of time. It comprises assets like land, building, machinery, furniture etc. The capital invested in these assets is fixed in the sense that these are required for permanent use in business and not for sale. Working capital consists of those assets which are either in the form of cash or can easily be converted into cash, e.g., cash and bank balances, debtors, bills receivable, stock, etc. These assets are also known as current assets. Working capital is needed for day-to-day operations of the business.

Notes

2.2 Instruments of Raising Long-term Finance

In small organisations the long-term finances are generally provided by the owners but for large organisations like joint stock companies there are various options available to raise the funds. The following are the key instruments of long-term finance:

1. Issue of Shares
2. Issue of Debentures
3. Loans from financial institutions
4. Public Deposits
5. Retention of Profit
6. Term loans form Banks
7. Lease Financing

2.2.1 Issue of Shares

Share is the smallest unit into which the total capital of the company is divided.

Example: When a company decides to raise ₹ 50 crores of capital from the public by issuing shares, then it can divide its capital into units of a definite value, say ₹ 10/- or ₹ 100/- each. These individual units are called as its share.

These may be of two types:

1. Equity shares
2. Preference shares

Equity Shares

Equity means 'equal'. Equity share is a share that gives equal right to holders. Equity shareholders have to share the reward and risk associated with ownership of company.

Example: ABC Company has 10,000 equity shareholders and it has earned ₹ 10,000 profit last year and assumes it may earn a loss of ₹ 10,000 in the next year.

Here, the shareholder will get ₹ 1 as profit from last year and ₹ 1 loss in the coming year's loss.

It is also called as ordinary share capital. Equity shareholders are the owners of the company, who have control over the working of the company. They are paid dividend at the rate recommended by Board of Directors (BoDs).

Features of Equity Shares

The following are the key features of equity shares:

1. ***Permanent Capital:*** An equity source is the main long-term or permanent source of finance. They can be redeemed or refunded only at the time of liquidation that too from the residue left after meeting all the obligations.
2. ***Residual Claim to Income:*** Equity shareholders have a residual claim to the income of a company. Residual claim means the income leftover after paying all outsider claims.

Notes

3. ***Residual Claim to Assets:*** Equity shareholders have a residual claim on firm's assets. In an event of liquidation of a firm, the assets are used first to settle the claims of outside creditors and preference shareholders, if anything left that is equity shareholders residue.
4. ***Voting right/Right to Control:*** Equity shareholders as real owners of the company they have voting right, in appointing Directors and Auditors of the company participate and vote in annual general meeting, which helps to control the company.
5. ***Limited Liability:*** This is the prime feature of equity share. Although, equity shareholders are the owners of the company, their liability is limited to the extent of the investment in the share.

Preference Shares

Preference share capital gives certain privileges to its holders on the equity shareholders. Preference shareholders have privileges in two ways:

1. A preferential privilege in payment of a fixed dividend. The fixed dividend may be in the form of fixed rate or fixed amount per share; and
2. Preferential right as to repayment of capital in case of liquidation/winding up of the company.

Note Preference share capital is a hybrid form of long-term finance, since it has the features of equity and debentures. Preference share resembles equity in the following ways:

1. Preference dividends are payable only after tax profits (PAT).
2. Payment of preference dividend depends on the discretion of BoD's, (it is not an obligatory payment).
3. Preference dividend is not a tax deductable payment.
4. Irredeemable preference shares are long-term in nature (they have no maturity date).

Preference share capital is similar to debenture capital in the following ways:

1. It carries a fixed rate of dividend.
2. It has prior claim on assets like debenture capital,
3. It normally does not have voting rights.
4. It is redeemable in nature (if it is redeemable preference share).
4. It does not have right to share residual profits/assets.

Features of Preference Share Capital

The features of preference share/ capital are as follows:

1. ***Claim on Assets:*** Companies does not create any charge on assets while issue of preference shares, still preference shareholders have prior claim on assets of the company in the event of liquidation. It means before payment of ordinary shareholders, the preference shareholders are paid.

Notes

2. ***Claim on Income:*** Not only the prior claim on assets at the time of liquidation, they also have prior claim on income or profits. Preference dividend must be paid in full before payment of any dividend on the equity share capital.

Did u know? **What is senior security?**

As preference share capital lies between debenture capital and equity share capital with regards to claim on assets and income of the company. Hence, it is called as "senior security".

3. ***Accumulation of Dividend:*** Most of the preference shares dividend is cumulative. It means that all the unpaid/arrears dividends are carried forward for the next year and paid with the current year's dividend before payment of any dividend to equity shareholders.

Example: Company A issues 10 per cent preference shares of ₹ 100 each, in the beginning of the financial year. The company needs to pay ₹ 10 as dividend but due to loss it was not able to pay, in this case the ₹ 10 is carried to the next year. If there are any profits in next year the company has to pay last year's dividend and the current year's dividend. Thereby the total dividend is ₹20.

4. ***Redeemable:*** Preference share capital has limited maturity period (if issued as redeemable) after that the share capital has to be refunded. It provides flexibility in capital structure, which is beneficial to the company.

5. ***Fixed Rate of Dividend:*** Issue of preference shares are at a fixed rate of dividend. The rate is at par value basis.

6. ***Convertible:*** Convertible preference shares capital has the feature of conversion of preference shareholders investment into fully or partly paid equity shares at a pre-determined ratio within a given/specified period.

7. ***Participation in Surplus Profits:*** Sometimes preference share capital is in the nature of participation in surplus profits.

Note It may be noted that the companies have to follow a prescribed procedure for issue of shares as per the Companies Act and the guidelines issued by Securities and Exchange Board of India (SEBI).

2.2.2 Issue of Debentures

The companies can raise long-term funds by issuing debentures that carry assured rate of return for investors in the form of a fixed rate of interest. It is known as debt capital or borrowed capital of the company. The debenture is a written acknowledgement of money borrowed. It specifies the terms and conditions, such as rate of interest, time of repayment, security offered, etc. These are offered to the public to subscribe in the same manner as is done in the case of shares.

Features of Debentures

The features of debentures/bonds are as follows:

1. ***Fixed Rate of Interest:*** In general the debentures are issued at a fixed rate of interest, but they may also issued at a floating rate of interest or a zero interest.

Notes

2. ***Maturity:*** The debenture capital is a cheapest source of long-term finance, but it should be repaid after a specific period. In other words, debentures are issued for a specific period (i.e., 10 years or 5 years debentures).

3. ***Redemption:*** Debentures can be repaid either in installment wise or lump sum. If it is repaid in one lump sum amount, it can be done by creation of debenture redemption reserve. It is compulsory for all debentures whose maturity period exceeds 18 months.

Caution Company should create dividend redemption reserve (DRR) equivalent to at least 50 per cent of the amount of issue before commencement of repayment.

4. ***Debenture Indenture:*** A debenture indenture is a legal document, which specifies the rights of both the issuing company and the debenture holder.

5. ***Security Interest:*** Debenture may be either secured or insecured. In India most of the debentures are secured debentures.

6. ***Convertibility:*** Companies can also issue convertible debentures. It is the debenture that is convertible into equity shares at the option of the debenture holder.

7. ***Credit Ratings:*** Before issue of debentures to the public, the issuing company needs to get the debentures rated by anyone of the credit rating agencies.

Note The key four credit rating agencies in India are: Credit Rating Information Services Of India Limited (CRISIL), Investment Information and Credit Rating Agency of India Limited (ICRA), Credit Analysis and Research Limited (CARL), FITCH India and Duff & Phelps Credit Rating India Pvt. Ltd (DCRI).

8. ***Claim on Income and Assets:*** Debenture holders have priority of claim on income. At the same time they also have priority of claim on company assets at the time of winding up.

Types of Debentures

The given below are the some important types of debentures:

1. ***Bearer Debentures:*** Bearer debentures are registered and are payable to the bearer. They are negotiable instruments and are transferable by delivery.

2. ***Registered Debentures:*** They are payable to the registered holder whose name appears both on the debentures and in the Register of Debenture Holders maintained by the company.

3. ***Secured Debentures:*** Debentures which create a change on the assets of the company which may be fixed or floating are known as secured Debentures.

Caution The term "bonds" and "debentures"(secured) are used interchangeably in common parlance. In USA, BOND is a long-term contract which is secured, whereas a debenture is an unsecured one.

4. ***Unsecured or Naked Debentures:*** Debentures which are issued without any charge on assets are insecured or naked debentures. The holders are like unsecured creditors and may see the company for the recovery of debt.

Notes

5. ***Redeemable Debentures:*** Normally debentures are issued on the condition that they shall be redeemed after a certain period. They can however, be reissued after redemption.

6. ***Perpetual Debentures:*** When debentures are irredeemable they are called perpetual. Perpetual Debentures cannot be issued in India at present.

7. ***Convertible Debentures:*** If an option is given to convert debentures into equity shares at the stated rate of exchange after a specified period, they are called convertible debentures.

8. ***Participating Debentures:*** They are unsecured corporate debt securities which participate in the profits of the company. They might find investors if issued by existing dividend paying companies.

2.2.3 Loans form Financial Institutions

There are many specialised financial institutions established by the Central and State governments which give long-term loans at reasonable rate of interest.

Example: Industrial Finance Corporation of India (IFCI), Industrial Development Bank of India (IDBI), Industrial Credit and Investment Corporation of India (ICICI), Unit Trust of India (UTI), and State Finance Corporations etc.

These financial institutions grant loans for a maximum period of 25 years. These loans are covered by mortgage of company's property and/or hypothecation of stocks shares etc.

The major benefits derived from such loans are:

1. The rate of interest payable is lower than the market rate and

2. The amount of loan is large.

2.2.4 Public Deposits

Public deposits or term deposits are in the nature of unsecured deposits, have been solicited by the firms (both large and small) from general public primarily for the purpose of short and medium term requirements.

Important Guidelines

Fixed deposits accepted by companies are governed by the Companies (Acceptance of Deposits) Amendment Rules, 1978. The main features of this regulation are:

1. A firm cannot issue public deposits for more than 25 per cent of its share capital and free reserves.

2. The public deposits can be issued for a period ranging from a minimum 6 months to maximum 3 years. Public deposits for a period of three months, however, can as well be issued, but only for an amount up to 10% of the company's share capital and free reserves. Maximum period of 5 years is allowed for Non-banking Financial Corporation (NBFCs).

3. The company that had raised funds by way of issue of public deposits is required to set aside, a deposit and/or investment, by the 30th April each year an amount equal to 10 per cent of the maturity deposits by the 31st March of the next year. The amount, so set aside can be used only for repairing the amount of deposits.

4. Finally, a company's and accepting the public deposits is required to disclose some true, fair, vital and relevant facts in regards to its financial position and performance.

Notes

Reasons for Raising Funds from Fixed Deposits

The following are the key reasons for raising funds from fixed deposits:

1. ***Company point of view:***
   (a) Simple procedure involved in issuing public deposits.
   (b) No restrictive covenants are involved.
   (c) No security is offered against public deposits.
   (d) Cheaper (post-tax cost is fairly reasonable).
2. ***Investors point of view:***
   (a) Higher interest rates when compared to other investment avenues.
   (b) Short maturity period.

2.2.5 Retention of Profit

Retained earnings are an important source of internal financing of well-established companies. Retained earnings are the portion of earnings available to equity shareholders, which are ploughed back in the company. In other words, a part of earnings available to equity shareholders that are retained for future investment. Hence, the process of accumulating company profits regularly and their utilisation in the business is known as retained earnings or ploughing back of profits or internal financing or self-investment.

Note Retained earnings are part of equity, since they are part of equity, which are sacrificed by equity shareholders. In this source of finance companies, generally retained or ploughed back about 20 per cent to 70 per cent of earnings available to equity shareholders for the purpose of financing of the growth of the company. This becomes a main source of long-term finance, when the management capitalizes profits. It is known as capitalization of profits or issue of bonus shares.

Merits of Retained Earnings

Following are the benefits of retention of profit.

1. ***Cheap source of capital:*** No expenses are incurred when capital is available from this source. There is no obligation on the part of the company either to pay interest or pay back the money. It can safely be used for expansion and modernisation of business.
2. ***Financial stability:*** A company which has enough reserves can face ups and downs in business. Such companies can continue with their business even in depression, thus building up its goodwill.
3. ***Benefits to the shareholders:*** Shareholders are assured of a stable dividend. When the company does not earn enough profit it can draw upon its reserves for payment of dividends. Not only that their holding size can improve with issue of bonus shares.

Due to reserves, there is capital appreciation, i.e., the value of shares may go up in the share market.

Notes

Demerits of Retained Earnings

The following are the important disadvantages of retained earnings:

1. Limited funds available by way of retained earnings.
2. Continuous retention of profits may lead to over capitalization.
3. Creation of monopolies, since retained earnings in bigger organisations helps to grow bigger which may lead to the monopoly.
4. Loss to shareholders, when a firm pays less dividends or no dividends due to retained earnings, shareholders may sell their shares for meeting their expenditure.
5. The management may misuse the retained earnings, which is not helpful to maximize shareholders wealth.
6. The cost of retained earnings is high, retained earnings are the dividends foregone by ordinary shareholders, which involve an opportunity cost.
7. Retained earnings leads to evasion of super profit tax, which is the revenue loss to the Government.

2.2.6 Term Loans

Traditionally, commercial banks in India do not grant long-term loans.

They grant loans only for short period not extending one year. But recently they have started giving loans for a long period. Commercial banks give term loans i.e. for more than one year. The period of repayment of short-term loan is extended at intervals and in some cases loan is given directly for a long period. Commercial banks provide long-term finance to small scale units in the priority sector.

Merits of Long-term Borrowings from Commercial Banks

The merits of long-term borrowing from banks are as follows:

1. It is a flexible source of finance as loans can be repaid when the need is met.
2. Finance is available for a definite period, hence it is not a permanent burden.
3. Banks keep the financial operations of their clients secret.
4. Less time and cost is involved as compared to issue of shares, debentures etc.
5. Banks do not interfere in the internal affairs of the borrowing concern, hence the management retains the control of the company.
6. Loans can be paid-back in easy instalments.
7. In case of small-scale industries and industries in villages and backward areas, the interest charged is low.

Demerits

Following are the demerits of borrowing from commercial banks:

1. Banks require personal guarantee or pledge of assets and business cannot raise further loans on these assets.
2. In case the short-term loans are extended again and again, there is always uncertainty about this continuity.

Notes

3. Too many formalities are to be fulfilled for getting term loans from banks. These formalities make the borrowings from banks time consuming and inconvenient.

2.2.7 Lease Financing

Lease is a contract whereby one can use the assets of the other with due permission of the owner on payment of rent without purchasing them. The owner of the asset is called 'lessor' and the user is called lessee. The period of use is called the lease period after which the lessee may opt for purchase of the asset.

So leasing is an arrangement that enables a business enterprise to use and exercise complete control over the assets without owning it. The owner gets rent in return and at any time as per the terms of the contract he can cancel the agreement. This system helps the business to use the plants and machinery and other fixed assets for a long period of time without investing a large amount of money in purchasing them. At the end of the lease period the asset goes back to the owner. The owner of the assets also has the option of selling it to the user at a reduced price. Sometimes the user company may request the leasing company to purchase its existing assets and allow them to use the same assets on lease basis. This enables the company to save the long-term funds that can be utilised for other purposes. This is known as 'sale and lease back' system.

2.3 Instruments of Raising Short-term Finance

Sources of short-term funds have to be used (exclusively) for meeting the working capital requirements only and not far financing fixed assets and for meeting the margin money for working capital loans.

The various sources of short-term financing are as follows:

2.3.1 Commercial Papers (CPs)

Commercial paper represents a short-term unsecured promissory note issued by firms that have a fairly high credit (standing) rating. It was first introduced in USA and it was an important money market instruments. In India, Reserve Bank of India introduced CP on the recommendations of the Vaghul Working Group on money market. CP is a source of short-term finance to only large firms with sound financial position.

Features of CP

1. The maturity period of CP ranges from 15 to 365 day (but in India it ranges between 91 to 180 days).
2. It is sold at a discount from its face value and redeemed at its face value.
3. Return on CP is the difference between par value and redeemable value.
4. It may be sold directly to investors or indirectly (through) dealers.
5. There is no developed secondary market for CP.

"Eligibility" Criteria for Issuing CP

CP is unsecured promissory note, the issue of CP is being regulated by the Reserve Bank of India. RBI has laid down the following conditions to determine the eligibility of a company that wishes to raise funds through the issue of CPs:

1. The Tangible Net Worth (TNW) of the company, as per latest audited balance sheet should not be less than ₹ 4 crore.

Notes

2. The company should have been sanctioned as a fund based limit for bank(s) finance and / or the All India Financial Institutions.
3. Company can issue CPs amounting to 75% of the permitted bank (working capital limit) credit.
4. Company's CPs receives a minimum rating of (P2 from CRISIL, A-2 form ICRA, etc).
5. The minimum size of each CP is ₹ 5 lakhs or multiples thereof.
6. The size of any single issue should not be less than ₹ 1 crore.
7. The CP is in the form of usance promissory note negotiable by endorsement and delivery.

Advantages of CP

1. It is an alternative source of finance and proves to be helpful during the period of tight bank credit.
2. It is a cheaper source of short-term finance when compared to the bank credit.

Disadvantages of CP

1. It is available only for large and financially sound companies.
2. It cannot be redeemed before the maturity date.

2.3.2 Certificates of Deposit

Certificates of Deposit is a negotiable money market instrument and issued in dematerialized form or as a Usance Promissory Note, for funds deposited at a bank or other eligible financial institution for a specified time period. Guidelines for issue of CDs are presently governed by various directives issued by the Reserve Bank of India, as amended from time to time. CDs can be issued by

1. scheduled commercial banks excluding Regional Rural Banks (RRBs) and Local Area Banks (LABs); and
2. select all-India Financial Institutions that have been permitted by RBI to raise short-term resources within the umbrella limit fixed by RBI.

Caution Banks have the freedom to issue CDs depending on their requirements. An FI may issue CDs within the overall umbrella limit fixed by RBI, i.e., issue of CD together with other instruments viz., term money, term deposits, commercial papers and intercorporate deposits should not exceed 100 per cent of its net owned funds, as per the latest audited balance sheet.

Advantages of Certificate of Deposit as a Money Market Instrument

The key advantages of certificate of deposits are as follows:

1. Since one can know the returns from before, the certificates of deposits are considered much safe.
2. One can earn more as compared to depositing money in savings account.
3. The Federal Insurance Corporation guarantees the investments in the certificate of deposit.

Notes

Disadvantages of Certificate of deposit as a money market instrument

The key disadvantages of certificate of deposits are as follows:

1. As compared to other investments the returns is less.
2. The money is tied along with the long maturity period of the Certificate of Deposit. Huge penalties are paid if one gets out of it before maturity.

2.3.3 Treasury Bills

Treasury bills were first issued by the Indian government in 1917. Treasury bills are short-term financial instruments that are issued by the Central Bank of the country. It is one of the safest money market instruments as it is void of market risks, though the return on investments is not that huge.

The reserve bank of India holds the major portion of outstanding treasury bills. These bills have a low yield and hence the other holders of treasury bills such as banks rediscount these bills with the RBI at the earliest opportunity.

The treasuries bills have not developed as an active monetary instrument in the market as these bills of 91 days do not provide a yield which is positive. Due to their high liquidity and safety, 182 days treasury bills despite low rates represent the most important instrument of money market and a versatile one in the hands of the effective fund managers of firms, companies and banks. 182 days treasury bills can be sold to discount and finance house of India or discounted with banks and Financial Institutions. The market can be improved only by enhancing the nominal rate of discount as compared to the expected rate in the price level. The development of an active secondary market for treasury bills depends on suitable support to brokers and dealers and permitting banks also to avail their services.

2.3.4 Inter-Corporate Deposits (ICDS)

A deposit made by one firm with another firm is known as inter-corporate deposits (ICDs). Generally, these deposits are usually made for a period up to six months. Such deposits may be of three types:

1. ***Call Deposits:*** Deposits are expected to be payable on call. In other words, whenever its repayment is demanded on just one days notice. But, in actual practice, the lender has to wait for at least 2 or 3 days to get back the amount. Inter corporate deposits generally have 12 per cent interest per annum.
2,. ***Three Months Deposits:*** These deposits are more popular among companies for investing the surplus funds. The borrower takes this type of deposits for tiding over a short-term cash inadequacy. The interest rate on these types of deposits is around 14 per cent per annum.
3. ***Six-Months Deposits:*** Generally, the inter-corporate deposits are made for a maximum period of six months. These types of deposits are usually given to 'A' category borrowers only and they carry an interest rate of around 16% per annum.

Features of ICDs

1. There are no legal regulation, which makes an ICD transaction very convenient.
2. Inter-corporate deposits are given and taken in secrecy.
3. Inter-corporate deposits are given based on borrower's financial sound, but in practice lender lends money based on personal contacts.

Notes

2.3.5 Trade Credit

Trade credit refers to credit granted to manufacturers and traders by the suppliers of raw material, finished goods, components, etc. Usually business enterprises buy goods on 30 to 90 days credit. This means that the goods are delivered but payments are not made until the expiry of the period of credit. This type of credit does not make the funds available in cash but it facilitates purchases without making immediate payment which amounts to funding it by suppliers. This is a very popular source of short-term finance.

2.3.6 Deferred Income

Deferred incomes are incomes received in advance by the firm for supply of goods or services in future period. These income receipts increase the firm's liquidity and constitute an important source of short-term source finance. These payments are not showed as revenue till the supply of goods or services, but showed in the balance sheet as income received in advance. Advance payment can be demanded by only firms having monopoly power, great demand for its products and services and if the firm is manufacturing a special product on a special order.

2.3.7 Commercial Banks

Commercial banks are the major source of working capital finance to industries and commerce. Granting loan to business is one of their primary functions. Getting bank loan is not an easy task since the lending bank office may ask number of questions about the prospective borrower's financial position and its plans for the future. At the same time bank will want to monitor of the borrower's business progress. But there is a good side to this, that is borrower's share price tends to rise, because investor know that convince banks is very difficult.

Forms of Bank Finance

Banks provide different types of tailored made loans that are suitable for specific needs of a firm. The different types of forms of loans are:

1. ***Loans:*** Loan in an advance is lumpsum given to borrower against some security. Loan amount is paid to the applicant in the form of cash or by credit to his/her account. In practice the loan amount is paid to the customer by crediting his/her account. Interest will be charged on the entire loan amount from the date the loan is sanctioned.
2. ***Overdrafts:*** Overdraft facility is an agreement between the borrower and the banker, where the borrower is allowed to withdraw funds in excess of the balance in his/her current accounts up to a certain limit during a specified period. It is flexible from the borrower 's point of view because the borrower can withdraw and repay the cash whenever he/she wants within the given stipulations. Interest is charged on daily over drawn balances and not on the overdraft limit given by the bank. But bank charges some minimum charges.
3. ***Cash Credit:*** It is the most popular source of working capital finance in India. A cash credit facility is an arrangement where a bank permits a borrower to withdraw money up to a sanctioned credit limit against tangible security or guarantees. Borrower does not require to withdraw the total sanctioned credit at a time, rather, he can withdraw according to his/her requirements and he can also repay the surplus cash in his cash credit account. Interest is chargeable on actually used amount and there is no commitment charge. Cash credit is a flexible source of working capital from borrower's point of view.

Notes

Note **Distinction between Cash Credit and Bank Overdraft**

1. Cash credit is an arrangement of credit granted by a bank to a firm. The firm may or may not have an account with the bank. Overdraft is granted to an accountholder purely on the basis of his credit-worthiness. Credit worthiness is decided by the financial soundness of past dealings of the customer with the bank.
2. In case of cash credit, the amount of credit is placed in a separate account of the borrower. Overdraft limit is generally granted to an existing account of the customer.
3. The amount of credit in case of cash credit depends upon the value of securities offered. But overdraft limit is decided on the average balance in the customers account.
4. Overdraft is granted without the security of any assets. But for cash credit, security of tangible assets is an essential requirement.

4. ***Discounting of Bill:*** Banks also give advance money by discounting bill of exchange. When a bill of exchange is presented before the bank for encashment, bank credits the amount to customer's account after deducting some discount. The amount of discount is charged on the basis of the interest for the period of bill. On maturity of the bill, the payment is received by the bank from the drawee.

2.3.8 Accruals

Accrued expenses are those expenses which the company owes to the other persons or organisations, but not yet due and not yet paid the amount. In other words, accruals represent a liability that a firm has to pay for the services or goods, which it has already received. It is spontaneous and interest-free sources of financing. Salaries, wages, interest and taxes are the major constituents of accruals. Salaries and wages are usually paid on monthly and weekly basis respectively. The amounts of salaries and wages have owed but not yet paid and shown them as accrued salaries and wages on the balance sheet at the end of financial year. Longer the time lag in payment of these expenses, the greater is the amount of funds provided by the employees. Similarly, interest and tax are other accruals, as source of short-term finance.

2.3.9 Factoring

Factoring is a method of raising short-term finance for the business in which the business can take advance money from the bank against the amount to be realised from the debtors. By this method, the firm shifts the responsibility of collecting the outstanding amount from the debtors on payment of a specified charge. Here the business gets the money in advance without waiting for due date. Also it saves the effort of collecting the debts.

Notes

Caselet

HSBC extends Factoring Service to SMEs

HSBC today announced the launch of factoring services to SMEs, whose rise in the wake of strong export growth has expanded opportunities in the financial business stream. The service would be available at Mumbai, New Delhi, Kolkata, Pune, Bangalore and Chennai. HSBC, which had been providing the factoring services to large corporates since 2005, decided to focus on SMEs due to their large contribution to the economy as factoring would help small businesses achieve faster growth by efficiently managing their working capital. Announcing the launch of the service on Tuesday, Mr Bhriguraj Singh, Senior Vice-President and Head Factoring (India), said that HSBC with a large SME customer base would not be looking at any particular sector of the business for its factoring service.

Key Determinant

He added that the key determinant would be the quality of the product or services that could fit within the manageable risk.

Stating that the ITES sector would be a business prospect, Mr Singh said that the bank would not be averse to IT product companies and would be factoring their transactions based on the parameters measurable risks.

Useful to Export Trade

Factoring is useful not only in export but also in export trade. It gains importance in today's international trade since international buyers are increasingly unwilling to enter into letter of credit-based transactions due to the additional monetary and administrative costs involved.

The bank has already deployed 200 people to promote the product among SMEs and would add more manpower as the business expanded, he said.

Source: thehindubusinessline.com

Task Visit the branches of any two banks in your locality and find out from them about the various ways in which they provide finance to business enterprises. Find out about the types of securities the banks accepts for such finance.

2.4 Summary

- Every business requires money to start and run the business. 'Business finance' refers to the money required for business purpose and the ways by which it is raised.
- Every business needs funds to purchase fixed assets, must day-to-day expenses, to fund business growth, bridge the time gap between production and sales, to meet contingencies and to avail of business opportunities.
- The importance of finance has considerably increased in modern times due to need for large-scale operation, use of modern technology and promotion of sales.

Notes

- Based on the period for which the funds are required, business finance is classified as:
  - Short-term finance (for a period of less than one year)
  - Medium-term finance (for one year to five years)
  - Long-term finance (for more than five years).
- There are two sources of raising the required funds by the business (i) internal source – owner's capital, retained earnings, and (ii) external source-friends and relatives, banks, other financial institutions, money lenders, capital market, etc.
- Methods of raising long-term finance are:
  - Issue of Shares
  - Issue of Debentures
  - Loans from financial institutions
  - Public Deposits
  - Retention of Profit
  - Term loans form Banks
  - Lease Financing
- Methods of Raising short-term finance are:
  - Commercial Papers (CPs)
  - Certificates of Deposit
  - Treasury Bills
  - Inter-Corporate Deposits (ICDS)
  - Trade Credit
  - Deferred Income
  - Commercial Banks
  - Factoring etc.

2.5 Keywords

Accruals: Accrued expenses are those expenses which the company owes to the other persons or organisations, but not yet due and not yet paid the amount.

Commercial Paper: It represents a short-term unsecured promissory note issued by firms that have a fairly high credit (standing) rating.

Deferred Income: Deferred incomes are incomes received in advance by the firm for supply of goods or services in future period.

Equity Share: Equity means 'equal'. Equity share is a share that gives equal right to holders.

Factoring: Factoring is a financial service covering the financing and collection of book debts and receivables arising from credit sale of goods and services, both in the domestic as well as international market.

Inter-corporate Deposits (ICDs): A deposit made by one firm with another firm is known as Inter-corporate Deposits (ICDs).

Notes

Preference Share: Preference share capital gives certain privileges to its holders on the equity shareholders.

Retained Earnings: These are the portion of earnings available to equity shareholders, which are ploughed back in the company.

Trade Credit: It refers to the credit extended by the supplier of goods or services to his/her customer in the normal course of business.

2.6 Self Assessment

Fill in the blanks:

1. Trade credit is a ..... source of short-term finance.
2. ..... income is income received in advance by the firm for supply of goods in future.
3. CPs are sold at ..... and redeemed at ..... .
4. A firm cannot issue public deposits for more than ..... of its share capital and free reserves.
5. ..... interest rate ceiling on public deposits.
6. ..... is the smallest unit into which the total capital of the company is divided.
7. As preference share capital lies between debenture capital and equity share capital with regards to claim on assets and income of the company hence, it is called as ..... .
8. ..... facility is an agreement between the borrower and the banker, where the borrower is allowed to withdraw funds in excess of the balance in his/her current accounts up to a certain limit during a specified period.
9. Treasury bills were first issued by the Indian government in ..... .

State whether the following statements are true or false:

10. Minimum size of CP is ₹ 6 lakhs.
11. Public deposits are governed by the Companies (Acceptance of Deposits) Amendment Rules 1978.
12. There are three types of inter-corporate deposits.
13. A share is a small unit of capital of a company.
14. Preference share capital gives certain privileges to its holders on the equity shareholders.
15. Participatory preference share holders have the right to participate in company meetings.
16. Bonds are issued for short-term Finance

2.7 Review Questions

1. "Is Trade Credit a source of finance". Discuss.
2. "Accruals are free source of finance", comment.
3. Write a brief note on CP as a source of finance.
4. What is public deposit? Discuss its advantages and disadvantages.

Notes

5. Discuss the types of ICD's.
6. Write a brief note on public deposits.
7. What is factoring? List out its features.
8. Briefly discuss the sources of short-term finance.
9. Discuss in detail the sources of long-term finance.
10. What are the sources of working capital finance? Discuss.
11. Write short note on (a) CP's, (b) Trade Credit and (c) Accruals.

Answers: Self Assessment

1.	Spontaneous	2.	Differed
3.	Discount, face value	4.	25%
5.	15%	6.	Share
7.	"senior security"	8.	Overdraft
9.	1917	10.	False
11.	True	12.	True
13.	True	14.	True
15.	False	16.	False

2.8 Further Readings

Books

Chandra, P., *Financial Management - Theory and Practice*, New Delhi, Tata McGraw Hill Publishing Company Ltd., 2002, p. 3.

Sudhindra Bhat, *Financial Management*, New Delhi, Excel Books, 2008.

Van Horne, J.C. and Wachowicz, Jr, J.M., *Fundamentals of Financial Management*, New Delhi, Prentice Hall of India Pvt. Ltd., 1996, p. 2.

Online links

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Unit 3: Time Value of Money

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Objectives

After studying this unit, you will be able to:

- Discuss compounding value concept
- Describe discounting value concept

Introduction

It has been explained in the preceding unit that Maximization of the shareholder's wealth is the basic objective of the finance manager of a firm. This requires him to take appropriate decisions on financing, investment and dividends. While taking these decisions, the finance manager must keep the "Time factor" in mind.

Example:

1. When interest on funds raised will have to be paid.
2. When return on investment will be received.
3. Whether it will be received on a consistent basis or otherwise etc.

All this requires that the finance manager knows about the various valuation concepts, viz., Compound Value Concept, Annuity Concept, Present Value Concept etc. All these concepts are basically based upon the fact that, money has time value.

Notes

3.1 Meaning of Time Value of Money

"Money has time value" means that the value of money changes over a period of time. The value of a rupee, today is different from what it will be, say, after one year.

Money has a time value because of the following reasons:

1. Individuals generally prefer current consumption to future consumption.
2. An investor can profitably employ a rupee received today, to give him a higher value to be received tomorrow or after a certain period of time.
3. In an inflationary economy, the money received today, has more purchasing power than money to be received in future.
4. 'A bird in hand is worth two in the bush' : This statement implies that, people consider a rupee today, worth more than a rupee in the future, say, after a year. This is because of the uncertainty connected with the future.

Thus, the fundamental principle behind the concept of time value of money is that, a sum of money received today, is worth more than if the same is received after some time.

Example: If an individual is given an alternative either to receive ₹ 10,000 now or after six months; he will prefer ₹ 10,000 now. This may be because, today, he may be in a position to purchase more goods with this money than what he is going to get for the same amount after six months.

Time value of money or time preference of money is one of the central ideas in finance. It becomes important and is of vital consideration in decision making. This will be clear with the following example.

Example: A project needs an initial investment of ₹ 1,00,000. It is expected to give a return of ₹ 20,000 p.a. at the end of each year, for six years. The project thus involves a cash outflow of ₹ 1,00,000 in the 'zero year' and cash inflows of ₹ 20,000 per year, for six years. In order to decide, whether to accept or reject the project, it is necessary, that the present value of cash inflows received annually for six years is ascertained and compared with the initial investment of ₹ 1,00,000. The firm will accept the project only when the present value of the cash inflows at the desired rate of interest is at least equal to the initial investment of ₹ 1,00,000.

3.2 Valuation Concepts or Techniques

The time value of money implies that:

1. a person will have to pay in future more, for a rupee received today and
2. a person may accept less today, for a rupee to be received in the future.

The above statements relate to two different concepts:

1. Compound Value Concept
2. Discounting or Present Value Concept

3.3 Compound Value Concept

In this concept, the interest earned on the initial principal amount becomes a part of the principal at the end of a compounding period.

Notes

Illustration 1: ₹ 1,000 invested at 10% is compounded annually for three years, Calculate the Compounded value after three years.

Solution:

Amount at the end of 1st year will be: 1,100

[1000 x 110/100 = 1,100]

Amount at the end of 2nd year will be: 1,210

[1100 x 110/100 = 1,210]

Amount at the end of 3rd year will be: 1,331

[1210 x 110/100 = 1,331]

This compounding process will continue for an indefinite time period.

Compounding of Interest over 'N' years: The compounding of Interest can be calculated by the following equation.

$A = P (1 + i)^n$

In which,

A = amount at the end of period 'n'.

P = Principal at the beginning of the period.

I = Interest rate.

N = Number of years.

By taking into consideration, the above illustration we get,

$A = P (1+i)^n$

$A = 1000 (1 + .10)^3$

A = 1,331

Note Computation by this formula can also become very time consuming if the number of years increase, say 10, 20 or more. In such cases to save upon the computational efforts, Compound Value table* can be used. The table gives the compound value of ₹ 1, after 'n' years for a wide range of combination of 'I' and 'n'.

For instance, the above illustration gives the compound value of ₹ 1 at 10% p.a. at the end of 3 years as 1.331, hence, the compound value of ₹ 1000 will amount to :

10001 × 331 = ₹ 1331

3.3.1 Multiple Compounding Periods

Interest can be compounded, even more than once a year. For calculating the multiple value above, logic can be extended. For instance, in case of Semi-annual compounding, interest is paid twice a year but at half the annual rate. Similarly in case of quarterly compounding, interest rate effectively is 1/4th of the annual rate and there are four quarter years.

Formula:

Notes

$$A = P\left[1+\frac{i}{m}\right]^{m\times n}$$

Where,

A = Amount after a period.

P = Amount in the beginning of the period.

I = Interest rate.

M = Number of times per year compounding is made.

n = Number of years for which compounding is to be done.

3.3.2 Future Value of Series of Cash Flows

So far we have considered only the future value of a single payment made at time zero. The transactions in real life are not limited to one. An investor investing money in installments may wish to know the value of his savings after 'n' years.

Illustration 2: Mr. Manoj invests ₹ 500, ₹ 1,000, ₹ 1,500, ₹ 2,000 and ₹ 2,500 at the end of each year. Calculate the compound value at the end of 5 years, compounded annually, when the interest charged is 5% p.a.

Solution:

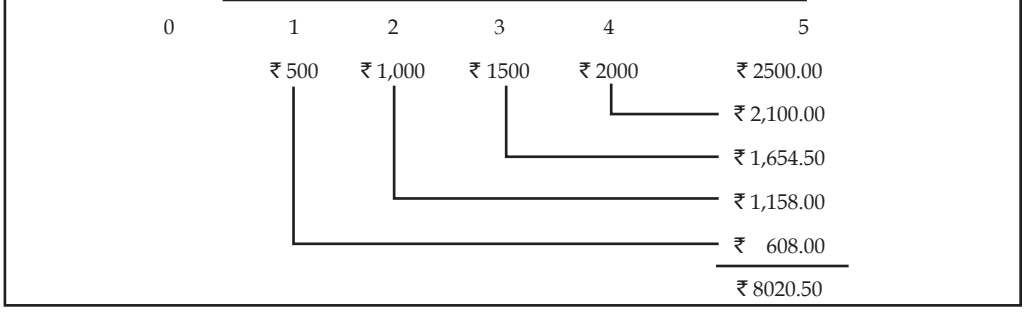
Statement of the compound value

End of year	Amount deposited	Number of years compounded	Compounded Interest factor from Table A – 1	Future Value (2) X (4)
1	**2**	**3**	**4**	**5**
1	₹ 500	4	1.216	₹ 608.00
2	1,000	3	1.158	1158.00
3	1,500	2	1.103	1,654.50
4	2,000	1	1.050	2,100.00
5	2,500	0	1.000	2,500.00

Amount at the end of the 5th Year ₹ 8020.50

It may be noted here, that we are making use of the Compound interest formula for each payment separately. For instance, ₹ 500 put at the end of the first year, compounds for four years, and has a future value of ₹ 608 at 5% interest [₹500 $(1 + 0.05)^4$]. Similarly, ₹ 1,000 deposited at n = 2 compounds for 3 years, amounts to ₹ 1,158 [₹ $1000(1+0.05)^3$] and so on.

Graphic illustration of Compounding Values



Notes

3.3.3 Compound Sum of an Annuity

An annuity is a stream of equal annual cash flows. Annuities involve calculations based upon the regular periodic contribution or receipt of a fixed sum of money.

Example: Mr Ramesh deposits ₹ 2,000 at the end of every year for 5 years in his saving account, paying 5% interest compounded annually. Determine the sum of money, he will have at the end of the 5th year.

Solution:

End of Year	Amount Deposited	Number of Years compounded	Compounded Interest factor From Table 3	Future Sum
1	2	3	4	5
1	₹ 2,000	4	1.216	₹ 2,432
2	2,000	3	1.158	2,316
3	2,000	2	1.103	2,206
4	2,000	1	1.050	2,100
5	2,000	0	1.000	2,000

Amount at the end of 5th Year ₹ 11,054

Finding the common factor of ₹ 2,000

= ₹ 2,000 × (1.216+1.158+1.103+1.050+1.000)

= ₹ 2,000 × (5.527)

= ₹ 11,054

The above illustration depicts that in order to find the sum of the annuity, the annual amount must be multiplied by the sum of the appropriate compound interest factors. Such calculations are available for a wide range of I and n. They are given in Table A – 2. To find the answer to the annuity question of illustration 3 we are required to look for the 5% column and the row for the five years and multiply the factor y annuity amount of ₹ 2000. From the table we find that the sum of annuity of ₹ 1 deposited at the of each year for 5 years is 5.526(IF). Thus, when multiplied by ₹ 2,000 annuity (A) we find the total sum as ₹ 11,052.

Symbolically S_n = IF × A

Where, A = is the value of annuity.

IF = represents the appropriate factor for the sum of the annuity of ₹1.

S_n = represents the compound sum of annuity.

Annuity tables are great innovations in the field of investment banking as they guide the depositors and investors as to what sum amount (X) paid for number of years, n, will accumulate to, at a stated rate of compound interest.

Example: Find the compound value of annuity, when three equal yearly payments of ₹ 25,000 are deposited into an account, that yields 7% compound interest.

Solution:

The Annuity Table (i.e. Table A – 2) gives the compound value as 3,215, when ₹1 is paid every year for 3 years at 7%. Thus, the compounded value of annuity of ₹ 2,000 is:

S_n = IF × A

S_n = 3.215 × 2000

S_n = 6,430

Notes

3.4 Discounting or Present Value Concept

The concept of present value is the exact opposite of that of a sum of money or series of payments, while in case of present value concept, we estimate the present worth or a future payment/ instalment or series of payment adjusted for the time value of money.

The basis of present value approach is that, the opportunity cost exist for money lying idle. That is to say, that interest can be earned on the money. This return is termed as 'discounting rate'.

Caution Given a positive rate of interest, the present value of the future Rupee will always be lower. The technique for finding the present value is termed as 'discounting'.

Present value after 'n' Years:

Formula:

$$PV = \frac{A}{(1+i)^n}$$

Where,

PV = principal amount the investor is willing to forego at present

I = Interest rate.

A = amount at the end of the period 'n'.

N = Number of years.

With this formula, we can directly calculate the amount; any depositor would be willing to sacrifice at present, with a time preference rate or discount rate of x%.

Example: If Mr. X, depositor, expects to get ₹ 100 after one year, at the rate of 10%, the amount he will have to forego at present can be calculated as follows:

$$PV = \frac{A}{(1+i)^n}$$

$$PV = \frac{100}{(1+.10)} = \text{Rs. } 90.90$$

Similarly, the present value of an amount of inflow at the end of 'n' years can be computed.

Present Value of a Series of Cash Flows

In a business situation, it is very natural that returns received by a firm are spread over a number of years. An investment made now may fetch returns a certain time period. Every businessman will like to know whether it is worthwhile to invest or forego a certain sum now, in anticipating of returns he expects to earn over a number of years. In order to take this decision he needs to equate the total anticipated future returns, to the present sum he is going to sacrifice. The estimate of the present value of future series of returns, the present value of each expected inflow will be calculated.

Notes

The present value of series of cash flows can be represented by the following:

$$PV = \frac{C_1}{(1+i)^1} + \frac{C_2}{(1+i)^2} + \frac{C_3}{(1+i)^3} + \frac{C_n}{(1+i)^n}$$

$$PV = \sum_{T=1}^{n} \frac{C_t}{(1+i)^n}$$

Where,

PV = Sum of individual present values of each cash flow : C_1, C_2, C_3.....

C_n = Cash flows after period 1, 2, 3……n.

I = Discounting rate.

However, a project may involve a series of cash inflows and outflows. The computation of the present value of inflows by the above equation is a tedious problem. Hence , present value Table is used (i.e. Table A – 3).

Illustration 3: Given the time value of money as 10% (i.e. the discounting factor), you are required to find out the present value of future cash inflows that will be received over the next four years.

Year	Cash flows (₹)
1	1,000
2	2,000
3	3,000
4	4,000

Solution:

Present Value of Cash flows

1 Year	2 Cash flows	3 Present Value Factor at 10%	4(2x3) Present Value
1	1,000	0.909	909
2	2,000	0.826	1,652
3	3,000	0.751	2.253
4	4,000	0.683	2,732
Present value of series of Cash flows	7,546		

Present Value of an Annuity

In the above case there was a mixed stream of cash inflows. An individual or depositor may receive only constant returns over a number of years. This implies that, the cash flows are equal in amount. To find out the present value of annuity either, we can find the present value of each cash flow or use the annuity table. The annuity table gives the present value of an annuity of Re. 1 for interest rate 'r' over number of years 'n'.

Notes

Example: Calculate the present value of annuity of ₹ 500 received annually for four years, when the discounting factor is 10%.

Solution:

Present Value of Annuity of ₹ 500

1 Year	2 Cash flows	3 Present Value Factor at 10%	4(2x3) Present Value
1	500	0.909	454.50
2	500	0.827	413.50
3	500	0.751	375.50
4	500	0.683	341.50
		3,170	
Present value of series of Cash flows ₹ 500		1,585.00	

This basically means to add up the Present Value Factors and multiply with ₹ 500.

i.e. 3,170 × 500 = ₹ 1,585.

Formula for calculation of the present value of an annuity can be derived from the formula for calculating the present value of a series of cash flows:

$$PVA_n = \frac{C_1}{(1+i)^1} + \frac{C_2}{(1+i)^2} + \frac{C_3}{(1+i)^3} + \frac{C_n}{(1+i)^n}$$

$$= C\left(\frac{1}{(1+i)^1} + \frac{1}{(1+i)^2} + \frac{1}{(1+i)^3} + \frac{1}{(1+i)^n}\right)$$

$$= C\left(\sum_{t=1}^{n} \frac{Ct}{(1+i)^n}\right)$$

Where,

PVA_n = Present value of an annuity having a duration of 'n' periods.

A = value of single instalment.

I = Rate of interest.

However, as stated earlier, a more practical method of computing the present value would be to multiply the annual instalment with the present value factor.

$$PVA_n = A \times ADF$$

Where ADF denotes Annuity Discount Factor. The PVA_n in the above example can be calculated as 500 × 3.170 = ₹ 1,585.

The figure of 3,170 has been picked up directly from the Annuity Table for present value (Table A – 4).

Example: Find out the present value of an annuity of ₹ 5,000 over 3 years when discounted at 5%.

Solution: PVA_n = A × ADF

= 5000 × 2.773

= 13,865

Notes

Present Value of a Perpetual Annuity

A person may like to find out the present value of his investment, in case he is going to get a constant return year after year. An annuity of this kind which goes on for ever is called a 'perpetuity'.

The present value of a perpetual annuity can be ascertained by simply dividing 'A' by interest or discount rate 'I', symbolically represented as A/i.

Illustration 4: Mr. Bharat, principal, wishes to institute a scholarship of ₹ 5,000 for an outstanding student every year. He wants to know the present value of investment which would yield ₹ 5,000 in perpetuity, discounted at 10%.

Solution:

$$P = \frac{A}{1} = \frac{5000}{.10} = 50,000$$

Illustration 5: Mr. Nandan intends to have a return of ₹ 10,000 p.a. for perpetuity, Incase the discount rate is 20%, calculate the present value of this perpetuity.

Solution:

$$P = \frac{A}{i} = \frac{10,000}{.20} = 50,000$$

This means that, Mr. Nandan should invest ₹ 50,000 at 20% to get an annual return of ₹ 10,000 for perpetuity.

3.5 Practical Implications of Compounding and Discounting Value Concepts

Compound Interest

Illustration 6: Suppose you have ₹ 10,00,000 today, and you deposit it in a financial institute, which pays you 8 per cent compound interest annually for a period of 5 years. Show how the deposit would grow.

Solution:

$$C^v_n = P_o (1 + I)^n$$

$$FV_5 = 10,00,000(1+0.08)^5 = 10,00,000\ (1.469)$$

$$FV_5 = ₹\ 14,69,000$$

Note: See the compound value for one rupee Table for 5 years at 8 per cent rate of interest.

Variable Compounding Periods

Illustration 7 (Semi annual compounding): How much does a deposit of ₹ 40,000 grow in 10 years at the rate of 6 per cent interest and compounding is done semi-annually. Determine the amount at the end of 10 years.

Solution:

$$CV_{10y} = ₹\ 40,000\left(1+\frac{0.06}{2}\right)^{2\times 10}$$

$$= ₹\ 40,000\ [1.806] = ₹\ 72,240$$

Note: See the compound value for one rupee Table for year 20 and at 3 per cent interest rate.

Notes

Illustration 8 (Quarterly compounding): Suppose a firm deposits ₹ 50 lakhs at the end of each year, for 4 years at the rate of 6 per cent interest and compounding is done on a quarterly basis. What is the compound value at the end of the 4th year.

Solution:

$$FV_4 = ₹\,50{,}000{,}000\left(1+\frac{0.06}{4}\right)^{4\times4}$$

$$= ₹\,50{,}00{,}000\ [FVIF_{3y....8y}]$$

$$= ₹\,50{,}00{,}000 \times 1.267 = ₹\,63{,}35{,}000$$

Calculation of the Compound Growth Rate

Compound growth rate can be calculated with the following formula:

$$g_r = V_o(1 + r)^n = V_n$$

where,

g_r = Growth rate in percentage.

V_o = Variable for which the growth rate is needed (i.e., sales, revenue, dividend at the end of year '0').

V_n = Variable value (amount) at the end of year 'n'.

$(1 + r)^n$ = Growth rate.

Illustration 9: From the following dividend data of a company, calculate compound rate of growth for period (1998 – 2003).

Year	1998	1999	2000	2001	2002	2003
Dividend per share (₹)	21	22	25	26	28	31

Solution:

$$21\ (1 + r)^5 = 31$$

$$(1 + r)^5 = 31/21 = 1.476$$

Note: See the compound value one rupee Table for 5 years (total years – one year) till you find the closest value to the compound factor, after finding the closest value, see first above it to get the growth rate.

Compounded/Future Value of Series of Cash Flows [Annuity]

Illustration 10: Mr. Bhat deposits each year ₹ 5000, ₹ 10000, ₹ 15000, ₹ 20000 and ₹ 25000 in his savings bank account for 5 years at the interest rate of 6 per cent. He wants to know his future value of deposits at the end of 5 years.

Solution:

$$CV_n = 5000(1+0.06)^4+10000(1+0.06)^3+15000(1+0.06)^2+20000(1+0.06)^1+25000(1+0.06)^0$$

$$CV_5 = 5000(1.262)+10000(1.191)+15000(1.124)+20000(1.050)+25000(1.00)$$

$$= 6310 + 11910 + 16860 + 21000 + 25000 = ₹\,81{,}080/-$$

Notes

CV can also be calculated in the following ways:

Year	Amount paid ₹	No. of years compounded	Compound interest factor	Future value ₹
(1)	(2)	(3)	(4)	(5) = (2) x (4)
1	5000	4	1.262	6,310
2	10,000	3	1.191	11,910
3	15,000	2	1.124	16,860
4	20,000	1	1.05	21,000
5	25,000	0	1.00	25,000
Total				81,080

Compound Value of Annuity (Even Cash Flows)

Illustration 11: Mr. Ram deposits ₹ 500 at the end of every year, for 6 years at 6 per cent interest. Determine Ram's money value at end of 6 years.

Solution:

$$FV_n = P_1 (1+I)^{n-1} + P_2 (1+I)^{n-2} + \text{----------}P_{n-1}(1+I)+P^{n-n}$$

$$FV_6 = 500(1+0.06)^5+500(1+0.06)^4+500(1+0.06)^3+500(1+0.06)^2+500(1+0.06)^1 + 500(1+0.06)^0$$

$$= 500(1.338) + 500(1.262) + 500(1.19) + 500(1.124) + 500(1.060) + 500(1.00)$$

$$= 669 + 631 + 595.5 + 562 + 530 + 500 = ₹\ 3487.5$$

By using table format,

Year	Amount Paid ₹	No. of years compounded	Compound interest factor	Future value ₹
1	500	5	1.338	669.00
2	500	4	1.262	631.00
3	500	3	1.191	595.50
4	500	2	1.124	562.00
5	500	1	1.06	530.00
6	500	0	1.00	500.00
Total				**3,487.50**

Short-cut formula

$$CV_n = P\left[\frac{(1 + I)^n - 1}{I}\right]$$

Where,

P = Fixed periodic cash flow.

I = Interest rate.

n = Duration of the amount.

$$\frac{(1+I)^n - 1}{1} = (FVIFA_{I.n})$$

$(FVIFA_{I.n})$ = Future value for interest factor annuity at 'I' interest and for 'n' years.

Illustration 12: Take the above example.

$$CV_6 = 500\left(\frac{(1+0.06)^6 - 1}{0.06}\right)$$

Notes

= 500 [6.975] = ₹ 3487 = 50

Note: See the compound value of annuity table of one rate for 6 years at 6 per cent interest.

Compound Value of Annuity Due

Illustration 13: Suppose you deposit ₹ 2500 at the beginning of every year for 6 years in a saving bank account at 6 per cent compound interest. What is your money value at the end of the 6 years.

Solution:

$$CV_6 = 2500 \left(\frac{(1+0.06)^6 - 1}{0.06} \right) (1 + 0.06)$$

$$= 2500\ (6.975)\ (1 + 0.06) = ₹\ 18{,}483.75$$

Through the Table format

Year	Cash outflow ₹	No. of times compounded	Compound factor	Compound value (₹)
1	2500	6	1.419	3,547.50
2	2500	5	1.338	3,345.00
3	2500	4	1.262	3,155.00
4	2500	3	1.191	2,977.50
5	2500	2	1.124	2,810.00
6	2500	1	1.06	2,650.00
	Total			**18,485.00**

Doubling Period

Doubling period is the time required, to double the amount invested at a given rate of interest. For example, if you deposit ₹ 10,000 at 6 per cent interest, and it takes 12 years to double the amount. (see compound value for one rupee table at 6 per cent till you find the closest value to 2).

Doubling period can be computed by adopting two rules, namely:

1. ***Rule of 72*:** To get doubling period 72 is divided by interest rate.

   Doubling period (D_p) = 72 ÷ I

   Where,

   I = Interest rate.

   D_p = Doubling period in years.

Illustration 14: If you deposit ₹ 500 today at 10 per cent rate of interest, in how many years will this amount double?

Solution:

D_p = 72 ÷ I = 72 ÷ 10 = 7.2 years (approx.)

2. ***Rule of 69* :** Rule of 72 may not give the exact doubling period, but rule of 69 gives a more accurate doubling period. The formula to calculate the doubling period is:

   D_p = 0.35 + 69 / I

Notes

Illustration 15: Take the above problem as it is and calculate doubling period.

Solution:

D_p = 0.35 + 69 / 10 = 7.25 years.

Effective Rate of Interest in Case of Doubling Period

Sometimes investors may have doubts as to what is the effective interest rate applicable, if a financial institute pays double amount at the end of a given number of years.

Effective rate of interest can be defined by using the following formula.

(a) ***In case of rule of 72***

ERI = 72 per cent / Doubling period (D_p)

where,

ERI = Effective rate of interest.

D_p = Doubling period.

Illustration 16: A financial institute has come with an offer to the public, where the institute pays double the amount invested in the institute by the end of 8 years. Mr. A, who is interested to make a deposit, wants to know the affective rate of interest that will be given by the institute Calculate:

Solution:

ERI = 72 ÷ D_p = 72 ÷ 8 years = 9 per cent

(b) ***In case of rule of 69***

$$ERI = \frac{69}{D_p} + 0.35$$

Take the above example:

$$ERI = \frac{69}{8 \text{ years}} + 0.35$$

= 8.98 per cent or 9 per cent

Present Value

Illustration 17: An investor wants to find the present value of ₹ 40,000, due 3 years. His interest rate is 10 per cent.

Solution:

$$P_v = FV_3\left(\frac{1}{1+I}\right)^3$$

$$= ₹\ 40{,}000\left(\frac{1}{(1+0.10)}\right)^3$$

= ₹ 40,000 [0.751] = ₹ 30,040

Note: Present value of one rupee Table at 3 years for the rate of 10 per cent.

Present Value of a Series of Cash Flows

Notes

Illustration 18: From the following information, calculate the present value at 10 per cent interest rate.

Year	0	1	2	3	4	5
Cash inflow (₹)	2,000	3,000	4,000	5,000	4,500	5,500

Solution:

$$P_v = \frac{2000}{(1+0.10)^0} + \frac{3000}{(1+0.10)^1} + \frac{4000}{(1+0.10)^2} + \frac{5000}{(1+0.10)^3} + \frac{4500}{(1+0.10)^4} + \frac{5500}{(1+0.10)^5}$$

= 2000 + 2727 + 3304 + 3755 + 3073.5 + 3415.5 = ₹ 18.275

Present value can also be calculated by the following way:

Years	Cash inflow (₹)	PV Factor 10 per cent	Present value (₹)
0	2000	1.00	2000.0
1	3000	0.909	2727.0
2	4000	0.826	3304.0
3	5000	0.751	3755.0
4	4500	0.683	3073.5
5	5500	0.621	3415.5
Total present value			**18275.0**

(c) ***Present value of even cash flows (annuity)***

Present Value of Deferred Annuity

$$PVA_n = \frac{CIF_1}{(1+I)^1} + \frac{CIF_2}{(1+I)^2} + \ldots\ldots\ldots\ldots \frac{CIF_n}{(1+I)^{n-1}} + \frac{CIF}{(1+I)^n}$$

or

$$CIF\left(\frac{(1+I)^n - 1}{I(1+I)^n}\right) = CIF(PVIFA_{1.n})$$

Where,

PVA = Present value of annuity.

I = Discounting factor or interest rate.

CIF = Cash inflows.

n = Duration of the annuity.

Illustration 18: Mr. Bhat wishes to determine the PV of the annuity consisting of cash flows of ₹ 40,000 per annum for 6 years. The rate of interest he can earn from this investment is 10 per cent.

Solution:

= ₹ 40,000 × $PVIFA_{I.n}$

= ₹ 4000 × 4.355 = ₹ 17,420

Note: See present value of annuity table for 6 year at 10 per cent.

Notes

Alternate way to find present value

Years	Cash inflow (₹)	PV Factor 10 per cent	Present value (₹)
1	4000	0.91	3640
2	4000	0.826	3304.0
3	4000	0.751	3004.0
4	4000	0.683	2732.0
5	4000	0.621	2484.0
6	4000	0.564	2256.0
PV of Annuity			**17420**

Alternate way

Years	Cash inflow (₹)	PV factor at 10 per cent	PV (₹)
1 to 6	4000	4.355	17,420

Present value of Annuity Due

$PVA_n = CIF\ (FVIF_{I.n})\ (1 + I)$ **or**

$$PVA_n = CIF\left(\frac{1-(1+I)^{-n}}{I}\right)(1+I)$$

Illustration 20: Mr. Bhat has to receive ₹ 500 at the beginning of each year, for 4 years. Calculate personal value of annuity due, assuming 10 per cent rate of interest.

Solution:

PVA_4 = ₹ 500 (3.170) × (1.10) = ₹ 1743.5

Alternatively

Years	Cash inflow (₹)	PV Factor at 10 per cent	Present value (₹)
1	500	1.00	500.0
2	500	0.909	454.5
3	500	0.826	413.0
4	500	0.751	375.5
PV of Annuity			**1743.0**

Effective vs Nominal Rate

The nominal rate of interest or rate of interest per year is equal. Effective and nominal rate are equal only when the compounding is done yearly once, but there will be a difference, that is, effective rate is greater than the nominal rate for shorter compounding periods. Effective rate of interest can be calculated with the following formula.

$$ERI = \left(1+\frac{I}{m}\right)^m - 1$$

Where,

I = Nominal rate of interest.

m = Frequency of compounding per year.

Illustration 21: Mr. X deposited ₹ 1000 in a bank at 10 per cent of the rate of interest with quarterly compounding. He wants to know the effective rate of interest.

Notes

Solution:

$$ERI = \left(1 + \frac{0.10}{4}\right)^4 - 1$$

= 1.1038 – 1 = 0.1038 or 10.38 per cent.

Sinking Fund Factor

The financial manager may need to estimate the amount of annual payments so as to accumulate a predetermined amount after a future date, to purchase assets or to pay a liability. The following formula is useful to calculate the annual payment.

$$A_p = FVA_n \left(\frac{I}{(1+I)^n - 1}\right)$$

Where,

A_p = Annual payment.

VA_n = Future value after 'n' years.

I = Interest rate.

$$\left(\frac{I}{(1+I)^n - 1}\right) = FVIFA_{I.n}$$

Illustration 22: The finance manager of a company wants to buy an asset costing ₹ 1,00,000 at the end of 10 years. He requests to find out the annual payment required, if his savings earn an interest rate of 12 per cent per annum.

Solution:

$$A_p = 1,00,000 \left(\frac{0.12}{(1+0.12)^{10} - 1}\right)$$

= 1,00,000 (0.12 or 2/2.1058) = ₹ 5698.5

$$A_p = 1,00,000 \times \frac{1}{FVIFA_{12\%.10y}}$$

$$= 1,00,000 \times \frac{1}{17.548}$$

= ₹ 5698.65

Present Value of Perpetuity

Perpetuity is an annuity of infinite duration. It may be expressed as:

$$PV_\infty = CIF \text{ X } PVIFA_{I.\infty}$$

Where,

PV_∞ = Present value of a perpetuity.

CIF = constant annual cash inflow.

$PVIFA_{I.\infty}$ = PV interest factor for a perpetuity.

PV_∞ = CIF/I

Notes

Illustration 23: Mr. Bhat an investor, expects a perpetual amount of ₹ 1000 annually from his investment. What is his present value of this perpetuity if the interest rate is 8 per cent?

Solution:

$$PV_{\infty} = CIF/I = 1000/0.08 = ₹\ 12{,}500$$

Loan Amortisation

Loan is an amount raised from outsiders at an interest and repayable at a specified period (lumpsum) or in installments. The repayment of loan is known as amortisation. A financial manager may take a loan and he may interested to know the amount of equal instalment to be paid every year to repay the complete loan amount including interest. Instalment can be calculated with the following formula:

$$L_I = P_A\left(\frac{I(1+I)^n}{(1+I)^n - 1}\right)$$

or

$$L_I = P_A \div PVIFA_{n.I}$$

Where,

L_I = Loan installment.

P_A = Principal amount.

I = Interest rate.

n = Loan repayment period.

$PVIFA_{n.I}$ = PV interest factors at loan repayment period at a specified interest rate.

Illustration 24: ABC Company took a loan of ₹ 10,00,000 lakh for an expansion program from IDBI at 7 per cent interest per year. The amount has to be repaid in 6 equal annual installments. Calculate the per instalment amount.

Solution:

$$L_I = 10{,}00{,}000\left(\frac{0.06(1+0.06)^6}{(1+0.06)^6 - 1}\right)$$

or

$$L_I = 10{,}00{,}000 \div PVIFA_{7\%.6y}$$

$$= 10{,}00{,}000 \div 4.769 = ₹\ 2{,}09{,}687.56$$

Present Value of Growing Annuity

Growing annuity means the cash flow that grows at a constant rate for a specified period of time. In others, the cash flow grows at a component rate.

Steps involved in calculation:

1. Calculate the series of cash flows.
2. Convert the series of cash flows into present values at a given discount factor.
3. Add all the present values, of series of cash flows to get total PV of a growing annuity.

Formula

Notes

$$PVG_A = \frac{CIF}{(1+g)}\left(\frac{1-\frac{(1+g)^n}{(1+I)^n}}{(1-g)}\right)$$

Where,

PVG_A = PV of growing annuity.

CIF = Cash inflows.

g = Growth rate.

I = Discount factor.

n = Duration of the annuity.

Illustration 25: XYZ real estate agency has rented one of their apartment for 5 years at an annual rent of ₹ 6,00,000 with the stipulation that, rent will increase by 5 per cent every year. If the agency's required rate at return is 14 per cent. What is the PV of expected (annuity) rent?

Solution:

Step 1: Calculate on series of annual rent

Year	Amount of rent (₹)
1	6,00,000
2.	6,00,000 X (1 + 0.05) = 6,30,000
3.	6,30,000 X (1 + 0.05) = 6,61,500
4.	6,61,500 X (1 + 0.05) = 6,94,575
5.	6,94,575 X (1 + 0.05) = 7,29,303.75

Step 2: Calculate present values

Years	Cash inflow (₹)	Discounting Rate 14 per cent	Present value (₹)
1	600,000	0.877	526200.0
2	630,000	0.769	484470.0
3	661,500	0.675	446512.5
4	694,575	0.592	411188.4
5	729,303.75	0.519	378508.6
Total PV of Annuity			**22,46,879.55**

Shorter Discounting Periods

Generally cash flows are discounted once a year, but sometimes cash flows have to be discounted less than one (year) time, like, semi-annually, quarterly, monthly or daily. The general formula used for calculating the PV in the case of shorter discounting period is:

$$PV = CIF_n\left(\frac{1}{1+I/m}\right)^{m\times n}$$

Where,

PV = Present value.

CIF_n = Cash inflow after 'n' year.

Notes

m = No. of times per year discounting is done.

I = Discount rate (annual).

Illustration 26: Mr. A expected to receive ₹1,00,000 at the end of 4 years. His required rate of return is 12 per cent and he wants to know PV of ₹ 1,00,000 with quarterly discounting.

Solution:

$$PV = 1,00,000 \left(\frac{1}{1+0.12/4}\right)^{4\times4}$$

$$= 1,00,000 \times PVIF_{3\text{per cent } 4y}$$

$$= 1,00,000 \times 0.623 = ₹\ 62,300$$

Task Calculate the following:

1. Mr. A deposits at the end of each year ₹ 2000, ₹ 3000, ₹ 4000, ₹ 5000 and ₹ 6000 for the consequent 5 years respectively. He wants to know his series of deposits value at the end of 5 years with 6 per cent rate of compound interest.
2. A borrower offers 16 per cent rate of interest with quarterly compounding. Determine the effective rate of income.
3. What is the present value of ₹ 1,00,000, which is receivable after 60 years. If the investor required rate of interest is 10 per cent.

Case Study

Evolution of different Alternatives

The application of the time value of money principles can help you make decisions on loan alternatives. This exercise requires you to compare three mortgage alternatives using various combinations and points. Points on a mortgage refer to a payment that is made upfront to secure the loan. A single point is a payment of one per cent of the amount of the total mortgage loan. If you were borrowing ₹ 200,000 a single point would require an upfront payment of ₹ 2,000.

When you are evaluating alternative mortgages, you may be able to obtain a lower rate by making an upfront payment. This comparison will not include an after-tax comparison. When taxes are considered, the effective costs are affected by interest paid and the amortization of points on the loan. This analysis will require you to compare only before-tax costs.

Zeal.com allows you to compare the effective costs on alternative mortgages. You are considering three alternatives for a ₹ 250,000 mortgage. Assume that the mortgage will start in December, 2006. The mortgage company is offering you a 6% rate on a 30-year mortgage with no points. If you pay 1.25 points, they are willing to offer you the mortgage at 5.875%. If you pay 2 points, they are willing to offer you the mortgage at 5.75%.

Questions

1. What are the mortgage payments under the three alternatives?
2. Which alternative has the lowest effective cost?
3. Can you explain how the effective rate is being calculated?

Notes

3.6 Summary

- Time value of money means that the value of money changes over a time.
- It is the sum of money received today is worth more than if the same is received after some time.
- In compound value concept, the interest earned on the initial principal amount becomes a part of the principal at the end of a compounding period.
- Interest can be compounded even more than once a year.
- An investor investing money in installments may wish to know the value of his savings after 'n' years. This is called future value of series of cash flows.
- In case of present value concept, we estimate the present worth adjusted for the time value of money.

3.7 Keywords

Annuity: It is a stream of equal annual cash flows.

Cash Flow: It is the movement of cash into or out of a business, a project, or a financial product. It is usually measured during a specified, finite period of time

Compound Interest: When interest is added to the principal, so that from that moment on, the interest that has been added also itself earns interest.

Compound Value: The interest earned on the initial principal becomes a part of the principal at the end of a compounding period.

Present Value: In case of present value concept, we estimate the present worth of a future payment/instalment or series of payment adjusted for the time value of money.

Time Value of Money: Time value of money is that the value of money changes over a period of time.

3.8 Self Assessment

Fill in the blanks:

1. Simple interest (SI) = P_o (I) (.....).
2. According to dividend capitalization approach dividend is paid ..... .
3. An annuity is a stream of ..... annual flows.
4. ..... is repayment of loan over a period of time.
5. The nominal rate of interest and ..... per year is equal.

State whether the following statements are true or false:

6. Current consumption is one of the reasons for time preference of money.
7. Compound value and future value both, are same.
8. There are two rules available to find out double period.
9. Effective rate of interest is more than the nominal rate of interest in single period compounding.
10. Rule 73 is one of the rules of doubling period.

Notes

11. Cost of capital interest rate requires rate of return and discounting rate factor, all are used for calculating of PV of cash flows.
12. Compound growth rate formula is $V_o (1 + r) = V_n$.
13. A series of unequal cash flows are called Annuity.
14. 0.35 + 69/I is the formula used to calculate present value of perpetuity.
15. Cash flows are divided with interest (per cent) rate to calculate future value of perpetuity.

3.9 Review Questions

1. Mr. X deposited ₹ 1,00,000 in a savings bank account today, at 5 per cent simple interest for a period of 5 years. What is his accumulated interest?
2. Mr. X invested ₹ 40,000 today, for a period of 5 years. Calculate the future value if his required rate of returns is 10 per cent.
3. Suppose you deposit ₹ 1,00,000 with an investment company, which pays 10 per cent interest with semi annual compounding. What is the total deposit amount at the end of 5 years?
4. Mr. A deposits at the end of each year ₹ 2000, ₹ 3000, ₹ 4000, ₹ 5000 and ₹ 6000 for the consequent 5 years respectively. He wants to know his series of deposits value at the end of 5 years with 6 per cent rate of compound interest.
5. Assume you have been depositing each year for 5 years, the deposit amount of ₹ 100, ₹ 200, ₹ 300, ₹ 400 and ₹ 500 respectively. Calculate your deposits value if you get 7 per cent compound interest and assume you have deposited in the beginning of each year.
6. If you invest ₹ 500 today, at a compound interest of 9 per cent, what will be its future value after 60 years?
7. Explain the meaning and importance of valuation concept. How does valuation concept help in decision making?
8. Explain the rule of 69. How does it compare with the rule of 72?
9. "A bird in hand is more preferable than two birds in the bush". Explain.
10. A borrower offers 16 per cent rate of interest with quarterly compounding. Determine the effective rate of income.
11. A finance company has advertised saying that, it will pay a lumpsum of ₹ 44,650 at the end of 5 years to anyone who deposits ₹ 6000 per annum. Mr. A is interested, but he wants to know the implicit rate of interest.
12. What is the present value of ₹ 1,00,000, which is receivable after 60 years. If the investor required rate of interest is 10 per cent.

Answers: Self Assessment

1.	n	2.	Annually
3.	Equal	4.	Amortization
5.	Rate of interest	6.	True
7.	True	8.	True
9.	True	10.	False

Notes

11. True
12. False
13. False
14. False
15. False

3.10 Further Readings

Books

Chandra, P., *Financial Management - Theory and Practice*, New Delhi, Tata McGraw Hill Publishing Company Ltd., 2002, p. 3.

Sudhindra Bhat, *Financial Management*, New Delhi, Excel Books, 2008.

Van Horne, J.C. and Wachowicz, Jr, J.M., *Fundamentals of Financial Management*, New Delhi, Prentice Hall of India Pvt. Ltd., 1996, p. 2.

Online link

http://www.fei.org/

Notes

Unit 4: Cost of Capital

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Objectives

After studying this unit, you will be able to:

- Describe concept and significance of cost of capital
- Explain measurement of cost of equity shares, preference shares and debentures
- Define weighted average cost of capital

Introduction

The cost of capital is an important concept in formulating a firm's capital structure. Cost of capital is a central concept in financial management. It is also viewed as one of the corner stones in the theory of financial management. It has received considerable attention from both theorists and practitioners. Two major schools of thought have emerged having basic difference on the relevance of cost of capital. In one camp, Modigline Miller argued, that a firm's cost of capital is constant and it is independent of the method and level of financing. In another camp (traditionalists) cost of capital is varying and dependent on capital structure. In both the camps, optimal policy is taken as the policy that maximizes the value of a company.

Cost of capital is still largely an academic term and the problem of measuring it in operational terms is a recent phenomena. Prior to this development, the problem was either ignored or by passed. In modern times, it is widely used as basis of investment projects and evaluating the alternative sources of finance.

Notes

4.1 Cost of Capital – Concept

The term cost of capital is a concept having many different meanings. The three viewpoints, regarding the cost of capital is given below.

1. ***From Investors' View Point:*** Investor may define it as "the measurement of the sacrifice made by him in capital formation.

Example: Mr. A an investor invested in a company's equity shares, amount ₹ 1,00,000, instead of investing in a bank at the rate of 7 per cent interest. Here he had sacrificed 7 per cent interest for not having invested in the bank.

2. ***Firms Point:*** It is the minimum required rate of return needed to justify the use of capital.

Example: A firm raised ₹ 50 lakhs through the issues of 10 per cent debentures, for justifying this issue, a minimum rate of return it has to earn is 10 per cent.

3. ***Capital Expenditure Point:*** The cost of capital is the minimum required rate of return, the hurdle or target rate or the cut off rate or any discounting rate used to value cash flows.

Example: Firm 'A' is planning to invest in a project, that requires ₹ 20 lakh as initial investment and provides cash flows for a period of 5 years. So for the conversion of future 5 years cash flows into present value, cost of capital is needed.

Cost of capital represents the rate of return that the firm must pay to the fund suppliers, who have provided the capital. In other words, cost of capital is the weighted average cost of various sources of finance used by the firm. The sources are, equity, preference, long-term debt and short-term debt.

Meaning and Definition of Cost of Capital

"The rate that must be earned on the net proceeds to provide the cost elements of the burden at the time they are due."

– Hunt, William and Donaldson

"Cost of capital is the minimum required rate of earnings or the cut-off rate of capital expenditures."

– Solomon Ezra

The above definitions indicate that the following are the three basic aspects of the concept of cost of capital.

1. ***Rates of Return:*** Cost of Capital is not a Cost as such, infact it is the rate of return that a firm requires to earn from its investment projects.
2. ***Minimum Rate of Return:*** Cost of Capital of any firm is that minimum rate of return that will at least maintain the market value of the shares.
3. ***Cost of Capital Comprises three Components:***
   (a) The risk less cost of the particular type of financing (r_j)
   (b) The business risk premium, (b) and
   (c) The financial risk premium (f)

Note Symbolically cost of capital may be represented as: $K_o = r_j + b + f$

Notes

4.2 Significance of Cost of Capital

The concept of cost of capital is very important and the central concept in financial management decisions. The decisions in which it is useful are as follows:

1. ***Designing Optimal Corporate Capital Structure:*** This concept is helpful in formulating a sound and economical capital structure for a firm. The debt policy of a firm is significantly influenced by the cost consideration.

   Did u know? **What is capital structure?**

   Capital structure involves determination of proportion of debt and equity in capital structure that provides less cost of capital.

   While designing a firm's capital structure, the financial executives always keep in mind minimisation of the over all cost of capital and to maximise value of the firm. The measurement of specific costs of each source of funds and calculation of weighted average cost of capital help to form a balanced capital structure. By comparing various (sources of finance) specific costs, he/she can choose the best and most economical source of finance and can succeed in designing a sound and viable capital structure.

2. ***Investment Evaluation / Capital Budgeting:*** Wilson R.M.S., states that the Cost of Capital is a concept, which should be expressed in quantitative terms, if it is to be useful as a cut-off rate for capital expenses. Capital expenditure means investment in long-term projects like investment on new machinery. It is also known as Capital budgeting expenditure. Capital budgeting decisions require a financial standard (cost of capita) for evaluation.

3. ***Financial Performance Appraisal:*** Cost of capital framework can be used to evaluate the financial performance of top management. Financial performance evaluation involves a comparison of actual profitability of the investment project with the project overall cost of capital of funds raised to finance the project. If the actual profitability is more than the projected cost of capital, then the financial performance may said to be satisfactory and vice versa.

4.3 Measurement of Cost of Capital

Computation of cost of capital for various sources of finance, viz., equity, preference shares, debentures, retained earnings, public deposits is discussed below:

4.3.1 Cost of Equity

Firms may obtain equity capital in two ways (a) retention of earnings and (b) issue of additional equity shares to the public. The cost of equity or the returns required by the equity shareholders is the same in both the cases, since in both cases, the shareholders are providing funds to the firm to finance their investment proposals.

In the following cost of equity is computed in both sources point of view (i.e., retained earnings and issue of equity shares to the public).

Cost of Retained Earnings (K_{re})

Retained earnings are one of the internal sources to raise equity finance. Retained earnings are those part of (amount) earnings that are retained by the form of investing in capital budgeting proposals instead of paying them as dividends to shareholders.

Notes

Did u know? Cost of retained earnings = Required rate of return on equity

Corporate executives and some analysts too normally consider retained earnings as cost free, because there is nothing legally binding the firm to pay dividends to equity shareholders and the company has its own entity different from its stockholders. But it is not so. They involve opportunity cost. The opportunity cost of retained earning is the rate of return the shareholder forgoes by not putting his/her funds elsewhere, because the management has retained the funds. The opportunity cost can be well computed with the following formula.

$$K_{re} = K_e\left(\frac{(1-T_i)}{(1-T_b)}\right)\times 100$$

Where,

K_e = Cost of equity capital [D ÷ P or E/P + g].

T_i = Marginal tax rate applicable to the individuals concerned.

T_b = Cost of purchase of new securities/broker.

D = Expected dividend per share.

NP = Net proceeds of equity share/market price.

g = Growth rate in (%).

Illustration 1: A company paid a dividend of ₹ 2 per share, market price per share is ₹ 20, income tax rate is 60 per cent and brokerage is expected to be 2 per cent. Compute the cost of retained earnings.

Solution:

$$K_{re} = \left(\frac{D}{NP}\times\frac{(1-T_i)}{(1-T_b)}\right)\times 100$$

$$= \left(\frac{2}{20}\times\frac{(1-0.60)}{(1-0.02)}\right)\times 100$$

= 0.10 X 0.409 X 100 = 4.1 per cent

Illustration 2: ABC company's cost of equity (K_e) capital is 14 per cent, the average tax rate of individual shareholders is 40 per cent and it is expected that 2 per cent is brokerage cost that shareholders will have to pay while investing their dividends in alternative securities. What is the cost of retained earnings?

Solution:

$$K_{re} = \left(K_e\times\frac{(1-T_i)}{(1-T_b)}\right)\times 100$$

$$= 0.14\times\frac{(1-0.4)}{(1-0.02)}\times 100$$

= (0.14 X 0.613) X 100 = 8.6 per cent

Notes

Caution The cost of equity capital (K_e), may be defined as the minimum rate of returns that a firm must earn on the equity financed portions of an investment project in order to leave unchanged the market price of the shares. The cost of equity is not the out-of-pocket cost of using equity capital as the equity shareholders are not paid dividend at a fixed rate every year.

Approaches to Calculate the Cost of Equity (K_e)

There are six approaches available to calculate the cost of equity capital, they are:

Dividends Capitalisation Approach (D/MP Approach)

According to this approach, the cost of equity capital is calculated on the basis of a required rate of return in terms of the future dividends to be paid on the shares. Accordingly, K_e is defined as the discount rate that equates the present value of all expected future dividends per share, along with the net proceeds of the sale (or the current market price) of a share. It means investor arrives at a market price for a share by capitalizing dividends at a normal rate of return. The cost of equity capital can be measured by the given formula:

$$K_e = D/CMP \text{ or } NP$$

Where,

K_e = cost of equity

D = Dividends per share

CMP = Current market price per share

NP = Net proceed per share

Note This method assumes that investor give prime importance to dividends and risk in the firm remains unchanged and it does not consider the growth in dividend.

Illustration 3: XYZ Ltd., is currently earning ₹ 1,00,000, its current share market price of ₹ 100 outstanding equity shares is 10,000. The company decides to raise an additional capital of ₹ 2,50,000 through issue of equity shares to the public. It is expected to pay 10 per cent per share as floatation cost. Equity capital is issued at a discount rate of 10 per cent, per share. The company is interested to pay a dividend of ₹ 8 per share. Calculate the cost of equity.

Solution:

$$K_e = \frac{D}{NP} \times 100$$

$$K_e = \frac{Rs.8}{(100-10-10)} \times 100$$

$$K_e = \frac{Rs.8}{80} \times 100$$

$$= 10 \text{ per cent}$$

Notes

Earnings Capitalisation Approach (E/MP Approach)/Earning Price ratio Approach

According to this approach, the cost of equity (K_e) is the discount rate that equates the present value of expected future earnings per share with the net proceeds (or current market price) of a share.

Assumption of earnings capitalization approach is employed under the following conditions:

(a) Constant earnings per share over the future period;

(b) There should be either 100 per cent rotation ratio or 100 per cent dividend pay out ratio and,

(c) The company satisfies the requirements through equity shares and does not employ debt.

Cost of equity can be calculated with the following formula:

$$K_e = \frac{E}{CMP \text{ or } NP}$$

Where,

K_e = Cost of equity

E = Earnings per share

CMP = Current market price per share

NP = Net proceeds per share

Illustration 4: Well do company Ltd. is currently earning 15 per cent operating profit on its share capital of ₹ 20 lakh (FV of ₹ 200 per share). It is interested to go for expansion for which the company requires an additional share capital of ₹ 10 lakh. Company is raising this amount by the issue of equity shares at 10 per cent premium and the expected floatation cost is 5 per cent. Calculate the cost of equity.

Solution:

$$K_e = \frac{E}{NP} \times 100$$

$$= \frac{₹30}{(₹200 + 20 - 10)} \times 100$$

$$= \frac{₹30}{₹210} \times 100$$

= 14.3 per cent

1. Calculation of EPS

   Operating Profit = ₹20,00,000 x 0.15 = ₹3,00,000

   No.of Equity Shares = 20,00,000/200 = 10,000 Shares

   EPS = 3,00,000/10,000 = ₹30

2. Net Proceeds (NP) = Face value + Premium – Floatation cost = 200 +20 – 10 = ₹210

Illustration 5: A firm is currently earning ₹ 1,00,000 and its share is selling at a market price of ₹ 90. The firm has 10,000 shares outstanding and has no debt. Compute the cost of equity.

Notes

Solution:

$$K_e = \frac{E}{MP} \times 100$$

$$= \frac{₹10}{90} \times 100 = 11.11$$

Dividend Capitalization plus Growth Rate Approach [(D/MP) + g]/ Dividend Growth Model Approach

Computation of cost of equity capital based on a fixed dividend rate may not be appropriate, because the future dividend may grow. The growth in dividends may be constant perpetually or may vary over a period of time. It is the best method over dividend capitalisation approach, since it considers the growth in dividends. Generally, investors invest in equity shares on the basis of the expected future dividends rather than on current dividends. They expect increase in future dividends. Growth in dividends will have positive impact on share prices.

Cost of Capital under Constant Growth Rate Perpetually

The formula for computation of cost of equity under constant growth rate is:

$$K_e = \frac{D}{NP \text{ or } CMP} + g$$

Where,

K_e = Cost of equity capital.

D = Dividends per share.

NP = Net proceeds per share.

CMP = Current market price per share.

g = Growth rate (%).

Dividend per share is the expected dividend per share and if dividend for the last year is given then the expected dividend will be calculated as:

$$D_1 = D_0 (1+g)$$

Where

D_1 = value of expected divided

D_0 = value of dividend paid for last year

G = growth rate

In the above case if the formula to calculate the cost of equity will be:

$$= D_0 (1+g)/NP \text{ or } CMP + g$$

Illustration 6: Equity shares of a paper manufacturing company is currently selling for ₹ 100. It wants to finance its capital expenditure of ₹ 1 lakh either by retaining earnings or selling new shares. If company seeks to sell shares, the issue price will be ₹ 95. The expected dividend next year is ₹ 4.75 and it is expected to grow at 6 per cent perpetually. Calculate cost of equity capital (internal and external).

Solution:

$$K_e = \frac{D}{MP} + g$$

Notes

$$K_e = \frac{4.75}{100} + 0.06$$

= 0.048 + 0.06

= 10.8 per cent

Calculate cost of external equity (Issue of shares)

$$K_e = \frac{4.75}{95} + 0.06$$

= 0.050 + 0.06

= 11 per cent

Cost of Capital under Variable Growth Rate

The computation cost of equity after a specific period, is based on the estimation of growth rate in dividends of a company. Expected growth rate will be calculated based upon the past trend in dividend. It may not be unreasonable to project the trend into the future, based on the past trend. The financial manager must estimate the internal growth rate in dividends on the basis of long range plans of the company. Expected growth rate in the internal context requires to be adjusted.

Your can estimate by using the following formula:

1. ***Average Annual Growth Rate:*** The following group to explain the calculation by using Average Annual Growth Rate method.

Example:

Year	Div. per share	Rupee charge	Growth
1996	21	----	----
1997	22	1	4.76
1998	23	1	4.55
1999	24	1	4.35
2000	25	1	4.17
2001	26	1	4.00
2002	27	1	3.85
2003	28	1	3.70

If you average the 7 growth rates, the result will be 4.19%. So you can use this as an estimate of the expected growth rate g.

2. ***Return of Growth Rate Method:*** In this method you first forecast the firm's average retention rate and then multiply it by the firm's expected future return on equity (ROE)

$$g = (\text{Retention Rate}) \times (\text{ROE})$$

where

Retention Rate = 1- Div. Payout Rate

Example: If the forecasted retention rate and return on equity are 0.60 and 15% respectively, the growth rate is:

$$g = (0.60)\ (15\%) = 9\ \%$$

Notes

Bond Yield Plus Risk Premium Approach

According to this approach, the rate of return required by the equity shareholder of a company is equal to

$$K_e = \text{yield on long-term bonds} + \text{risk premium}$$

Illustration 7: XYZ Company is planning to sell equity shares. Mr. A is planning to invest in XYZ Company by purchasing equity shares. Bond yield of XYZ Company is 12 per cent. Mr. A, an investor requests you to calculate his required rate of return on equity with 3 per cent risk premium.

Solution:

K_e = Bond yield + risk premium = 10% + 3% = 13 per cent

Realised Yield Approach

Computation of the cost of equity based on dividends capitalisation and earnings capitalisation, have serious limitations. It is not possible to estimate future dividends and earnings correctly, both these variables are uncertain. In order to remove the difficulty in the estimation of the rate of return that investors expect on equities, where future dividends, earnings and market price of share are uncertain, Realised Yield Approach is suggested. It takes into consideration that, the actual average rate of returns realised in the past few years, may be applied to compute the cost of equity share capital i.e, the average rate of returns realised by considering dividends received in the past few years along with the gain realised at the time of sale of share.

This is more logical because the investor expects to receive in future at least what he has received in the past. The realised yield approach is based on the following assumptions:

1. Firms risk does not change over the period.
2. Past realised yield is the base for shareholders expectations.
3. There is no opportunity cost to investors.
4. Market price of equity share does not change significantly.

Caution Calculation of the cost of equity based on realised yield approach is not realistic, due to unrealistic assumptions.

Illustration 8: An investor purchased equity share of HPH company at ₹ 240 on 01.01.1998 and after holding it for 5 years sold the share in early 2003 at ₹ 300. During this period of 5 years, he received a dividend of ₹ 14 in 1998 and 1999 and ₹ 14.5 from 2000 to 2002. Calculate the cost of equity capital based on realised yield approach with 10 per cent discounting factor.

Notes

Solution:

Years	Cash inflows (₹)	DF 10%	PV of Cash inflows (₹)
1998	14.0	0.909	12.7
1999	14.0	0.826	11.6
2000	14.5	0.751	10.9
2001	14.5	0.683	9.9
2002	14.5	0.621	9.0
2003	300.0	0.621	186.3
			240.4
		(-) Purchase price in 1998	240.0
			0.4

At 10 per cent discount rate, the total PV of cash inflows equals to the PV of cash outflows. Hence, cost of equity capital is 10 per cent.

Capital Asset Pricing Model Approach (CAPM)

Capital Asset Pricing Model (CAPM) was developed by William F. Sharpe. This is another approach that can be used to calculate cost of equity. From the cost of capital point of view, CAPM explains the relationship between the required rate of return, or the cost of equity capital and the non-diversifiable or relevant risk, of the firm as reflected in its index of non-diversifiable risk that is beta (β). Symbolically,

$$K_e = R_f + (R_{mf} - R_f)\,\beta$$

Where,

K_e = Cost of equity capital.

R_f = Rate of return required on a risk free security (%).

β = Beta coefficient.

R_{mf} = Required rate of return on the market past folio of assets, that can be viewed as the average rate of return on all assets.

Assumptions

CAPM approach is based on the following assumptions:

1. ***Perfect Capital Market:*** All investors have the same information about securities:
   (a) There are no restrictions on investments (buying and selling)
   (b) Securities are completely divisible
   (c) There are no transaction costs
   (d) There are no taxes
   (e) Competitive market – means no single investor can affect market price significantly
2. ***Investors preferences:*** Investors are risk averse:
   (a) Investors have homogenous expectations regarding the expected returns, variances and correlation of returns among all securities.
   (b) Investors seek to maximise the expected utility of their portfolios over a single period planning horizon.

Notes

Illustration 9: The Capital Ltd., wishes to calculate its cost of equity capital using the Capital Asset Pricing Model (CAPM) approach. Company's analyst found, that its risk free rate of return equals 12 per cent beta equal equals 1.7 and the return on market portfolio equals 14.5 per cent.

Solution:

$$K_e = R_f + (R_{mf} - R_f)\,\beta = 12 + [14.5 - 12]\,1.7$$

$$= 12 + 4.25 = 16.25 \text{ per cent}$$

Task A company's earnings available to ordinary shareholders is ₹ 5,00,000. It has capital ₹ 50,00,000, face value of ₹ 100 each. The company's share is selling at ₹ 200. Compute cost of equity (Assuming 100% dividend payout ratio).

4.3.2 Cost of Preference Shares

The preference share is issued by companies to raise funds from investors.

Did u know? Preference share has two preferential rights over equity shares, (i) preference in payment of dividend, from distributable profits, (ii) preference in the payment of capital at the time of liquidation of the company.

There are different types of preference shares, cumulative and non-cumulative, redeemable and irredeemable, participating and non-participating, and convertible and non-convertible. But computation of cost of preference share will be only for redeemable and irredeemable.

Cost of Irredeemable Preference Share/Perpetual Preference Share

The share that cannot be paid till the liquidation of the company is known as irredeemable preference share. The cost is measured by the following formula:

$$K_p \text{ (without tax)} = \frac{D}{CMP \text{ or } NP}$$

Where,

K_p = Cost of preference share.

D = Dividend per share.

CMP = Market price per share.

NP = Net proceeds.

Cost of irredeemable preference stock (with dividend tax)

$$K_p \text{ (without tax)} = \frac{D(1+Dt)}{CMP \text{ or } NP}$$

Where,

Dt = tax on preference dividend

Illustration 10: HHC Ltd., issues 12 per cent perpetual preference shares of face value of ₹ 200 each. Compute cost of preference share (without tax).

Notes

Solution:

$$K_p = \frac{D}{NP} \times 100$$

$$K_p = \frac{24}{200} \times 100 = 12 \text{ per cent}$$

Illustration 11: (with dividend tax): A company is planning to issue 14 per cent irredeemable preference share at the face value of ₹ 250 per share, with an estimated flotation cost of 5%. What is the cost of preference share with 10% dividend tax.

Solution:

$$K_p = \frac{D(1+Dt)}{NP} \times 100$$

$$= \frac{35(1+0.10)}{237.5} \times 100 = 16.21 \text{ per cent}$$

Illustration 12: Sai Ram & Co. is planning to issue 14 per cent perpetual preference shares, with face value of ₹ 100 each. Floatation costs are estimated at 4 per cent on sales price. Compute (a) cost of preference shares if they are issued at (i) face/par value, (ii) 10 per cent premium, and (iii) 5 per cent discount, (b) compute cost of preference share in these situation assuming 5 per cent dividend.

Solution:

Without dividend tax	With dividend tax
(i) Issued at face value $K_p = \frac{14}{(100-4)} = 14.6$ per cent	(i) Issued at face value $K_p = \frac{14(1+0.05)}{96} = 15.4$ per cent
(ii) Issued at 10% premium $K_p = \frac{14}{(110-4)} = 13.2$ per cent	(ii) Issued at 10% premium $K_p = \frac{14(1+0.05)}{106} = 13.9$ per cent
(iii) Issued at 5% discount $K_p = \frac{14}{(100-5-3.8)} = 15.4$ per cent	(iii) Issued at 5% discount $K_p = \frac{14(1+0.05)}{91.2} = 16.2$ per cent

Cost of Redeemable Preference Shares

Shares that are issued for a specific maturity period or redeemable after a specific period are known as redeemable preference shares. The explicit cost of redeemable preference shares is the discount rate that equates the net proceeds of the sale of preference shares with the present value of the future dividend and principle repayments. In other words, cost of preference share is the discount rate that equates the present value of cash inflows (sale proceeds) with the present value of cash outflows (dividend + principal repayment). Dividends will be paid at the end of each year, but the principle amount will be repaid either in lump sum at the end of maturity period or in installments (equal or unequal). If the principle amount is paid in installments, then the cash outflow for each year equals to dividend plus part of principal amount. Cost of preference shares, when the principal amount is repaid in one lumpsum amount:

$$K_p = \frac{D + (f + d + pr - pi)/N_m}{(RV + NP)/2}$$

Notes

Where,

D = Dividend per share.

f = Flotation cost (₹).

d = Discount on issue of preference share (₹).

p_r = Premium on redemption of preference shares (₹).

p_i = Premium on issue of preference share (₹).

N_m = Term of preference shares.

RV = Redeemable value of preference share.

NP = Net proceeds realized.

Illustration 13 (Lump sum repayment): A company issues ₹ 1,00,000, 10 per cent preference shares of ₹ 100 each redeemable after 10 years at face value. Cost of issue is 10 per cent. Calculate the cost of preference share.

$$K_p = \frac{D + (f + d + pr - pi)/N_m}{(RV + NP)/2}$$

Where,

D = Dividend per share.

f = Flotation cost (₹).

d = Discount on issue of preference share (₹).

p_r = Premium on redemption of preference shares (₹).

p_i = Premium on issue of preference share (₹).

N_m = Term of preference shares.

RV = Redeemable value of preference share.

NP = Net proceeds realized.

$$K_p = \frac{10 + (10 + 0 + 0 - 0)/10}{(100 + 90)/2}$$

$$= \frac{10 + (1)}{95} = 11.579 \text{ per cent}$$

4.3.3 Cost of Debentures/Debt/Public Deposits

Companies may raise debt capital through issue of debentures or loan from financial institutions or deposits from public. All these resources involve a specific rate of interest. The interest paid on these sources of funds is a charge on the profit & loss account of the company. In other words, interest payments made by the firm on debt issue qualify tax deduction in determining net taxable income. Computation of cost of debenture or debt is relatively easy, because the interest rate that is payable on debt is fixed by the agreement between the firm and the creditors. Computation of cost of debenture or debt capital depends on their nature. The debt/debentures can be perpetual or irredeemable and redeemable cost of debt capital is equal to the interest paid on that debt, but from company's point of view it will be less than the interest payable, when the debt is issued at par, since the interest is tax deductible. Hence, computation of debt is always after tax cost.

Notes

Cost of Irredeemable Debt/Perpetual Debt

Perpetual debt provides permanent funds to the firm, because the funds will remain in the firm till liquidation. Computation of cost of perpetual debt is conceptually relatively easy. Cost of perpetual debt is the rate of return that lender expect (i.e., fixed interest rate). The coupon rate or the market yield on debt can be said to represent an approximation of cost of debt. Bonds/ debentures can be issued at (i) par/face value, (ii) discount and (iii) premium. The following formulae are used to compute cost of debentures or debt of bond:

1. ***Pre-tax cost:*** $Kdi = \frac{I}{P \text{ or } NP}$

2. ***Post-tax cost:*** $Kdi = \frac{I(1-t)}{P \text{ or } NP}$

Where,

Kdi = Pre-tax cost of debentures.

I = Interest

P = Principle amount or face value.

P = Net sales proceeds.

t = Tax rate.

Illustration 14: XYZ Company Ltd., decides to float perpetual 12 per cent, debentures of ₹ 100 each. The tax rate is 50 per cent. Calculate cost of debenture (pre and post tax cost).

Solution:

(i) ***Pre-tax cost:*** $Kdi = \frac{Rs.\ 12}{100} = 12$ per cent

(ii) ***Post-tax cost:*** $Kd = \frac{12(1-0.5)}{100} = 6$ per cent

Generally, cost of debenture is equal to the interest rate, when debenture is issued at par and without considering tax. Cost will be less than the interest when we calculate cost after considering tax since it is tax deductible. From the cost of capital point of view, debenture cost is always in post tax cost.

Sometimes debentures may be issued at premium or discount. A company, which is having a good track record, will be issued at premium and a company that is new or unknown to the public or has a nominal or poor track record will be issued at discount. Whenever debentures are issued at premium or discount the cost of debenture will be affected, it will decrease or increase respectively.

Illustration 15: Rama & Co. has 15 per cent irredeemable debentures of ₹ 100 each for ₹ 10,00,000. The tax rate is 35 per cent. Determine debenture assuming it is issued at (i) face value/par value (ii) 10 per cent premium and (iii) 10 per cent discount.

Notes

Solution:

Issued at	Pre-tax	Post-tax
(i) Face value	$\frac{₹15}{100}$ = 15 per cent	$\frac{15(1-0.35)}{100}$ = 9.8 per cent
(ii) 10% premium	$\frac{₹\ 15}{110}$ = 13.7 per cent (100 + 10)	$\frac{15(1-0.35)}{110}$ = 8.9 per cent
(iii) 10% discount	$\frac{₹\ 15}{90}$ = 16.67 per cent (100 – 10)	$\frac{15(1-0.35)}{90}$ = 10.9 per cent

Cost of Redeemable Debentures/Debt

Redeemable debentures that, are having a maturity period or are repayable after a certain given period of time. In other words, these type of debentures that are under legal obligation to repay the principal amount to its holders either at certain agreed intervals during the duration of loan or as a lumpsum amount at the end of its maturity period. These type of debentures are issued by many companies, when they require capital for fulfilling their temporary needs.

Cost of Redeemable Debentures

$$K_p = \frac{I(1-t)+(f+d+pr-pi)/N_m}{(RV+NP)/2}$$

Where,

I = Interest.

t = Tax rate.

f = Flotation cost.

d = Discount.

p_r = Premium on redemption.

p_i = Premium on issue.

RV = Redeemable value.

NP = Net proceed.

N_m = Maturity period of debt.

Illustration 16: BE Company issues ₹ 100 par value of debentures carrying 15 per cent interest. The debentures are repayable after 7 years at face value. The cost of issue is 3 per cent and tax rate is 45 per cent. Calculate the cost of debenture.

$$K_p = \frac{I(1-t)+(f+d+pr-pi)/N_m}{(RV+NP)/2}$$

Notes

Where,

I = Interest.

t = Tax rate.

f = Flotation cost.

d = Discount.

p_r = Premium on redemption.

p_i = Premium on issue.

RV = Redeemable value.

NP = Net proceed.

N_m = Maturity period of debt.

$$K_p = \frac{15(1-0.45)+(3-0+0-0)/7}{(100-97)/2}$$

$$K_p = \frac{8.68}{98.5} = 8.81\%$$

Task Sam's company manufactures specialty chemicals. Its debt equity ratio is 0.8. Its overall costs of capital is 15 per cent and 30 per cent tax rate.

1. If Sam's cost of equity is 20%, what is pre-tax cost of debt?
2. If Sam can use debt at an interest rate of 13%, what is cost of equity?

4.4 Weighted Average Cost of Capital (WACC)

A company has to employ a combination of creditors and fund owners. The composite cost of capital lies between the least and most expensive funds. This approach enables the maximisation of profits and the wealth of the equity shareholders by investing the funds in projects earning in excess of the overall cost of capital.

The composite cost of capital implies an average of the costs of each of the source of funds employed by the firm property, weighted by the proportion they hold in the firm's capital structure.

Note **Steps involved in computation of WACC**

1. Determination of the type of funds to be raised and their individual share in the total capitalisation of the firm.
2. Computation of cost of specific source of funds.
3. Assignment of weight to specific costs.
4. Multiply the cost of each source by the appropriate assigned weights.
5. Dividing the total weighted cost by the total weights to get overall cost of capital.

Notes

Once the company decides the funds that will be raised from different sources, then the computation of specific cost of each component or source is completed after which, the third step in computation of cost of capital is, assignment of weights to specific costs, or specific sources of funds. How to assign weights? Is there any base to assign weights? How many types of weights are there?

Assignment of Weights

The weights to specific funds may be assigned, based on the following:

1. ***Book Values*:** Book value weights are based on the values found on the balance sheet. The weight applicable to a given source of fund is simply the book value of the source of fund divided by the book value of the total funds.
2. ***Capital Structure Weights:*** Under this method, weights are assigned to the components of capital structure based on the targeted capital structure. Depending up on the target, capital structures have some difficulties. They are:
   (a) A company may not have a well defined target capital structure.
   (b) It may be difficult to precisely estimate the components of capital costs, if the target capital is different from present capital structure.
3. ***Market Value Weights*:** Under this method, assigned weights to a particular component of capital structure is equal to the market value of the component of capital divided by the market value of all components of capital and capital employed by the firm.

Illustration 17: A firm has the following capital structure as the latest statement shows:

Source of funds	₹	After tax Cost %
Debt	30,00,000	4
Preference shares	10,00,000	8.5
Equity share	20,00,000	11.5
Retained earnings	40,00,000	10
Total	**100,00,000**	

Based on the book values compute the cost of capital.

Solution:

Source of Finance	Weights	Specific Cost (%)	Weighted Cost
Debt	0.30	0.04	0.012
Preference shares	0.10	0.08	0.008
Equity share	0.20	0.11	0.022
Retained earnings	0.40	0.10	0.040
	1.00		0.082

Overall cost of capital (Ko) = Total Weighted Cost x 100

= 0.082 X 100 = 8.2 per cent

Cost of weight

$$\text{Debt weight} = \frac{\text{Debt capital}}{\text{Total capital}} = \frac{30,00,000}{1,00,00,000} = 0.30$$

Notes

Illustration 18: XYZ company supplied the following information and requested you to compute the cost of capital based on book values and market values.

Source of Finance	Book Value (₹)	Market Value (₹)	After Tax Cost (%)
Equity capital	10,00,000	15,00,000	12
Long term debt	8,00,000	7,50,000	7
Short term debt	2,00,000	2,00,000	4
Total	20,00,000	24,50,000	

Solution:

Computation of cost of capital based on book value

Source of Finance	Book Value (₹)	Weights	Specific cost	Weighted cost
(1)	(2)	(3)	(4)	(5) = (3) X (4)
Equity capital	10,00,000	0.50	0.12	0.060
Long term debt	8,00,000	0.40	0.07	0.028
Short term debt	2,00,000	0.10	0.04	0.004
Total	20,00,000	1.00		0.092

Cost of capital = 0.092 x 100 = 9.2 per cent

Cost of capital based on market value weight

Source of Finance	Book Value (₹)	Weights	Specific cost	Weighted cost
(1)	(2)	(3)	(4)	(5) = (3) X (4)
Equity capital	15,00,000	0.613	0.12	0.074
Long term debt	7,50,000	0.307	0.07	0.022
Short term debt	2,00,000	0.080	0.04	0.003
	24,50,000	1.000		0.099

Cost of capital = 100 X 0.099 = 9.9 per cent

Weighted average cost of capital (alternative method)

Source of Finance	Market Value (₹)	Cost (%)	Total Cost
(1)	(2)	(3)	(4) = (2) X (3)
Equity capital	15,00,000	0.12	1,80,000
Long term debt	7,50,000	0.07	52,500
Short term debt	2,00,000	0.04	8,000
	24,50,000		2,40,500

Case Study

Nike, Inc. – Cost of Capital

On July, Kimi-ford, a portfolio manager at North Point Group, a mutual-fund-management firm, pored over analysts' write-ups of Nike, Inc., the athletic-shoe manufacturer. Nike's share price had declined significantly from the start of the year. Ford was considering buying some shares for the fund she managed, the North Point Large-Cap Fund, which invested mostly in fortune 500 companies, with an emphasis on value investing. Its top holdings included Exxon Mobile. General Motors, McDonald's, 3M, and other large-cap. It had performed extremely well. In 2000, the fund earned a return of

Contd...

Notes

20.7 per cent even as the S&P 500 fell 10.1 per cent. The fund's year-to-date returns at the end of June 2001 stood at 6.4 versus the S &P – 7.3 per cent.

Only a week ago, on June 28,2001, Nike held an analyst' meeting to disclose its fiscal-year 2001 results. The meeting, however had another purpose : Nike management wanted to communicate a strategy for revitalizing the company. Since 1997 Nike's revenues had plateaued at around $9 billion, while net income had fallen from almost $ 800 million to $580 million (see Exhibit 1). Nike's markets in the U.S. had fallen from 48 per cent in 1997 to 42 per cent in 2000. In addition, recent supply-chain issues and the adverse effect of a strong dollar had negatively affected revenue.

At the meeting, the management revealed plans to address both-line growth and operating performance. To boost revenue, the company would develop more athletic-shoe products in the mid-priced segment – a segment that had been overlooked in the recent years. Nike also planned to push its apparel line, which, under the recent leadership of industry veteran Mindy Grossman had performed extremely well. On the cost side, Nike would exert more effort on expense control, finally, the company's executives reiterated their long-term revenue growth targets of 8-10 per cent and earnings-growth targets of above 1 percent.

The Analysts reactions were mixed. Some thought, the financial targets too aggressive ; other saw significant growth opportunities in apparel and in Nike's international businesses.

Ford read all the analysts reports that she could find about the June 28 meeting, but the reports gave her no clear guidance : a Lehman Brothers report recommended a "Strong Buy", while UBS analysts expressed misgiving about the company and recommended a "Hold". Ford decided instead to develop her own discounted-cash-flow forecast to come to a clearer conclusion.

Her forecast showed that, at discount rate of 12 per cent, Nike was overvalued at its current share price of $42.09 (see Exhibit 2). She had, however, done a quick sensitivity analysis that revealed Nike was valued at discount rates below 11.2 per cent. As she was about to go into a meeting, she asked her new assistant, Joanna Cohen, to estimate Nike's cost of capital.

Cohen immediately gathered all the data she though she might need (Exhibits 1,2,3 and 4) began to work on her analysis. At the end of the day, she submitted her cost-of-capital estimate and a memo (Exhibit 5) explaining her assumption to Ford.

Exhibit 1: Consolidated Income Statements
Year ended May 31

(in millions excepts per share data)

	2000	2001	2002	2003	2004	2005	2006
Revenues	4,760.8	6,470.6	9,816.5	9,553.1	8,776.9	8,995.1	9,488.8
Cost of goods sold	2,865.3	3,906.7	5,503.0	6,065.5	5,493.5	5,403.8	7,784.9
Gross profit	1,895.6	2,563.9	3,683.5	3,487.6	3,283.4	3,591.3	3,703.9
Selling and administrative	1,209.8	1,588.6	2,303.7	2,623.8	2,426.6	2,606.4	2,689.7
Operating Income	685.8	975.3	1,379.8	863.8	856.8	984.9	1,014.2
Interst expense	24.2	39.5	52.3	60.0	44.1	45.0	58.7
Other expense net	11.7	36.7	32.3	20.9	21.5	23.2	34.1
Restructuring charge, net	---	---	---	129.9	45.1	2.5	---
Income before Income taxes	649.9	899.1	1,295.20	653.0	746.1	919.2	921.4
Income taxes	250.2	345.9	499.4	253.4	294.7	340.1	331.7
Net Income	399.7	553.2	795.8	399.6	451.4	579.4	589.7

Contd...

Notes

Diluted earning per Annum Shares	1.4	1.9	2.7	1.4	1.6	2.1	2.2
Average shares outstanding (diluted)	294.0	293.6	297.0	296.0	287.5	279.8	273.3
Growth(%)							
Revenue		35.9	42.0	4.0	8.1	2.5	5.5
Operating income		42.2	41.5	37.4	0.8	15.0	3.0
Net income		38.4	43.9	49.8	13.0	28.3	1.8
Margins (%)							
Gross margin		39.6	40.1	36.5	37.4	39.9	39.0
Operating margin		15.1	15.0	9.0	9.8	10.9	10.7
Net margin		8.5	8.7	4.2	3.1	6.4	6.2
Effective tax rate (%)		38.5	38.6	38.8	39.5	37.0	36.0

Exhibit 2: Discounted - Cash - flow Analysis

	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016
Assumption										
Revenue growth (%)	7.0	6.5	6.5	6.5	6.0	6.0	6.0	6.0	6.0	6.0
COGS/Sales (%)	60.0	60.0	59.5	59.5	59.0	59.0	58.5	58.5	58.0	58.0
S & A/Sales (%)	28.0	27.5	27.0	26.5	26.0	25.5	25.0	25.0	25.0	25.0
Tax rate (%)	38.0	38.0	38.0	38.0	38.0	38.0	38.0	38.0	38.0	38.0
Current Assets/ sales (%)	38.0	38.0	38.0	38.0	38.0	38.0	38.0	38.0	38.0	38.0
Current liabilities/ sales (%)	11.5	11.5	11.5	11.5	11.5	11.5	11.5	11.5	11.5	11.5
Yearly deprecia-tions Equals capex.										
Cost of Capital (%)	12.0									
Terminal growth rate (%)	3.0									
Discounted cash flow										
Opeating income	1,218.4	1,351.6	1554.6	1717.0	1950.0	2135.9	2410.2	2554.8	2790.1	2957.5
Taxes	463.0	513.6	590.8	652.5	741.0	811.7	915.9	970.8	1060.2	1123.9
NOPAT	755.4	838.0	963.9	1064.5	1209.0	1324.3	1494.3	1584.0	1729.9	1833.7
Capex.net of derecia-tion	---	---	---	---	---	---	---	---	---	---
Change in NWC	8.8	-174.9	186.3	198.4	195.0	206.7	219.1	232.3	246.2	261.0
Free cash flow	764.1	663.1	776.6	866.2	1014.0	1176.6	1275.2	1351.7	1483.7	1572.7
Terminal value										17998.7
Total flows	764.1	663.1	776.6	866.2	1014.0	1176.6	1275.2	1351.7	1483.7	19571.5
Present value of flows	682.3	528.6	553.5	550.5	575.4	566.2	576.8	545.9	535.0	6301.5
Enterprise value	11415.7									
Less : current out-standing dept.	1296.6									
Equity value	10119.1									
Current shares outstanding	271.5									
Equity value per share	$37.27		Current share price		$42.09					

Contd...

Notes

Exhibit 3: Sensitivity of equity value of discount rate

Discount rate	Equity value
8.00%	$75.80
8.50	67.85
9.00	61.25
9.50	55.68
10.00	50.92
10.50	46.81
11.00	43.22
11.17	42.09
11.50	40.07
12.00	37.27

Exhibit 4: Consolidated Balance Sheets (in millions) May 31

	2005	2006
Assets		
Current assets		
Cash and equivalents	$254.3	$304.0
Accounts receivable	1,569.4	1,621.4
Inventories	1,446.0	1,424.0
Deferred income taxes	111.5	113.3
Prepaid expenses	215.2	162.5
Total Current assets	3,596.4	3,625.3
Property, plant and equipment, net	1,583.4	1,618.8
Identifiable, intangible assets and goodwill, net	410.9	397.3
Deferred income taxes and other assets	266.2	178.2
Total assets	**$5,856.9**	**$5,819.6**
Liabilities and shareholder's equity		
Current liabilities		
Current portion of long-term debt	$50.1	$5.4
Notes payable	924.2	855.3
Accounts payable	543.8	432
Accrued liabilities	621.9	472.1
Income taxes payable	-----	21.9
Total current liabilities	2,140.0	1,786.7
Long-term debt	470.3	435.9
Deferred income taxes and other liabilities	110.3	102.2
Redeemable preferred stock	0.3	0.3
Share holder equity		
Common stock, par	2.8	2.8
Capital in excess of stated value	369.0	459.4
Unearned stock comper	11.7	9.9
Accumulated other comprehensive income	111.1	152.1
Retained earnings	2887.0	3194.3
Total share holder equity	3136.0	3494.5
Total liabilities and shareholder's equity	**$5,856.9**	**$5,819.6**

Notes

Exhibit 5: Dr. Bhatt's Analysis

Subject: Nike's Cost of Capital

Based on the following assumptions, my estimate of Nike's cost of capital is 8.4 percent :

Single or Multiple Costs of Capital

The first question I considered was whether to use single or multiple costs of capital given that Nike has multiple business segments. Aside from footwear, which makes up 62 per cent of revenue. Nike also sells apparel (30 per cent of revenue) that complement its footwear products. In addition, Nike sells sport balls, time-pieces, eyewear, skates, bats and other equipment designed for sports activities. Equipment products account for 3.6 per cent of revenue. Finally, Nike also sells some non- Nike branded products such as Cole-Haan dress and casual footwear, and ice stakes, skate blades, hockey sticks, hockey jerseys and other products under the Bauer trademark, non-Nike brands account for 4.5 per cent of the revenue.

I asked myself, whether Nike's different business segments shad enough risks from each other to warrant different costs of capital. Were their profiles really different? I concluded that it was only the Cole-Haan line that was somewhat different : the rest were all sports-related businesses. However, since Cole-Haan makes up only a tiny fraction of the revenues, I did not think it necessary to compute a separate cost of capital. As for the apparel and footwear lines, they are sold through the same marketing and distribution channels and are often marketed in "collections" of similar design. I believe, they face the same risk factors, as such, I decided to compute only one cost of capital of the whole company.

Methodology for Calculating the Cost of Capital; WACC

Since Nike is funded with both debt and equity, I used the Weighted Average Cost of Capital (WACC) method. Based on the latest available balance sheet, debt as a proportion of total capital makes up 27.0 per cent and equity accounts for 73.0 per cent:

Capital sources	Book Values	
Debt		
Current portion of long-term debt	$ 5.4	
Notes payable	855.3	
Long-term debt	435.9	
	$ 1.291.2	→ 27.0% of total capital
	$ 3.494.5	→ 72.0% of total capital

Cost of Debt

My estimate of Nike's cost of debt is 4.3 per cent. I arrived at this estimate by taking total interest expense for the year 2001 and dividing it by the company's average debt balance. The rare is lower than Treasury yields but that is because Nike raised a portion of its funding needs through Japanese yen notes, which carry rates between 2.0 per cent to 4.3 per cent.

After adjusting for tax, the cost of debt comes to 2.7 per cent. I used a tax rate of 38 per cent, which I obtained by adding state taxes of 3 per cent to the U.S. statutory tax rate. Historically, Nike's state taxes have ranged from 2.5 per cent to 3.5 per cent.

Contd...

Notes

Cost of Equity

I estimated the cost of equity, using the Capital Asset Pricing Model (CAPM). Other methods such as the Dividend Discount Model (DDM) and the Earnings capitalization Ratio can be used to estimate the cost of equity. However, in my opinion, the CAPM is the superior method.

My estimate of Nike's cost of equity is 10.5 per cent I used the current yield on 20-year Treasury bonds as my risk-free rate, and the compound average premium of the market over Treasury bonds (5.9 per cent) as my risk premium. For beta, I took the average of Nike's beta from 1996 to the present.

Putting it all Together

After inputting all my assumptions into the WACC formula, my estimate of Nike's cost of capital is 8.4 per cent.

WACC $= K_d (1 - t) * D/(D + E) + K_c * E/(D + E)$

$= 2.7\% * 27.0\% + 20.5\% * 73.0\%$

$= 8.4\%$

4.5 Summary

- The cost of capital is viewed as one of the corner stones in the theory of financial management.
- Cost of capital is the weight average cost of various sources of finance used by the firm. It comprises the risk less cost of the particular type of financing (r_j), the business risk premium, (b) and the financial risk premium (f). Symbolically $(K_O) = r_j + b + f$.
- The cost of capital is useful in designing optimal capital structure, investment evaluation, and financial performance appraisal.
- The financial manager has to compute the specific cost of each type of funds needed in the capitalisation of a company. Company may resort to different financial sources (equity share, preference share, debentures, retained earning, public deposits.
- Retained earnings are one of the internal sources to raise equity finance. Corporate executives and some analysts too normally consider the retained earnings as cost free, but it is not so. They involve opportunity.
- Cost of equity capital, is the minimum rate of return that a firm must earn on the equity financed portions of an investment project in order to leave unchanged the market price of the shares. There are six approaches available to compute K_e.
- Cost of preference share capital (K_p) is a function of the dividend expected by the investors. K_p is having some conceptual difficulty. There are different types of preference shares. But computation of K_p is only done for the redeemable and irredeemable shares.
- Computation of Cost of capital/of WACC involves five steps: (1) Determination of the type of funds to be raised and their individual share in the total capitalisation of the firm, (2) Computation of the cost of each type of funds, (3) Assigning weights to specific costs, (4) Multiplying the cost of the source by the (appropriate) assigned weights, and (5) Dividing the total weighted cost by the total weights to get over all cost of capital.

Notes

4.6 Keywords

Cost of Capital: It is that minimum rate of return, which a firm must earn on its investments so as to maintain the market value of its shares.

Explicit Cost: It is the discount rate that equates the present value of the cash inflows with the present value of its increments cash outflows.

Future Cost: It is the cost of capital that is expected to raise the funds to finance a capital budget or investment proposal.

Implicit Cost: It is the cost of opportunity which is given up in order to pursue a particular action.

Marginal Cost of Capital: The additional cost incurred to obtain additional funds required by a firm.

Opportunity Cost: The benefit that the shareholder foregoes by not putting his/her funds elsewhere because they have been retained by the management.

Specific Cost: It is the cost associated with particular component or source of capital.

Spot Cost: The cost that are prevailing in the market at a certain time.

4.7 Self Assessment

Fill in the blanks:

1. Cost of capital is the ..... required rate of return expected by investors.
2. Cost of capital, is the measurement sacrifice made by ..... with regard to capital formation.
3. According to ..... cost of capital is the minimum required rate of earnings or the cut off rate of capital expenditure.
4. Cost of Capital (K_o) = r_f + ... +f.
5. The explicit cost is the ....., which equates the present value of cash inflows with present value of cash outflows.
6. An average of the cost of each source of funds employed by the firm for capital formation is known as ..... .
7. Cost of capital is not useful in capital budgeting if a firm is depended on ..... methods.
8. ..... is the additional cost incurred to obtain additional funds required by a firm.
9. Bond yield plus ..... is one of the approaches available to calculate cost of equity capital.
10. ..... is the cost associated with particular component at capital structure.

State whether the following statements are true or false:

11. Cost of capital comprises three components.
12. Cost of capital with minimum required rate of return needs to be justified.
13. There is no cost for internally generated funds.

Notes

14. According to traditional approach, cost of capital is affected by debt equity MPC.
15. Cost of capital is useful in capital budgeting, in evaluation based on discounted cash flow techniques only.
16. CAPM approach is one of the approaches used in computation of cost of equity capital.
17. In Bond yield plus risk premium approach of cost of equity, risk premium ranges between 2% to 6%.

4.8 Review Questions

1. What is the relevance of cost of capital in capital budgeting decisions?
2. Write a note on CAPM approach for calculation of cost of equity.
3. State any four methods of computing cost of equity.
4. The basic formula to calculate the cost of equity is D/P + g. Explain its rationale.
5. How is cost of debt calculated?
6. How is cost of preference share calculated?
7. Discuss the following bases for determining the weights in cost of capital calculation, book values, target capital structure and market values.
8. How should you handle the flotation costs in the determination of cost of capital?
9. What are the steps involved in calculating a firm's WACC?
10. What is cost of equity? Write a detailed note on the approaches available for computation of cost of equity.
11. Define cost of capital. Discuss in detail the steps involved in computation of WACC.
12. "Evaluating capital budgeting proposals without cost of capital is not possible". Discuss.
13. Critically evaluate the different approaches to the calculation of cost of equity capital.

Answers: Self Assessment

1.	Minimum	2.	Investor
3.	Soloman Izra	4.	'b' business risk premium
5.	discount rate	6.	Overall cost of capital
7.	Traditional approach	8.	Marginal cost
9.	Risk premium	10.	Specific cost
11.	True	12.	True
13.	False	14.	True
15.	True	16.	True
17.	True		

4.9 Further Readings

Notes

Books

Chandra, P., *Financial Management - Theory and Practice*, New Delhi, Tata McGraw Hill Publishing Company Ltd., 2002, p. 3.

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Van Horne, J.C. and Wachowicz, Jr, J.M., *Fundamentals of Financial Management*, New Delhi, Prentice Hall of India Pvt. Ltd., 1996, p. 2.

Online link

http://www.fei.org/

Notes

Unit 5: Capital Structure Decisions

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Objectives

After studying this unit, you will be able to:

- Discuss concept of capital structure
- Know about debt and equity
- Describe Leverage

Introduction

Every organisation requires funds to run and maintain its business. The required funds may be raised from short-term sources or long-term sources or a combination both the sources of funds, so as to equip itself with an appropriate combination of fixed assets and current assets. Current assets to a considerable extent are financed with the help of short-term sources. Normally, firms are expected to follow a prudent financial policy, as revealed in the maintenance of net current assets. This net positive current asset must be financed by long-term sources. Hence, long-term sources of funds are required to finance for both (a) long-term assets (fixed assets) and (b) networking capital (positive current assets). The long-term financial strength as well as profitability of a firm is influenced by its financial structure.

Did u know? The term 'Financial Structure' refers to the left hand side of the balance sheet as represented by "total liabilities" consisting of current liabilities, long-term debt, preference share and equity share capital. The financial structure, therefore, includes both short-term and long-term sources of funds.

Notes

5.1 Meaning of Capital Structure

Capital structure is that part of financial structure, which represents long-term sources. The term capital structure is generally defined to include only long-term debt and total stockholder investment. The term capital structure refers to the mix of long-term sources of funds, such as equity shares capital, reserves and surpluses, debenture, long-term debt from outside sources and preference share capital. To quote Bogen, "Capital structure may consist of a single class of stock, or it may be complicated by several issues of bonds and preferred stock, the characteristics of which may vary considerably". In other words, capital structure refers to the composition of capitalisation, i.e., to the proportion between debt and equity that make up capitalisation.

Note Capital Structure = Long-term Debt + Preferred Stock + Net worth

or

Capital Structure = Total Assets – Current Liabilities

Thus, the capital structure of a firm consists of the shareholder' funds and debt. The inherent financial stability of an enterprise and risk of insolvency to which it is exposed, are primarily dependent on the source of its funds as well as the type of assets it holds and relative magnitude of such asset categories.

5.2 Forms of Capital Structure

While making or farming the capital structure, a firm may use equity share capital or preference share capital or debt capital (debentures or loans) or a combination of them all. However, the use of any one of the above sources does not help to come up with an optimum capital structure. Optimum capital structure is possible only when there is a mix of all the above sources (debt and equity). The following are the forms of capital structure.

1. Complete equity share capital;
2. Different proportions of equity and preference share capital;
3. Different proportions of equity and debenture (debt) capital and
4. Different proportions of equity, preference and debenture (debt) capital.

5.3 Factors Determining the Capital Structure

The given below are the key factors which affect the capital structure decision:

1. ***Retaining Control:*** The capital structure of a company is also affected by the extent to which the existing management of the company desires to maintain control over the affairs of the company. If the company issues debt capital or preference capital, there is no risk of dilutions of control. The company can also buy back the shares to increase the control of the promoters over the company.
2. ***Nature of the Enterprise:*** Business firms with stable earnings or monopoly firms supplying basic necessaries can have more or debt capital because they have the capacity to service the debt. The firms without the above advantages should rely more on equity.
3. ***Purposes of Financing:*** If the purpose is productive, the firm may use the debt capital otherwise it is better to rely more on equity capital.

Notes

4. ***Period of Finance:*** If the finance is required for a very long time, equity shares should be issued because it is a permanent source. If the funds are required only for a short period, short term debt may be raised.

5. ***Requirement of Investors:*** The Company requiring large amount of capital must issue different kinds of securities to suit the requirements of different investors.

Example: Regular income bonds, deep discount bonds, partly convertible bonds, equity shares, preference shares etc.

6. ***Size of the Company:*** Small companies and companies with low credit ratings must rely more on equity capital market as it is very easy to issue equity capital. On the other hand, large companies with good credit ratings can raise debt capital easily.

7. ***Market Sentiments:*** This is another factor influencing the capital structure decision. When there is a boom in the capital market it is very easy to issue equity capital. But when in the market bear conditions prevail, people will look for safety. So only debt instruments with good credit rating can be issued during such periods.

8. ***Cash Flow Ability:*** The issue of debt depends on the future cash flow ability of the company.

9. ***Floating Costs:*** Floatation costs are incurred when the funds are raised externally. So retained earnings do not involve floatation costs. Floatation costs for the issue of share is more than that of debentures and bonds. Further the floatation costs are much less when the company issues securities on private placement basis instead of public issue.

5.4 Concept of Leverage

As we have seen in the above discussion, that a firm can raise its required finance either equity or debt or both the sources. While constructing capital structure, a firm can use fixed cost bearing securities for maximisation of shareholder ' wealth. Leverage has been defined as, the action of a lever and mathematical advantage gained by it. In other words, leverage allows accomplishing certain things that are otherwise not possible. The concept is valid in business also. From the financial management point of view, the term leverage is commonly used to describe the firm's ability to use fixed cost assets or sources of funds to magnify the returns to its owners.

There are two types of leverages, such as:

1. Operating leverage
2. Financial leverage

5.4.1 Operating Leverage

Operating leverage may be defined as the firm's ability to use operating costs to magnify the effects of changes in sales on its earnings before interest and taxes. Operating leverage is associated with investment (assets acquisition) activities. Hence, operating leverage results from the present fixed operating expenses with in firm's income stream. The operating costs are categorised into three:

1. ***First:*** Fixed costs, which do not vary with the level of production, they must be paid regardless of the amount of revenue available.

Example: Depreciation plant and machinery, buildings, insurance, etc.

Notes

2. ***Second:*** Variable costs that varies directly with the level of production.

Example: Raw materials, direct labour costs, etc.

3. ***Third:*** Semi-variable costs, which partly vary and is partly fixed.

The degree of operating leverage may be defined as the change in the percentage of operating income (EBIT), for the change in percentage of sales revenue. The degree of operating leverage at any level of output is arrived at by dividing the percentage change in EBIT with percentage change in sales.

That is

$$\text{Degree of Operating Leverage} = \frac{\text{Percentage change in EBIT}}{\text{Percentage change in sales}}$$

or

$$= \frac{\text{Contribution}}{\text{Operating Profit (EBIT)}}$$

Caution Operating leverage may be favourable or unfavourable. High degree of operating leverage indicates high degree of risk.

Notes

Computation of Earnings available to Equity Shareholders

Particulars	Amount (₹)
Sales Revenue (units sold x selling price pu)	X X X X
Less : Variable cost	X X X
[Units produced x cost per unit]	
Contribution	X X X X
Less: Fixed cost	X X X
Earnings Before Interest & Taxes (EBIT)	X X X X
Less: Interest	X X X
Earnings Before Tax (EBT)	X X X X
Less: Tax	X X X
Earnings After Taxes (EAT)	X X X X
Less: Preference Dividend	X X X
Earnings available to Equity shareholder (EAES)	X X X X

Illustration 1: XYZ Ltd., produced and sold 1,00,000 units of a product at the rate of ₹100. For production of 1,00,000 units, it has spend a variable cost of ₹ 6,00,000 at the rate of ₹ 6 per unit and a fixed cost of ₹ 2,50,000. The firm has paid interest ₹ 50,000 at the rate of 5 per cent and ₹ 1,00,000 debt. Calculate operating leverage.

Solution:

Particulars	Amount ₹
Sales Revenue (1,00,000 x ₹ 100)	10,00,000
Less: Variable cost (1,00,000 x ₹ 6)	6,00,000
Contribution	4,00,000
Less: Fixed cost	2,50,000
EBIT	1,50,000

Notes

$$\text{DOL} = \frac{\text{Contribution}}{\text{EBIT or Operating profit (EBIT)}}$$

$$\text{Operating leverage} = \frac{4,00,000}{1,50,000} = 2.66$$

5.4.2 Financial Leverage

A firm may need long-term funds for long-term activities like expansion, diversification, modernization etc., the financial managers job is to compose funds. The required funds may be raised by two sources: equity and debt. Use of various sources to compose capital is known as financial structure. The use of fixed charges, sources of funds such as debt and preference share capital along with the equity share capital in capital structure is described as financial leverage.

Financial leverage results from the presence of fixed financial charges in the income statement. Financial leverage associates with financing activities. The fixed charges do not vary with firm's EBIT. They must be paid regardless of the amount of EBIT available to the firm. It indicates the effect on EBIT created by the use of fixed charge securities in the capital structure of a firm.

Financial leverage is computed by the following formula:

$$\text{Financial (Leverage)} = \frac{\text{EBIT or operating profit}}{\text{EBT or taxable income}}$$

or

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

Caution A Financial leverage may be positive or negative. Favourable leverage occurs when the firm earns more on the assets purchased with the funds, than the fixed cost of their use and vice versa. High degree of financial leverage leads to high financial risk.

Illustration 2: A firm has sales of 1,00,000 units at ₹ 10 pu. Variable cost of the produced products is 60 per cent of the total sales revenue. Fixed cost is ₹ 2,00,000. The firm has used a debt of ₹ 5,00,000 at 20 per cent interest. Calculate the operating leverage and financial leverage.

Solution:

Calculation of EBT

Particulars	**Amount ₹**
Sales Revenue (1,00,000 units x ₹ 10 P.u)	10,00,000
Less: Variable cost (10,00,000 x 0.60)	6,00,000
Contribution	4,00,000
Less: Fixed cost	2,00,000
EBIT	2,00,000
Less: Interest (5,00,000 x 20 /100)	1,00,000
Earning before tax (EBT)	1,00,000

Operating leverage = Contribution ÷ EBIT = 4,00,000 ÷ 2,00,000 = 2

Financial leverage = 2,00,000 ÷ 1,00,000 = 2

Illustration 3: From the following particulars of PQR Company, calculate operating and financial leverages. The company's current sales revenue is ₹ 15,00,000 lakh and sales are expected to increase by 25 per cent. ₹ 9,00,000 incurred on variable expenses for generating ₹15 lakh sales revenue. The fixed cost is ₹ 2,50,000. The company has ₹ 20 lakh equity shares capital and ₹ 20

lakh, 10 per cent debt capital. Calculate operating leverage and financial leverage. ₹ 10 equity and 50 per cent tax rate.

Notes

Solution:

Calculation of EPS

Particulars	Current position	Expected change	Percentage of change
Sales Revenue	15,00,000	18,75,000	25
Less: Variable cost	9,00,000	11,25,000(1)	
Contribution	6,00,000	7,50,000	
Less: Fixed cost	2,50,000	2,50,000	
EBIT	3,50,000	5,00,000	42.86
Less: Interest	2,00,000	2,00,000	
EBT	1,50,000	3,00,000	
Less: Tax 50%	75,000	1,50,000	
EAT	75,000	1,50,000	
Less: Preference dividend	---	---	
Earnings available to shareholder	75,000	1,50,000	
EPS	0.375	0.75	100%

Working Notes

1. ***Variable cost in percentage of Sales:***

$$VC\% = \frac{\text{Total variable cost}}{\text{Sales}} \quad 100 = \frac{9,00,000}{15,00,000} \quad 100 = 60 \text{ per cent}$$

Increase in variable cost = 3,75,000 x 60/100 = 2,25,000

Total variable cost = 9,00,000 + 2,25,000 = ₹ 11,25,000

2. ***Percentage change in EBIT:***

$$\frac{\text{Increase or decrease in EBIT}}{\text{Base EBIT}} \quad 100 = \frac{1,50,000}{3,50,000} \quad 100 = 42.86 \text{ percent}$$

3. ***Interest on Debt:***

$$20,00,000 \quad \frac{20}{100} = ₹4,00,000$$

4. ***EPS***

$$EPS = \frac{\text{Earnings available to shareholders}}{\text{No. of ordinary shares}}$$

Current position = 75000 ÷ 2,00,000 = 0.375

Expected change = 1,50,000 ÷ 2,00,000 = 0.75

(a) Operating Leverage = $\frac{\text{Contribution}}{\text{EBIT}}$ or $\frac{\text{\% change in EBIT}}{\text{\% change in Sales}}$

$$= \frac{6,00,000}{3,50,000} \text{ or } \frac{42.86}{25} = 1.714$$

Notes

(b) Financial leverage $= \frac{\text{EBIT}}{\text{EBT}}$ or $\frac{\text{\% change in EPS}}{\text{\% change in Sales}}$

$= \frac{3,50,000}{1,50,000}$ or $\frac{100}{42.86} = 2.333$

Task A firm has ₹ 40,00,000 lakh sales, variable cost is 70 per cent of sales, and fixed cost is ₹ 8 lakh and debt of ₹ 20 lakh at 10 per cent. Calculate operating and financial leverages.

Case Study

Rajart and Associates: Financial Alternatives

This case provides the opportunity to match financing alternatives with the needs of different companies. It allows the reader to demonstrate a familiarity with different types of securities.

George Thomas was finishing some weekend reports on a Friday afternoon in the downtown office of Wishart and Associates, an investment-banking firm. Meenda, a partner in the firm, had not been in the New York office since Monday. He was on a trip through Pennsylvania, visiting five potential clients, who were considering the flotation of securities with the assistance of Wishart and Associates. Meenda had called the office on Wednesday and told George's secretary that he would cable his recommendations on Friday afternoon. George was waiting for the cable.

George knew that Meenda would be recommending different types of securities for each of the five clients to meet their individual needs. He also knew Meenda wanted him to call each of the clients to consider the recommendations over the weekend. George was prepared to make these calls as soon as the cable arrived. At 4:00 p.m. a secretary handed George the following telegramc

George Thomas, Wishart and Associates STOP Taking advantage of offer to go skiing in Poconos STOP Recommendations as follows: (1) common stock, (2) preferred stock, (3) debt with warrants, (4) convertible bonds, (5) callable debentures STOP. See you Wednesday STOP Meenda.

As George picked up the phone to make the first call, he suddenly realized that the potential clients were not matched with the investment alternatives. In Meenda's office, George found folders on each of the five firms seeking financing. In the front of each folder were some handwritten notes that Meenda had made on Monday before he left. George read each of the notes in turn.

APT, Inc, needs $8 million now and $4 million in four years. Packaging firm with high growth rate in tri-state area. Common stock trades over the counter. Stock is depressed but should rise in year to 18 months. Willing to accept any type of security. Good management. Expects moderate growth. New machinery should increase profits substantially. Recently retired $7 million in debt. Has virtually no debt remaining except short-term obligations.

Sandford Enterprises

Needs $16 million. Crusty management. Stock price depressed but expected to improve. Excellent growth and profits forecast in the next two year. Low debt-equity ratio, as the

Contd....

Notes

firm has record of retiring debt prior to maturity. Retains bulk of earnings and pays low dividends. Management not interested in surrendering voting control to outsiders. Money to be used to finance machinery for plumbing supplies.

Sharma Brothers., Inc.

Needs $20 million to expand cabinet and woodworking business. Started as family business but now has 1200 employees, $50 million in sales, and is traded over the counter. Seeks additional shareholder but not willing to stock at discount. Cannot raise more than $12 million with straight debt. Fair management. Good growth prospects. Very good earnings. Should spark investor's interest. Banks could be willing to lend money for long-term needs.

Sacheetee Energy Systems

The firm is well respected by liberal investing community near Boston area. Sound growth company. Stock selling for $16 per share. Management would like to sell common stock at $21 or more willing to use debt to raise $ 28 million, but this is second choice. Financing gimmicks and chance to turn quick profit on investment would appeal to those likely to invest in this company.

Ranbaxy Industry

Needs $25 million. Manufactures boat canvas covers and needs funds to expand operations. Needs long-term money. Closely held ownership reluctant surrender control. Cannot issue debt without permission of bondholders and First National Bank of Philadelphia. Relatively low debt-equity ratio. Relatively high profits. Good prospects for growth. Strong management with minor weaknesses in sales and promotion areas.

As George was looking over the folders, Meenda's secretary entered the office. George said, "Did Meenda leave any other material here on Monday except for these notes?".

She responded, "No, that's it, but I think those notes should be useful. Meenda called early this morning and said that he verified the facts in the folders. He also said that he learned nothing new on the trip and he sort of indicated that, he had wasted his week, except of course, that he was invited to go skiing at the company lodge up there".

George pondered over the situation. He could always wait until next week, when he could be sure that he had the right recommendations and some of the considerations that outlined each client's needs and situation. If he could determine which firm matched each recommendation, he could still call the firms by 6:00 P.M. and meet the original deadline. George decided to return to his office and match each firm with the appropriate financing.

Questions

1. Which type of financing is appropriate to each firm?
2. What types of securities must be issued by a firm which is on the growing stage in order to meet the financial requirements?

5.5 Summary

- Organisation requires funds to run and maintain the business. The required funds may be raised from short-term sources or long-term sources or a combination of both the sources of funds, so as to equip itself with an appropriate combination of fixed assets and current assets. Generally, capital is raised from two prime sources (a) equity and (b) debt. What should be the proportion of equity and debt in the capital structure of a company?

Notes

- Capital structure refers to the mix of long-term sources of funds, such as equity shares capital, reserves and surpluses, debenture, long-term debt from outside sources, and preference share capital.
- Capital structure is indicated by the equation: Capital structure = Long-term debt + Preferred stock + Net worth or Capital structure = Total assets – Current liabilities.
- Leverage has been defined as, the action of a lever and mathematical advantage gained by it. From the financial management point of view, the term leverage is commonly used to describe the firm's ability to use fixed cost assets or sources of funds to magnify the returns to its owners.
- There are two types of leverages: (i) operating leverage and (ii) financial leverage.
- Operating leverage (OL) refers as the firm's ability to use operating costs to magnify the effects of changes in sales on its earnings before interest and taxes.
- Financial leverage (FL) is the ability of the firm to use fixed financial charges to magnify the effects of changes in EBIT on the firm's earnings per share.

5.6 Keywords

Capital Structure: It is that part of financial structure, which represents long-term sources.

Financial Leverage: Financial leverage (FL) is the ability of the firm to use fixed financial charges to magnify the effects of changes in EBIT on the firm's earnings per share.

Operating Leverage: Operating leverage may be defined as the firm's ability to use operating costs to magnify the effects of changes in sales on its earnings before interest and taxes.

5.7 Self Assessment

Fill in the blanks:

1. Capital structure is that part of ....., which represents long-term sources.
2. The term capital structure refers to the mix of ..... sources of funds.
3. ..... is possible only when there is a mix of debt and equity.
4. From the financial management point of view, ... is commonly used to describe the firm's ability to use fixed cost assets or sources of funds to magnify the returns to its owners.
5. ..... is associated with investment (assets acquisition) activities.
6. Operating leverage may be defined as the firm's ability to use ..... to magnify the effects of changes in sales on its earnings before interest and taxes.
7. ..... results from the presence of fixed financial charges in the income statement.
8. Financial leverage associates with ..... .
9. The issue of debt depends on the future ..... of the company.
10. Small companies and companies with low credit ratings must rely more on ..... market

State whether the following statements are true or false:

11. Company issues preference shares or redeemable debentures when it requires finance.
12. Trading on equity uses the variable cost sources of finance in capital structure of firm.

Notes

13. Optimum leverage is that mix of debt & equity which will maximise the market value of the company.
14. Capital structure that allows the existing capital structure to change according to the changing conditions without increasing the costs is called flexible capital structure.
15. The fixed charges vary with firm's EBIT.

5.8 Review Questions

1. A firm has sales of ₹ 5 lakh, variable cost ₹ 3.5 lakh and fixed cost ₹ 1 lakh, and debt of ₹ 2.5 lakh at 10 per cent.
2. The following data is available for X Ltd:

   Selling price ₹ 120 pu; Variable cost ₹ 70 pu; Total fixed cost ₹ 200,000

   (a) What is the operating leverage when, X Ltd produces and sells 6000 units,

   (b) What is the percentage change that will occurring in the operating profit (EBIT) of X Ltd, if output increases by 5 per cent
3. Calculate operating and financial leverages under situations A, B and C and Financial plan 1,2, and 3 respectively from the following functions of XYZ Co. Also find out the combination of operating and financial leverage that gives the highest value and least value:

   Installed capacity = 12,000 units;

   Actual production & sales = 800 units

   Selling price = ₹ 15 p.u;

   Variable cost = ₹ 10 p.u

   Fixed Cost = Situation A, ₹ 1000; Situation B, ₹ 2000; Situation C, ₹ 3000
4. Define capital structure? Discuss the important factors that should be considered while determining capital structure.
5. What is operating leverage? How does it help to maximize, revenue of a firm?
6. What is trading an equity? How does it maximize the equity earnings?
7. Distinguish between capital structure and financial structure.
8. What basic principles will you advocate in the matter of deciding on a proper constitution of capital structure for a firm?
9. Sales ₹ 1,00,000 units at ₹ 2 per unit, variable cost ₹0.70 per unit, fixed cost ₹1, 00,000, interest charges ₹ 3,668. Compute degree of operating leverage, financial leverage, and combined leverage.
10. Distinguish between operating and financial leverage.

Answers: Self Assessment

1.	financial structure	2.	long-term
3.	Optimum capital structure	4.	leverage
5.	Operating leverage	6.	operating costs
7.	Financial leverage	8.	financing activities

Notes

9. cash flow ability
10. equity capital
11. True
12. False
13. True
14. True
15. False

5.9 Further Readings

Books

Chandra, P., *Financial Management - Theory and Practice*, New Delhi, Tata McGraw Hill Publishing Company Ltd., 2002, p. 3.

Sudhindra Bhat, *Financial Management*, New Delhi, Excel Books, 2008.

Van Horne, J.C. and Wachowicz, Jr, J.M., *Fundamentals of Financial Management*, New Delhi, Prentice Hall of India Pvt. Ltd., 1996, p. 2.

Online links

http://www.fei.org/

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Unit 6: Capital Structure Theory

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Objectives

After studying this unit, you will be able to:

- Discuss theories of capital structure
- Describe Optimum capital structure

Introduction

The Capital structure decision is yet another important area under financial management. Capital structure refers to the mix of proportions of a firm's permanent long-term financing represented by debt, preference capital and equity share Capital.

While taking any financial decisions, the firm must ensure the maximization of wealth of shareholders. So even the Capital structure decision must be taken in the light of wealth maximization objective. That particular mix of debt and equity which maximizes the value of the firm, is known as optimum capital structure.

Notes

Notes **Assumptions of Capital Structure Theories**

1. There are only two sources of funds i.e. debt and equity.
2. The total assets of the company are given and do not change.
3. The total financing remains constant. The firm can change the degree of leverage, either by selling the shares and retiring debt or by issuing debt and redeeming equity.
4. Operating profits (EBIT) are not expected to grow.
5. All the investors are assumed to have the same expectation about the future profits.
6. Business risk is constant over time and assumed to be independent of its capital structure and financial risk.
7. Corporate tax does not exit.
8. The company has infinite life.
9. Dividend payout ratio = 100%.

6.1 Theory of Capital Structure

The long-term source of finance, which a company may use for investments, may be broadly classified into 2 types. They are **debt capital** and **equity capital.** The financial manager must determine the proportion of debt and equity and financial leverage.

There are 4 major theories explaining the relationship between capital structure, cost of capital and valuation of the firm. They are:

1. Net income approach (NI)
2. Net operating income approach (NOI)
3. Traditional approach
4. Modigliani-Miller approach

6.2 Net Income Approach (NI)

According to this approach, the cost of debt and the cost of equity do not change with a change in the leverage ratio. As a result, the average cost of capital declines as the leverage ratio increases. This is because when the leverage ratio increases, the cost of debt, which is lower than the cost of equity, gets a higher weightage in the calculation of the cost of capital.

This approach has been suggested by David Durand. According to this approach, capital structure decision is relevant to the valuation of the firm. According to the theory it is possible to change the cost of capital by changing the debt equity mix. In other words, a change in the capital structure causes a change in the overall of capital as well as the value of the firm.

The formula to calculate the average cost of capital is as follows:

$$K_o = K_d (B/ (B + S)) + K_e (S/(B + S))$$

Notes

Where,

K_o is the average cost of capital

K_d is the cost of debt

B is the market value of debt

S is the market value of equity

K_e is the cost of equity

The NI approach is based on the following assumptions:

1. The use of debt does not change the risk of investors and therefore, cost of debt (Kd) and cost of equity (K_e) remains the same irrespective of the degree of leverage.
2. Cost of debt is less than the cost of equity.
3. The corporate income tax does not exist.

Caution According to the theory, cost of debt is assumed to be less than the cost of equity. Therefore, when the financial leverage is increased (proportion of debt in the total capital), the overall cost of capital will decline and the value of the firm will increase.

The implications of the 3 assumptions of NI approach is that, as the degree of leverage increases, the proportion of a cheaper source of funds (debt) in the capital structure increases. As a result, the weighted average cost of capital tends to decline leading to an increase in the total level of the firm. Thus, even if the cost of debt and cost of equity remains same regardless of leverage, increased use of low cost debt will result in the decline of overall cost of capital and thereby, maximize the value of the firm. So the overall cost of capital will be minimum when the proportion of debt in the capital structure is maximum. Hence, optimum structure exists when the firm employs 100% debt or maximum debt in the capital structure.

Illustration 1: A Company's expected net operating income (EBIT) is ₹ 1,00,000. The company has issued ₹ 5,00,000, 10% debentures at ₹ 100 each. The cost of equity is 12.5%. Assuming no taxes, find out the overall cost of capital and the value of the firm according to NI approach.

Solution:

S = Value of equity shares (NI/K_e) (₹)	4,00,000
Net operating income (₹)	1,00,000
Less: Interest, on debentures (₹)	50,000
Earning available to ESH (NI) (₹)	50,000
Cost of equity (K_e)	12.5%
Value of debt (B) (₹)	5, 00,000
Total Value of the firm (S + B = V) (₹)	9,00,000
Overall cost of capital (EBIT/V)	11.1%

Alternatively, $K_o = K_d$ (W1) + K_e (W2)

$$\frac{5,00,000(0.10)}{9,00,000} + \frac{4,00,000(0.125)}{9,00,000} = 11.1\%$$

Notes

Assuming the market price per share to be ₹ 100, there will be 4000 shares of ₹ 100 each. Find out the effect of increase in leverage on the cost of capital (Ko) and value of the firm.

Assume that the above company increases the debt from ₹ 5,00,000 to ₹ 6,00,000 and the cost of the debt and equity remains at the same level. We can calculate the overall cost of capital, value of the firm and the market value of equity shares as shown below.

EBIT	1,00,000
Less: Int on debt	60,000
Earnings available to ESH (NI)	40,000
K_e	0.125
Value of equity shares (NI/K_e) = S	3,20,000
Value of debt (B)	6,00,000
Value of the firm (S + B = V)	9,20,000

$$K_o = \frac{EBIT}{V} = \frac{1,00,000}{9,20,000} = 10.86\%$$

Alternatively K_o can be calculated as below:

K_o = Kd(W1) + K_e (W2)

$$\frac{6,00,000(0.10)}{9,20,000} + \frac{3,20,000(0.125)}{9,20,000} = 10.87\%$$

Market Value of Equity Shares

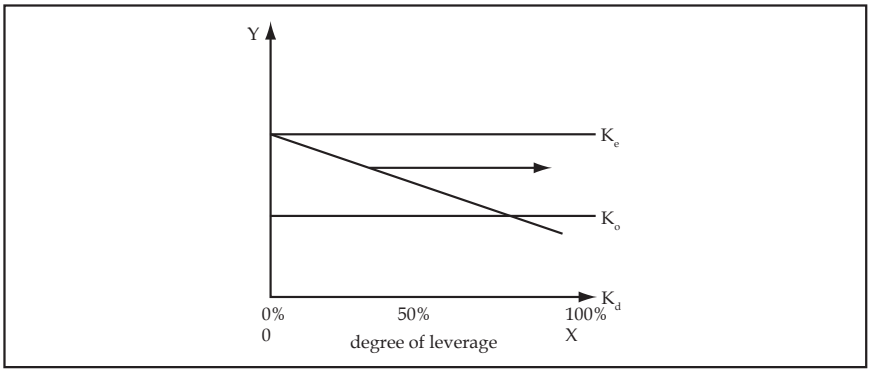
Before increasing the debt, there were 4000 ES of ₹ 100 each . Then the firm increased the debt by ₹ 1,00,000 and used the proceeds to retire equity shares. So the company redeemed 1000 shares of ₹ 100 each. So the number of shares outstanding is 4000 – 1000 = 3000. Therefore, value of 1 equity share is:

$$₹\frac{3,20,000}{3000} = ₹106.67$$

So, the market value of equity shares has increased to ₹ 106.67.

To sum up, according to the NI approach, as the debt content is increased in the capital structure, K_o falls, value of the firm increases and the market value of the equity shares also increases.

We can graph the relationship between K_o, K_e and K_d with the degree of leverage as shown below.



Notes

The degree of leverage is plotted along the X-axis, while the cost of Capital in per cent is plotted on Y-axis. As the cost of debt and cost of equity is constant with leverage, we find that both the curves are horizontal to X-axis. As the degree of leverage increases (% of debt in the total capital increase) overall cost of capital continuously falls. Ko is minimum when, there is 100% debt. So optimum capital structure exists at 100% debt and 0% equity capital. But in practice, 100% debt may not be possible. There should be some equity capital in the capital structure of any company.

6.3 NOI Approach

This theory is also given by David Durand. This is just the opposite to NI approach. According to NOI approach, the capital structure decision is irrelevant and there is nothing like optimum capital structure. All the capital structures are optimum.

According to this theory, the market value of the firm is not affected by the capital structure changes. The market value of the firm is found by capitalizing (dividing) the net operating income by the overall cost of capital, which is constant. The market value of the firm is obtained by using the following formula.

$$V = \frac{NOI}{K_o} = (V = B + S)$$

The overall cost of capital depends on the business risks of the firm, which is assumed to be constant. NOI depends on the investments made by the company and not on the capital structure decisions. So, if NOI and K_o are constant, the value of the firm must remain same regardless of leverage.

Assumptions

The market capitalizes the value of the firm as a whole. Thus, the split between debt and equity is not important. The value of the firm is obtained by capitalizing NOI by the K_o, which depends on the business risks. If business risk is constant, K_o is also constant.

The use of debt increases the risks of shareholders, So, K_e increases with the leverage and eats completely the advantage of low cost debt.

1. Cost of debt remains same regardless of leverage.
2. Corporate income tax does not exist.

The critical assumptions of this approach are that Ko remains same regardless of the degree of leverage. The market capitalizes the value of the firm as a whole and the split between debt and equity is unimportant. The benefits from the increase in the use of cost debt is completely offset (neutralised) by the increases in the cost of equity. So even if the leverage is increased, overall cost of capital remains at the same level. When the company increases the leverage, the firm becomes more risky and equity shareholders penalize the firm by demanding higher and higher rate of returns. So, K_e is the function of the debt equity ratio. Since overall cost of capital structure remains static according to the theory.

Illustration 2: A company's expected annual net operating income (EBIT) is ₹ 1,00,000. The company has 5,00,000, 10% debentures. The overall cost of capital is 12.5%. Calculate the value of the firm and cost of equity according to NOI approach.

Notes

Solution:

Net operating income (EBIT) (₹)	1,00,000
Overall cost of capital (K_o)	0.125
Total value of the firm (V = EBIT/K_o) (₹)	8,00,000
Market value of the debt (B) (Rs)	5,00,000
Total market value of the equity (S = V – B) (Rs)	3,00,000

$$\text{Cost of equity} = \frac{NI}{S} = \frac{\text{earning available to ESH}}{\text{market value of equity shares}}$$

$$K_e = \frac{EBIT - I}{V - B} = \frac{1,00,000 - 50,000}{8,00,000 - 5,00,000} = 16,66\%$$

Market value of equity shares: Assuming the market price of shares to be ₹ 100, there are 3000 shares of ₹ 100 each.

If the company increases the debt from ₹5,00,000 to ₹ 6,00,000 the Ke and the value of the firm are as below:

Net operating income (EBIT) (RS)	1,00,000
Overall cost of capital (Ko)	0.125
Total value of the firm (V=EBIT/Ko)(₹)	8,00,000
Market value of debt (B) (₹)	6,00,000
Market value of the equity (S) (Rs)	2,00,000

$$\text{Cost of equity} = \frac{NI}{S} = \frac{40,000}{2,00,000} = 20\%$$

Market Value of the Equity Shares

The firm has increased the debt by ₹1,00,000 and used the proceeds to reduce equity capital. The number of shares has reduced from 3000 to 2000. Therefore, the price per share can be calculated as below.

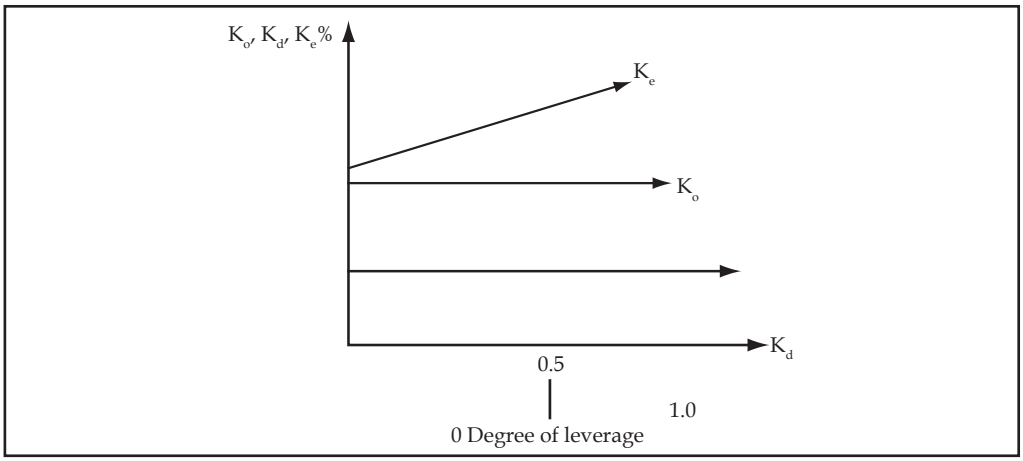
$$\text{Price per share} = \frac{\text{total market value of the shares}}{\text{number of shares}}$$

$$= \frac{2,00,000}{2000} = ₹100.$$

So, there is no change in the price per share, total value of the firm and overall cost of the capital when the leverage is changed.

Notes

NOI approach can be graphically shown as below:



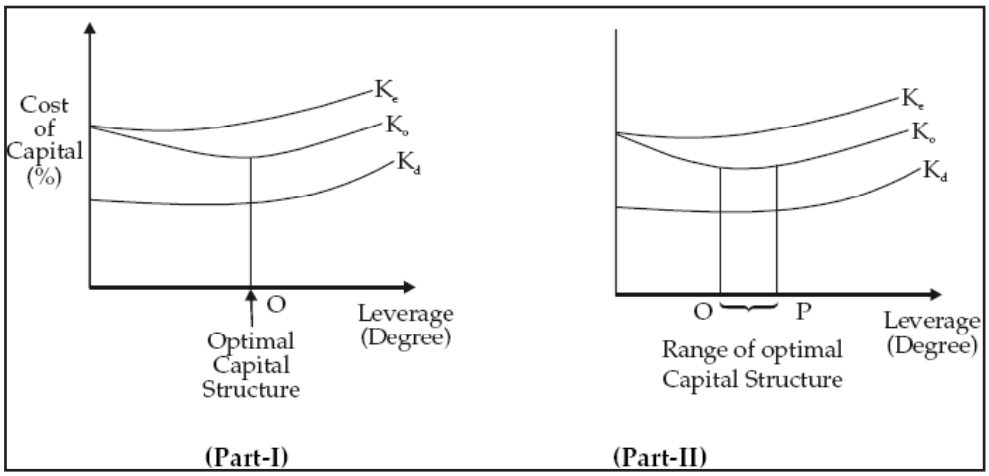
From the above graph, it is clear that, as the degree of leverage is increased, Ko and Kd remains at the same level. But cost of equity increases with leverage and exactly neutralises the benefits of low cost debt. So overall cost of Capital remains at the same level.

6.4 Traditional or Intermediate Approach or WACC Approach

This approach is midway between the NI and the NOI approach. The main propositions of this approach are:

1. The cost of debt remains almost constant upto a certain degree of leverage but rises thereafter, at an increasing rate.
2. The cost of equity remains more or less constant or rises gradually up to a certain degree of leverage and rises sharply thereafter.
3. The cost of capital due to, the behaviour of the cost of debt and cost of equity, decreases upto a certain point and remains more or less constant for moderate increases in leverage, thereafter, rises beyond that level at an increasing rate.

The figure given below describes the traditional Viewpoint on the Relationship between Leverage, Cost of Capital and Value of the form:



Notes

In other words NI approach and NOI approach represents two polar cases. The traditional or the intermediate approach is a midway between these two approaches, because it partly takes the features of both the approaches.

According to the theory, the value of the firm can be increased or cost of capital can be reduced by a judicious mix of debt and equity capital. This approach states that, cost of capital is a function of leverage. So cost of capital decreases upto a certain degree of leverages then it remains at the same level for certain degrees of leverage and thereafter it rises sharply with the leverage. So optimum capital structure exists when the cost of capital is minimum or value of the firm is maximum.

Notes The manner in which cost of capital reacts to the changes in the capital structure can be divided into 3 stages.

1. In the first stage, cost of equity remains constant or rises slightly with the debt. But when it increases, it does not increase fast enough to offset the advantage of low cost debt. Cost of debt also remains same or rises slightly with the leverage. As the cost of debt is less than cost of equity, increased use of debt reduces the cost capital during the 1st stage.
2. Once the firm has reached the certain degree of leverage, increased use of debt does not result in the fall in the overall cost of capital. This is due to the fact that, benefits of low cost debt are offset by the increase in the cost of equity. Within this range, cost of capital will be minimum or value of the firm will be maximum.
3. Beyond a certain point, use of debt has unfavourable effect on cost of capital and value of the firm. This happens because the firm would become more risky to the investors and hence they would penalize the firm by demanding higher return. Here, advantages of using low cost debt are less than the disadvantages of higher cost of equity. So the overall cost of capital increases with leverage and value of the firm decreases.

Illustration 3: Assume that the firm has EBIT of ₹ 4,00,000. The firm has 10% debentures of ₹ 10,00,000 and the cost of equity is 16%. Find out the value of the firm and overall cost of capital according to the traditional approach.

EBIT (₹)	4,00,000
Less: Interest (₹)	1,00,000
Earnings available to ESH (₹)	3,00,000
Cost of equity	0.16
Market value of the equity shares (₹) NI/Ke = 3,00,000/0.16	18,75,000
Market Value of the debt (B)	10,00,000
Total Value of the firm (S + B)	28,75,000

Overall cost of capital (K_o) = $\frac{EBIT}{V} = \frac{4,00,000}{28,75,000} = 13.9\%$

Now, let us assume that the firm increases the debt to another ₹ 5,00,000. So cost of debt increases to 11% and cost of equity rises to 17%. Calculate the overall cost of capital and the value of the firm.

Notes

EBIT (₹)	4,00,00,00
Less: Interest (₹)	1,65,000
Earnings available to ESH (₹)	2,35,000
Cost of equity	0.17
Value of equity shares (S = NI / Ke) (₹)	13,82,352
Value of debt (₹)	15,00,000
Value of the firm (V)(₹)	28,82,352

Overall cost of capital $K_o = \frac{EBIT}{V} = \frac{4,00,000}{28,82,353} = 13.8\%$

If the debt is further increased to ₹ 5,00,000 the cost of debt increases to 12.5% and the cost of equity is increased to 20%. Find out the overall cost of capital and value of the firm.

EBIT	4,00,000
Less: Interest (₹)	2,50,000
Earning available to ESH (₹)	1,50,000
Cost of equity	0.20
Value of equity shares (S = NI/Ke)	7,50,000
Value of debt (B) (₹)	20,00,00
Value of the firm (V = S + B) (₹)	27,50,000

Overall cost of capital $K_o = \frac{EBIT}{V} = \frac{4,00,000}{27,50,353} = 14.5\%$

6.5 Modigliani Miller Approach (MM)

MM theory relating to the relationship between cost of capital and valuation is similar to the NOI approach. According to this approach, the value of the firm is independent of its capital structure. However, there is a basic difference between the two. The NOI approach is purely a definitional term, defining the concept without behavioural justification. MM approach provides analytically sound, logically consistent, behavioral justification in favour of the theory and considers any other theories of Capital structure as incorrect.

Assumption

Capital markets are perfect. This means,

1. Investors are free to buy and sell securities.
2. Inventors can borrow and lend money on the same terms on which a firm can borrow and lend.
3. There are no transaction costs.
4. They behave rationally.
5. Firms can be classified into homogenous risk categories. All the firms within the same class will have the same degree of business risks.
6. All the investors have the same expectations from a firm's NOI with which to evaluate the value of the firm.

Notes

7. Dividends Payout ratio is 100% and there are no retained earnings.
8. There are no corporate income taxes. This assumption is removed later.

Caution There are three basic propositions of MM approach:

1. The overall cost of capital (K_O) and the value of the firm (V) are independent of leverage. The K_o and V are constant for all the degree of leverage. The total value of the firm is obtained by capitalizing the EBIT at a discount rate appropriate for its risks class.
2. Cost of equity (K_e) is equal to the capitalization rate of a pure equity stream plus a premium for financial risk. The financial risks increases with the leverage and therefore, K_e increases in a manner to offset exactly the benefit from the use of low cost debt.

$$K_e = K_o + (K_o - K_d)\ B/S.$$

3. The cut-off rate for investment purposes is completely independent of the way in which an investment is financed. This is true because cost of capital remains same regardless of the degree of leverage. So both, investment decision and financing decision are independent.

6.5.1 Proof of MM Argument

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

Did u know? **What is Arbitrage?**

The term arbitrage refers to the act of buying a security in the market, where the price is less and simultaneously selling it in another market where the price is more, to take advantage of the difference in price prevailing in two different markets.

The operational justification for the MM hypothesis is the "Arbitrage Argument". The term arbitrage refers to the act of buying a security in the market, where the price is less and simultaneously selling it in another market where the price is more, to take advantage of the difference in price prevailing in two different markets.

Suppose two identical firms, except for their capital structures, have different market values.

In this situation, **arbitrage** (or **switching**) will take place to enable investors to engage in the **personal** or **homemade leverage as against the corporate leverage**, to restore equilibrium in the market. On the basis of the arbitrage process, MM conclude that the market value of a firm is not affected by leverage. Thus, the financing (or capital structure) decision is irrelevant. It does not help in creating any wealth for shareholders. Hence one capital structure is as much desirable (or undesirable) as the other.

Arbitrage process helps to bring equilibrium in the market. Because of arbitrage, a security cannot be sold at different prices in different markets. MM approach illustrates the arbitrage process with reference to valuation in terms of two firms, which are exactly similar in all aspects with respect to leverage, so that one of them has debt in the capital structure while other does

not. Such homogenous firm's are, according to MM, perfect substitutes. If the market value of the two firms which are exactly same in all the respects, except with the leverage, which is not equal, investors of the overvalued firm would sell their shares, borrow additional funds on their personal account and invest in the undervalued firm, in order to obtain the investors for arbitrage is termed as home-made or personal leverage. So investor undertaking arbitrage would be better off. This behaviour of arbitrage will have investors of overvalued firm. Arbitrage would be counting till the market prices of two identical firms become identical.

Reverse Working of Arbitrage Process

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

Illustration 4: The operation of arbitrage process is illustrated below.

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

FIRM L	FIRM U	
EBIT	80,000	80,000
Less:Interest	50,000	–
Earnings available to ESH (NI)	30,000	80,000
Cost of equity (Ke)	0.16	0.125
Market value of equity shares (S = NI/Ke)	1,87,500	6,40,000
Market value of debt	5,00,000	------
Total value of the firm	6,87,500	6,40,000
$K_O = \frac{EBIT}{V} =$	11.63%	12.5%

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

6.5.2 Working of the Arbitrage Process

The following example illustrates the working of arbitrage process:

Illustration 4: Suppose there is an investor X, who holds 10% of the outstanding shares in the firm L. This means his holding amounts to ₹ 18,750 and his shares in the earning which belongs to equity shareholders is ₹ 3000 (10% of ₹ 30,000). Mr. X will sell his holding in the firm L and invest money in the firm U. The firm U has no debt in the capital structure and hence, the financial risk to Mr. X would be less in the firm U than firm L . In order to have the same degree of financial risk as of the firm U, Mr. X will borrow additional funds equal to his proportionate shares in substituted personal leverage in place of corporate leverage.

Notes

The position of Mr.X is summarized as below.

Firm L

Investment amount	(10% holding)	18,750
Dividend income	(10% of 30000)	3,000
Return on funds	$\frac{3000}{18,750} = 16\%$	

Firm U

Investment amount (18,750 + 50,000)	=	68,750

(50,000 borrowed at 10%)

$$\text{Total income} \frac{68,750}{6,40,000} \times 80,000 = 8,593.75$$

Less: Interest on loan	5,000
Return on investment	3,593.75

$$ROI = \frac{3,593.75}{18,750} = 19.16\%$$

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

Caution Impact of the corporate taxes

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

Symbolically:

VL = VU + BT

VL = Value of levered firm

Vu= Value of unlevered firm

6.6 Optimum Capital Structure

In taking a financing decision, the financial manager's job is to come out with an optimum capital structure. Optimum capital structure is that capital structure at that level of debt - equity proportion, where the market value per share is maximum and the cost of capital is minimum. The same to quote, Ezra, "optimum leverage is that mix of debt and equity which will maximise the market value of the company and minimise the company's overall cost of capital."

The optimum capital structure keeps balance between share capital and debt capital. The primary reason for the employment of debt by an enterprise can be stated as upto a certain point, debt is from the point of view of the ownership, a less expensive source of funds than equity capital. Hence, optimum capital structure keeps a balance between debt capital and equity capital.

Notes

An appropriate capital structure should have the following features:

1. ***Profitability/Return:*** As we have seen in the above discussion the appropriate capital structure is one, which is most advantageous. With the constraints, maximum use of leverage at a minimum cost should be made. In other words, it should generate maximum returns to the owners without adding additional cost.
2. ***Solvency/Risk:*** The use of more or excessive debt threatens the solvency of the firm. Debt should be used till the point where, debt does not add significant risk, otherwise use of debt should be avoided.
3. ***Flexibility:*** Flexible capital structure means it should allow the existing capital structure to change according to the changing conditions without increasing cost. It should also be possible for the firm to provide funds whenever needed to finance its possible activities. The Firm should also repay the funds if not required.
4. ***Conservation/Capacity:*** Capital should be conservative in the sense that the debt capacity of a firm should not be exceeded. In other words, the capital structure should be determined within the debt capacity of the firm and not beyond the firm's capacity. The debt capacity of a firm depends on its ability to generate future cash inflows. It should have enough cash to pay its fixed charges and principal sum.
5. *Control:* Use of more equity may lead to loose my control of the company. The competitors from (closely held firms) are particularly concerned about the dilution of control. Hence, construction of capital structure should not involve the risk of loss of control over the firm.

6.6.1 Computation of Optimum Capital Structure

As we already know that optimum capital structure is that capital structure at debt equity proportion where the market value per share and value of the firm is maximum or the overall cost of capital is minimum. But here, since, calculation of market value of share or value of the firm is beyond the scope of this book. Hence, capital structure is calculated based on overall cost of capital.

Illustration 5: In considering the most desirable capital structure of a company. Financial manager has estimated the following.

Debt as a % of total Capital Employed	Cost of Equity (%)	Cost of Debt (%)
0	10.0	6.0
10	10.0	6.0
20	10.5	6.0
30	11.0	6.5
40	12.0	7.0

You are required to determine the optimal debt - equity mix or optimal capital structure by the calculation of overall cost of capital.

Notes

Solution:

Calculation of overall cost of capital

Equity Weight (W_e)	Debt Weight (Wd)	Cost of Equity (K_c)	Cost of Debt (K_d)	Overall cost of Capital (Ko = %) $K_o = [K_c (W_e) + K_d (W_d)] \times 100$
1.00	0.00	0.100	0.06	[(0.10 x 1.0) + (0.06 x 0.0)] x 100 = 10
0.90	**0.10**	0.100	0.06	[(0.10 x 0.90) + (0.06 x 0.10)] x 100 = **9.6**
0.80	0.20	0.105	0.06	[(0.105 x 0.80) + (0.06 x 0.20)] x 100 = 9.68
0.70	0.30	0.110	0.065	[(0.11 x 0.70) + (0.065 x 0.30)] x 100 = 9.65
0.60	0.40	0.120	0.07	[(0.12 x 0.60) + (0.07 x 0.40)] x 100 = 10

Here optimal capital structure is one, with 90 per cent equity and 10 per cent debt since K is less (9.6).

6.6.2 Approaches to Determine Appropriate Capital Structure

The following are the approaches to determine a firm's capital structure: 1. EBIT - EPS Approach 2. Valuation Approach and 3. Cash flow Approach

1. ***EBIT - EPS Approach:*** This approach is helpful to analyse the impact of debt on earnings per share.
2. ***Valuation Approach:*** This approach determines the impact of debt use on the shareholder value.
3. ***Cash Flow Approach:*** This approach analyses the firm's debt service capacity.

EBIT - EPS (Approach) Analysis

EBIT - EPS analysis try to understand how sensitive earnings per share (EPS) are to the changes in earnings before interest and tax (EBIT) under different financial plans/capital structures/ alternatives. Use of fixed cost sources of finance in capital structure of a firm is known as financial leverages / trading on equity. In other words, use of less cost source of finance to maximise earnings per share (EPS), but the benefits are more when a firm uses debt as a source of finance, due to cheap and interest is tax deductible source. Use of debt can be used to maximise shareholder wealth only when a firm has a high level of operating profit (EBIT). EBIT - EPS analyses is one way to study the relation between earnings per share (EPS) and various possible levels of operating profit (EBIT), under various financial plans.

Illustration 6: XYZ Co. Ltd. has a share capital of ₹ 1,00,000 face value of ₹ 10 each. It requires ₹ 50,000 to finance expansion programme and is considering three alternative financial plans.

(i) Issue of 5000 ordinary shares of ₹ 10 each

(ii) Issue of 500 preference shares of ₹ 100 each at 10 per cent and

(iii) Issue of 10 per cent debentures of ₹ 50,000

The company's operating profit (EBIT) after additional investment is ₹ 40,000 per annum. Tax rate is 50 per cent. Show the effect of use of debt in financial plan.

Solution:

Notes

Calculation EPS

Particulars		Financial Plan		
		I (Equity)	II (Preference)	III Debt - Equity
		₹	₹	₹
EBIT		40,000	40,000	40,000
Less : Interest		---	---	5,000
EBT / or PBT		40,000	40,000	35,000
Less : Tax at 50%		20,000	20,000	17,500
PAT or EAT		20,000	20,000	17,500
Less: Preference dividend		---	5,000	---
Earnings available to share holders.		20,000	15,000	17,500
No. of shares outstanding		15,000	10,000	10,000
EPS =	Earnings available to shareholder / No. of equity shares	**1.333**	**1.5**	**1.75**

Illustration 7: VS International Ltd., has a capital structure (all equity) comprising of ₹ 5,00,000 each share of ₹ 10. The firm wants to raise an additional ₹ 2,50,000 for expansion project. The firm has the following four alternative financial plans I, II, III and IV. If The firm is able to earn an operating profit at ₹ 80,000 after additional investment and 50 per cent tax rate. Calculate EPS for all four alternatives and select the preferable financial plan. Financial plans

I. Raise the entire amount in the form of equity capital.

II. Raise 50 per cent as equity capital and 50 per cent as 10 per cent debt capital.

III. Raise the entire amount as 12 per cent debentures.

IV. Raise 50 per cent equity capital and 50 per cent preference share capital at 10 per cent.

Solution

Calculation of EPS

Particulars.	Financial Plan			
	I	II	III	IV
	₹	₹	₹	₹
EBIT	80,000	80,000	80,000	80,000
Less: Interest	---	12,500	30,000	---
EBT	80,000	67,500	50,000	80,000
Less: Tax at 50%	40,000	33,750	25,000	40,000
EAT	40,000	33,750	25,000	40,000
Less: Preference dividend	---	---		12500
Earnings available to share holders.	40,000	33,750	25000	27500
No. of shares (equity) outstanding	75,000	62,500	50,000	62,500
EPS	**0.53**	**0.54**	**0.50**	**0.44**

As EPS is maximum as per plan-II, this is most-preferable financial plan.

Indifference Point

The break-even EBIT level of indifference point, is when the EPS is same for two alternative capital structures. It may be defined as the level of EBIT beyond which the benefits of financial leverage begin to operate with respect to earnings per share (EPS). In other words, if the expected

Notes

level of EBIT is less than the indifference point, it is advantageous with the use of equity capital to maximise EPS.

Indifference point between two capital structures can be obtained by using the following formula:

$$\frac{(x - I_1)(1-t) - PD(1+Dt)}{ES_1} = \frac{(x - I_2)(1-t) - PD(1+Dt)}{ES_2}$$

Where

X = EBIT I1I2 = Interest under alternatives 1 and 2

t = Tax rate PD = Preference dividend

Dt = Preference dividend tax

ES_1, ES_2 = No. of equity share outstanding under alternative 1 and 2

Illustration 8: WDC Ltd., has a total capitalisation of ₹ 10 lakh consisting entirely of equity capital (₹ 10 each share). It is planning to raise an additional funds of ₹ 5 lakh for implementing capital budgeting project. There are two alternatives available to the company.

a) Entire equity share capital by issue of shares.

b) Entire amount by debt at 10 per cent interest.

The company is in the tax brackets of 50 per cent. Calculate indifference point.

Solution:

Indifference point formula

$$\frac{(x - I_1)(1-t) - PD(1+Dt)}{ES_1} = \frac{(x - I_2)(1-t) - PD(1+Dt)}{ES_2}$$

$$\frac{(x - I)(1\text{-}0.5)}{ES_1} = \frac{(x\text{-}1)(1\text{-}0.5)}{ES_2}$$

$$\frac{x\ (1\text{-}0.5)}{(1,00,000 + 50000)} = \frac{(x\text{-}50,000)\ (1\text{-}0.5)}{1,00,000}$$

$$\frac{0.5x}{1,50,000} = \frac{0.5x\text{-}25000}{1,00,000}$$

$$50,000x = 75,000x - 3,75,00,00,000$$

$$3,75,00,00,000 = 75,000x - 50,000x$$

$$= 25,000x$$

$$x = 3,75,00,00,000/25,000$$

$$x = \text{Rs. } 150,000$$

Notes

Calculation of EPS

Particulars.		Financial Plan			
		Alternative 'A'		Alternative 'B'	
		₹		₹	
EBIT		1,50,000		1,50,000	
Less : Interest		---		50,000	
EBT / or PBT		1,50,000		1,00,000	
Less : Tax at 50%		75,000		50,000	
EAT		75,000		50,000	
Less : Preference dividend		---		---	
Earnings available to share holders.		75,000		50,000	
No. of shares (existing + new)		(1,00,000 + 50,000)		(1,00,000 + 0)	
EPS =	Earnings available to share holders.	75,000	= 0.5	50,000	= 0.5
	No. of equity shares	1,50,000		1,00,000	

2. ***Valuation Approach:*** The following are the key assumptions of valuation approach:

   - The firm should employ debt to the point where the marginal benefits and costs are equal.
   - This will be the point of maximum value of the firm and minimum weighted average cost of capital.
   - The difficulty with the valuation framework is that managers find it difficult to put into practice.
   - The most desirable capital structure is the one that creates the maximum value.

3. ***Cash Flow Approach:*** In determining a firm's target capital structure, a key issue is the firm's ability to service its debt. The focus of this analysis is also on the risk of cash insolvency the probability of running out of the cash given a particular amount of debt in the capital structure. This analysis is based on a thorough cash flow analysis and not on rules of thumb based on various coverage ratios.

   Cash flow approach to assessing debt capacity involves the following steps:

   (a) Specify the tolerance limit on the probability of default. This reflects the risk attitude of management. Is it willing to accept a 0 percent, 5 percent, 10 percent or whatever, probability of default on its debt commitment?

   (b) Estimate the probability distribution of cashflows, taking into account the projected performance of the firm.

   (c) Calculate the fixed charges by way of interest payment and principal repayment associated with various levels of debt.

   (d) Estimated the debt capacity of the firm as the highest level of debt which is acceptable, given the tolerance limit, the probability distribution and the fixed charged defined above.

Illustration 9: The cash flow approach may be illustrated with the help of information for Phoenix Limited which is as follows:

Tolerance Unit: The management of the company does not want the likelihood of cash insolvency to exceed 5 percent.

Notes

Probability Distribution of Cash flow: Based on current conditions and projected performance the management believes that the expected cash flow will be ₹ 50 million with a standard deviation of ₹ 30 million. The cash flow would be normally distributed. The initial cash balance of the company is ₹ l1.26 million.

Fixed Charges: The annual fixed charges associated with various levels of debt would be as follows:

Level of Debt	Annual Fixed Charges
Upto ₹ 5 million	₹ 0.25 million for every ₹ 1 million of debt
Between ₹ 5 million and ₹ 10 million	₹ 0.26 million for every ₹ 1 million of debt
Between ₹ 10 million and ₹ 15 million	₹ 0.27 million for every ₹ 1 million of debt

Debt Capacity: Given the above information the debt capacity may be established as follows:

1. Since the cash flow is normally distributed the following variable has a standard normal distribution (Z distribution):

$$\frac{\text{cash inflow} - \text{Mean value of cash inflow}}{\text{Standard deviation of cash inflow}}$$

2. The Z value corresponding to 5 per cent cumulative probability (which reflects the risk tolerance of the management) is -1.645.

3. Since μ = ₹ 50 million, σ = ₹ 30 million and the Z value corresponding to the risk tolerance limit is -1.645, the cash available from the operations of the firm to service the debt is equal to X which is defined as:

$$\frac{X-50}{30} = -1.645$$

This means X = ₹ 0.65 million.

4. The total cash available for servicing the debt will be equal to:

₹ 0.65 milllion (cash available from operations)

+ ₹ 1.26 million (initial cash balance)

= ₹ 1.91 million.

5. The level of debt that can be serviced with ₹ 1.91 million is a follows:

Amount	Annual fixed charges
₹ 5.00 million	0.25×5.00 = ₹ 1.25 million
₹ 2.54 milliion	0.26×2.54 = ₹ 0.66 million
₹ 7.54 million	₹ 1.91 million

Task If debt is cheaper than equity, why do companies not finance their assets with 80 per cent or 90 per cent debt ratio?

The capital structure is the mixture of the various types of long-term sources of funds namely, equity share including retained earnings, preference shares debentures and long-term loans from financial institution. It is also known as financial structure.

Companies can use any source of finance for their assets requirements. The required capital can be raised through any one of the following financial plans.

1. Fully equity share capital plan,

Contd...

Notes

2. Fully debt capital plan,
3. Fully preference share capital plan,
4. Combination of (a) and (b) in different proportions,
5. A combination of (a), (b) and (c) in different proportions, and
6. A combination of (a) and (c) in different proportions and so on.

Of all the sources of long-term finance, debt is the cheapest source no doubt, because the interest paid on debt is allowed for tax purpose. The company can save tax due to the interest, but company cannot use debt beyond certain limit, up to certain limit use of debt reduces overall cost of capital; beyond the limit it will increase. This can be illustrated with the following example.

Finance source and their cost	Plan 1	Plan 2	Plan 3	Plan 4	Plan 5	Plan 6	Plan 7
Debt as a percentage of total capital	0	10	20	30	40	50	60
Debt cost (Kd %)	7	7	7	7.5	8	8.5	9.5
Cost of Equity (Ke %)	15	15	15.5	16	17	19	20

You are required to find out optimal debt-equity mix of the company.

6.7 The Trade off Theory: Cost of Financial Distress and Agency Cost

As the debt equity ratio (ie leverage) increases, there is a trade-off between the interest tax shield and bankruptcy, causing an optimum capital structure, D/E*

The Trade-Off Theory of Capital Structure is a theory in the realm of Financial Economics about the corporate finance choices of corporations. Its purpose is to explain the fact that firms or corporations usually are financed partly with debt and partly with equity. It states that there is an advantage to financing with debt, the tax benefit of debt and there is a cost of financing with debt, the costs of financial distress including bankruptcy costs of debt and non-bankruptcy costs e.g. staff leaving, suppliers demanding disadvantageous payment terms, bondholder/stockholder infighting, etc.

Trade-Off Model

Financial distress costs (includes bankruptcy)

1. ***Direct costs:*** Lawyer's fees, court costs, administrative expenses, assets disappear or become obsolete
2. ***Indirect costs:*** Managers make short-run decisions; customers and suppliers may impose costs

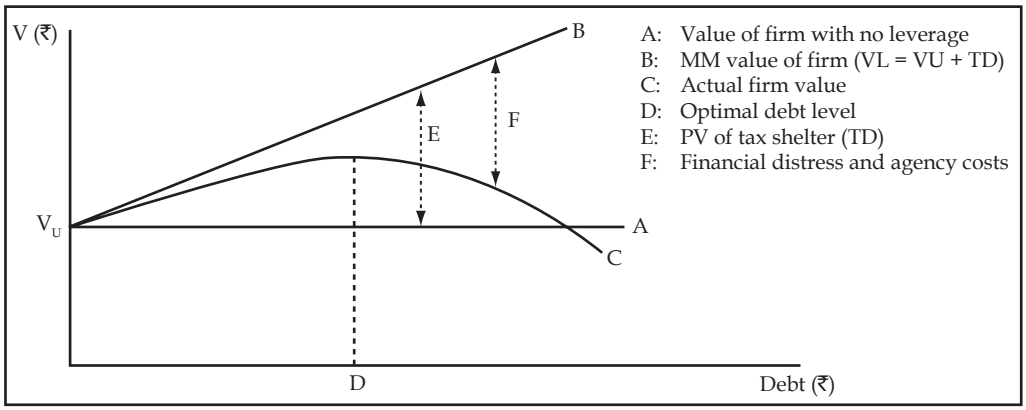
Agency costs

More debt is likely to be experienced. Distress stockholders (thus management) want risk, while bondholders do not.

Use covenants to align interests costs: monitoring to ensure they are followed; also may hamper business. In essence, lost efficiency and monitoring costs reduce advantage of debt, given agency costs and financial distress.

VL = VU + TD – (PV of expected costs of financial distress) – (PV of agency costs)

Notes



Case Study

Sushma Enterprises

Sushma Enterprises was set up in 1950 as a public limited company to manufacture goods used for decoration in drawing rooms. The company is situated in Calicut and it distributes its products throughout the western region of the country. The company expects to earn just over ₹ 30,00,000 and expects sales of ₹ 33,00,000 next year. Variable costs will stay at approximately the same percentage of sales and fixed costs will not increase next year.

Recently the management is seized with investigating the possibility of diversifying the production activities to manufacture small metallic fountains for residential purposes and marble statues to be placed in public gardens. Both products would be compatible with Sushma's existing product line and neither would require any increase in net working capital.

Mr. Arvind, the Production Manager, has been entrusted with the task of analyzing the new product proposals. He estimates that the company would require an investment of ₹ 9,00,000 for the fountains and ₹ 11,00,000 for the statues. In either case, it would take less than 80 days to install the equipment, so production could begin by January 1st.

Mr. Prakash the Sales Manger, estimates that the company could sell fountains, worth ₹ 6,00,000 and ₹ 9,00,000 of statues annually. The company's cost accountant predicts variable cost of two-thirds of sales for the fountains and 64 per cent for the statues. Fixed cost is estimated to be around ₹ 90,000 and ₹ 1,90,000 respectively.

The management requested Mr. Sahu, the Finance manager, to find out sources of funds that could be obtained for financing the additional requirements and the terms and conditions of financing. Mr Sahu after investigating the capital market of the country, submitted to the management that, the company could borrow upto ₹ 25,00,000 by floating 25 year bonds at 6 per cent for either or both the projects. The company could also raise funds by issuing preferred stock with 8 per cent dividend upto ₹ 11,00,000. He informed the management that the common stock financing would not be currently available.

Performa Income Statement and Balance Sheet of Sushma Enterprises are shown in Exhibits 1 and 2 below.

Contd...

Notes

Exhibit 1: Performa Income Statement For December 31, 2001

Sales	30,00,000
Variable Cost	18,56,000
Marginal Contribution	11,44,000
Fixed Costs	5,60,000
Earnings before interest and tax (EBIT)	5,84,000
Interest	80,000
Earning before tax (EBT)	5,04,000
Taxes	2,62,000
Net Income after tax	2,42,000

Exhibit 2: Performa Balance Sheet For December 2001

Liabilities	₹	Assets	₹
Current Liabilities	3,00,000	Cash	1,40,000
Long-term debt 10%	8,00,000	Accounts Receivable	3,00,000
Common stock (₹ 2%)	4,00,000	Inventory	2,40,000
Retained earnings	15,80,000	Fixed Assets	24,00,000
Total	30,80,000	Total	30,80,000

Normal profit margin is 20 per cent and normal asset turnover is 1.2/1

Questions

1. What will be the effect on EPS of the company in each financing alternative and how the acceptance of each project will affect the leverage.
2. Without the new projects, what would the firms operating, fixed shares, and combined leverage be, the next year? Does it have a favourable financial leverage?

6.8 Summary

- Capital structures refers to the mix of different sources of long terms funds such as debt, preference capital and equity capital in the total capitalization of a company. There are difference of opinion on the relationship between capital structure, cost of capital and valuation.
- According to the NI approach overall cost of capital continuously decreases as and when the debt content is increased in the capital structure. So optimum capital structure exists when the firm borrows maximum.
- NOI is just opposite to NI approach and argues that capital structure is irrelevant. According to the theory, Ko depends on business risk, which is assumed to be constant. So, K_O does not change when leverage is changed.
- The MM approach to capital structure is akin to that of NOI approach and argues that capital structure is irrelevant.
- According to the traditional approach, Ko decreases with the leverage in the beginning, then reaches the minimum point and rises thereafter. So optimum capital structure exists according to the theory. Thus traditional theory strikes a balances between NI and NOI approach.

Notes

6.9 Keywords

EBIT-EPS Approach: This approach determines the impact of debt on earnings per share.

MM Theory: According to this theory the value of the firm is independent of its capital structure.

Net Income Approach: According to this approach, the cost of debt and the cost of equity do not change with a change in the leverage ratio.

NOI Approach: According to this approach, the market value of the firm is not affected by the capital structure changes.

Optimum Capital Structure: It is that capital structure where market value per share is maximum and the cost of capital is minimum.

WACC Approach: It is midway between NI and NOI approaches.

6.10 Self Assessment

Fill in the blanks:

1. According to ....., capital structure decision is relevant to the valuation of the firm.
2. NI approach assumes that cost of debt is ..... than the cost of equity.
3. According to NOI approach, the capital structure decision is irrelevant and there is nothing like ..... .
4. According to ....., the value of the firm is independent of its capital structure.
5. Arbitrage process helps to bring ..... in the market.
6. The ..... keeps balance between share capital and debt capital.
7. ..... is helpful to analyse the impact of debt on earnings per share.
8. ..... analyses the firm's debt service capacity.

State whether the following statements are true or false:

9. Net income approach of capital structure was propounded by David Durand.
10. According to NI approach the cost of debt and the cost of equity change with a change in the leverage ratio.
11. According to NI theory, cost of equity is assumed to be less than the cost of debt.
12. Net operating income (NOI) theory is propounded by David Durand.
13. According to NOI theory, the market value of the firm is not affected by the capital structure changes.
14. The WACC approach is midway between the NI and NOI approach.
15. According to WACC approach, the cost of debt remains almost constant up to certain degree of leverage but decreases thereafter at an increasing rate.

Notes

6.11 Review Questions

1. What is the relationship between leverage and cost of capital according to NI and NOI approach?
2. What are the main propositions of MM approach?
3. There is nothing like optimum capital structure for a firm. Critically evaluate the statement.
4. Write briefly a note on the arbitrage process.
5. Briefly explain the traditional approach of capital structure.
6. What do you mean by appropriate capital structure? What are the features?
7. Explain the factors that determine the capital structure for a firm.
8. Illustrate the arbitrage process with suitable example.
9. Write a note on Trade Off theory.
10. What are the key features of an optimum capital structure?

Answers: Self Assessment

1.	NI approach	2.	less
3.	optimum capital structure	4.	MM approach
5.	equilibrium	6.	optimum capital structure
7.	EBIT-EPS approach	8.	Cash flow approach
9.	True	10.	False
11.	False	12.	True
13.	True	14.	True
15.	False		

6.12 Further Readings

Books

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Unit 7: Capital Budgeting

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Objectives

After studying this unit, you will be able to:

- Define meaning and definition of capital budgeting
- Describe process of capital budgeting
- Explain methods of capital budgeting

Introduction

Capital project planning is the process by which companies allocate funds to various investment projects designed to ensure profitability and growth.

Evaluation of such projects involves estimating their future benefits to the company and comparing these with their costs.

In a competitive economy, the economic viability and prosperity of a company depends upon the effectiveness and adequacy of capital expenditure evaluation and fixed assets management.

7.1 Meaning and Definition of Capital Budgeting

Capital budgeting refers to planning the deployment of available capital for the purpose of maximizing the long-term profitability of the firm. It is the firm's decision to invest its current funds most efficiently in long-term activities in anticipation of flow of future benefits over a series of years.

In other words, Capital budget may be defined as the firm's decision to invest its current funds most efficiently in the long-term assets in anticipation of an expected flow of benefits over a series of years. Therefore, it involves a current outlay or series of outlay of cash resources in return for an anticipated flow of future benefits.

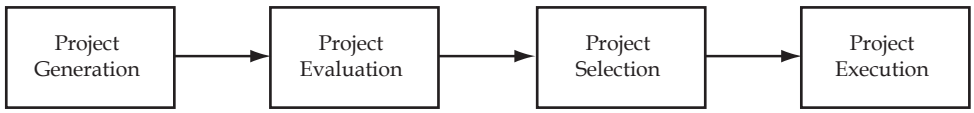
Notes

Note Capital budgeting involves:

1. The search for new and more profitable investment proposals
2. The making of an economic analysis to determine the profit potential of each investment proposal.

7.2 Capital Budgeting Process

Figure 7.1: Exhibits Capital Budgeting Process



While steps are essential to any capital budgeting process, but individual situations of capital budgeting may demand other steps relevant to the situation to make the process an effective one:

1. ***Project Generation:*** Investment proposals of various types may originate at different levels within a firm. The investment proposals may fall into one of the following categories.
   (a) Proposals to add new product to the product line.
   (b) Proposal to expand capacity in existing product lines.
   (c) Proposals to reduce the costs of the output of the existing at any level; from top management level to the level of the workers. The proposals may originate systematically or haphazardly.

Notes **Principles of Capital Budgeting**

Capital expenditure decisions should be taken on the basis of the following factors:

1. ***Creative search for profitable opportunities:*** Profitable investment opportunities should be sought to supplement existing proposals.
2. ***Long-range capital planning:*** It indicates sectoral demand for funds to stimulate alternative proposals before the aggregate demand for funds is finalized.
3. ***Short-range capital planning:*** It indicates sectoral demand for funds to stimulate alternative proposals before the aggregate demand for funds is finalized.
4. ***Measurement of project work:*** Here, the project is ranked with the other projects.
5. ***Screening and selection:*** The project is examined on the basis of selection criteria, such as the supply cost of capital, expected returns alternative investment opportunities, etc.
6. ***Retirement and disposal:*** The expiry of the life cycle of a project is marked at this stage.
7. ***Forms and procedures:*** These involve the preparation of reports necessary for any capital expenditure programme.

Notes

2. ***Project Evaluation:*** Project Evaluation involves two steps:

   (a) Estimation of benefits and costs. The benefits and costs must be measures in terms of cash flows.

   (b) Selection of an appropriate criterion to judge the desirability of the project.

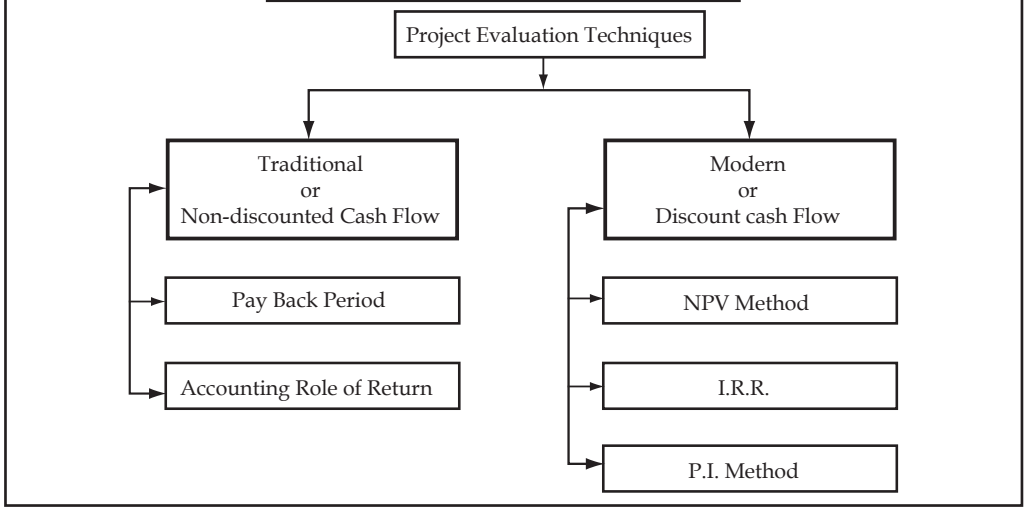
3. ***Project Selection:*** Since capital budgeting decisions are of considerable significance, the final approval of the project may generally rest on the top management. However, projects are screened at multiple levels.

4. ***Project Execution:*** The funds are appropriated for capital expenditure after the final selection of investment proposals. The formal planning for the appropriation of funds is called the capital budget. The project execution committee or the management must ensure that the funds are spent in accordance with appropriations made in the capital budget.

7.3 Methods of Capital Budgeting

There are many methods for evaluating and ranking the capital investment proposals. In all these methods, the basic method is to compare the investments in the projects regarding the benefits derived.

Figure 7.2: Techniques of Project Evaluation



1. Traditional Methods:

   (a) Payback period method

   (b) Accounting rate of return method

2. Discounted cash flow methods:

   (a) The net present value of method

   (b) Internal rate of return

   (c) Profitability index or benefit-cost-ratio

Caution It should be kept in mind that different firms may use different methods. Which method is appropriate to a specific project of the firm, depends upon the relevant circumstances of the proposed project under evaluation.

Notes

7.3.1 Traditional Techniques or Non-discounted Cash Flow Techniques

The traditional techniques are further subdivided into two, such as:

1. Pay back period, and
2. Accounting Rate of Return or Average Rate of Return (ARR).

Pay Back Period

Pay back period is one of the most popular and widely recognized technique of evaluating investment proposals. Pay back period may be defined as that period required, to recover the original cash outflow invested in a project. In other words it is the minimum required number of years to recover the original cash outlay invested in a project. The cash flow after taxes is used to compute pay back period.

Pay back period can be calculated in two ways, (i) Using formula (ii) Using Cumulative cash flow method. The first method can be applied when the cash flows stream of each year is equal/ annuity in all the years' or projects life, i.e., uniform cash flows for all the years. In this situation the following formula is used to calculate pay back period.

Pay Back Period = Original Investment ÷ Constant Annual Cash Flows After Taxes

or

Initial investment (cash outlay)

$$\text{Pay back period} = \frac{\text{Initial investment (cash outlay)}}{\text{Annual cash inflow}}$$

Caution The Second method is applied when, the cash flows after taxes are unequal or not uniform over the projects' life period. In this situation, pay back period is calculated through the process of cumulative cash flows, cumulative process goes up to the period where cumulative cash flows equals to the actual cash outflows. Put it simple:

PBP = Year before full recovery+(Unrecovered Amount of Investment ¸ Cash flows during the year)

Accept-Reject Rule

Acceptance or rejection of the project is based on the comparison of calculated PBP with the maximum or standard pay back period. Put it simple

Accept: Cal PBP < Standard PBP

Reject: Cal PBP > Standard PBP

Considered: Cal PBP = Standard PBP

Notes

Accept-reject role for mutually exclusive projects

These kinds of Proposals are those proposals which represent alternative methods of doing the same job. In case one proposal is accepted, the need to accept the other is ruled out. For Example, there are 5 pieces of equipment available in the market to carry out a job. If the management chooses one piece of the equipment, others will not be required because they are mutually exclusive projects.

Notes

Advantages Pay Back Period

The Merits of pay back period are,

1. It is very simple and easy to understand.
2. Cost involvement in calculating pay back period is very less as compared to sophisticated methods.

Limitations of Pay Back Period

Pay back period method suffers from certain Limitations such as:

It ignores cash flows after pay back period.

1. It is not an appropriate method of measuring the profitability of an investment, as it does not consider all cash inflows yielded by the investment.
2. It does not take into consideration time value of money.
3. There is no rationale basis for setting a minimum pay back period.
4. It is not consistent with the objective of maximizing shareholders' wealth. Share value does not depend on pay back periods of investment projects.

Note For calculating payback period we need cash flows after taxes (CFAT)

Calculation of Cash flows after taxes (CFAT):

Particulars	Rs.
Sales revenue Less: Variable cost	xxx xxx
Contribution Less: Fixed cost	*xxx* *xxx*
Earning Before Depreciation and Taxes (EBDT) Less: Depreciation	xxx xxx
Earning Before Taxes (EBT) Less: Taxes	xxx xxx
Earnings After Tax (EAT) Add: Depreciation	xxx xxx
Cash Flows After Tax (CFAT) or **Earnings After Taxes but Before Depreciation (EATBD)**	xxx

Illustration 1: A project requires an initial investment of ₹ 1,20,000 and yields annual cash inflow of ₹ 12,000 for 12 years. Find the payback period.

Solution:

1,20,000/12,000 = 10 years.

In case of unequal annual cash inflows, cumulative cash inflows will be calculated and by interpolation, the exact payback period can be found out.

Illustration 2: The project requires an initial investment of ₹ 20,000 and the annual cash inflows for 5 years is ₹ 6,000, ₹ 8,000, ₹ 5,000, ₹ 4,000 and ₹ 4,000 respectively. Find the payback period.

Notes

Solution:

Year	Cash inflow	Cumulative Cash Inflow
1	Rs. 6,000	Rs. 6000
2	Rs. 8,000	Rs. 14,000
3	Rs. 5,000	Rs. 19,000
4	Rs. 4,000	Rs. 23,000
5	Rs. 4,000	Rs. 27,000

The above table shows that in 3 years, ₹ 19,000 has been recovered, ₹ 1000 is left out of initial investment. In the fourth year, the cash inflow is ₹ 4000. It means the payback period is between three and four years, ascertained as follows:

$$\text{Pay} - \text{back period} = 3 \text{ years} + \frac{1000}{4000} = 3.25 \text{ years}$$

Accept or Reject Criterion

The decision to accept or reject a proposal depends upon how the computed pay-back figures compares with a standard. For example, if the pay-back standard were 7 years, the project with the 5 years pay-back period would be accepted. Therefore, the decision rule is accepted if the computed pay-back period is less than the standard ; other wise it is rejected.

Illustration 3: A company is considering expanding its production. It can go either for an automatic machine costing ₹ 2,24,000 with an estimated life of 5 years or an ordinary machine costing ₹60,000 having an estimated life of 8 years. The annual sales and costs are estimated as follows:

	Automatic Machine (₹)	Ordinary Machine (₹)
Sales	1, 50,000	1, 50,000
Costs:		
Materials	50,000	50,000
Labour	12,000	60,000
Variable overheads	24,000	20,000

Calculate the payback period and advice the management.

Solution:

Calculation of PBP needs cash flows after tax. Hence, now calculate CFAT

Calculation of Cash inflows after taxes CFAT

Calculation of Cash inflows after taxes CFAT

Particulars	Automatic Machine (₹)	Ordinary Machine (₹)
Sales	1, 50,000	1, 50,000
Less costs:		
Material + Labour + V. overheads	86,000	1, 30,000
EBDT	**64,000**	**20,000**
Less: Depreciation (WNi)	44,800	7,500
EBT	**19,200**	**12,500**
Less: Taxes at 50 per cent	9,600	6,250
EAT	**9,600**	**6,250**
Add: depreciation	44,800	7,500
Cash inflow (CFAT)	**54,400**	**13,750**

Notes

Payback period = Initial Investment ÷ Constant Annual Cash Inflows

PBP of Automatic Machine = 2,24,000 ÷ 54,400 = 4.11 Years

PBP of Ordinary Machine = 60,000 ÷ 13,750 = 4.36 Years

Advice: The payback period in case of automatic machine is shorter. Hence automatic machine is preferable.

Working Note: Depreciation = (Original Investment – Scrap Value) ÷ Life Period

Automatic Machine: (2, 24,000 – 0)/5 = ₹ 44,800

Old Machine: (60,000 – 0)/8 = ₹ 7,500

Assumption: Tax rate assumed as 50 per cent

Illustration 4: A project costs ₹20 lakh and yields annually a profit of ₹3, 00,000 after depreciation at 12½ per cent but before tax at 50 per cent. Calculate payback period and suggest whether it should be accepted or rejected based on 6 year standard pay back period.

Solution:

Calculation of Cash Flows After Tax

Particulars	Amount (₹)
Profit After Depreciation before Taxes	**3,00,000**
Less: Taxes at 50%	1,50,000
EAT	**1,50,000**
Add: Depreciation (Note)	2,50,000
Cash inflow (CFAT)	4,00,000

Payback period = Initial Investment ÷ Constant Annual Cash Inflows

Payback period = ₹20,00,000 ÷ ₹4,00,000 = 5 years

Decision: Project should be accepted since calculated PBP is less than the standard PBP

Working Note: Depreciation = Cost of Project × Depreciation Rate

= 20,00,000 × 0.125 = ₹2,50,000

Accounting Rate of Return/Average Rate of Return (ARR)

Accounting rate of return method uses accounting information as revealed by financial statements, to measure the profitability of the investment proposals. It is also known as the return on investment (ROI). Some times it is known as average rate of return (ARR). Average annual earnings after depreciation and taxes are used to calculate ARR. It is measured in terms of percentage. ARR can be calculated in two ways.

1. Whenever it is clearly mentioned to calculate accounting rate of return.

   If accounting rate of return is given in the problem, return on original investment method should be used to calculate accounting rate of return.

   $$\text{Accounting Rate of Return (ARR)} = \frac{\text{Average annual EAT or PAT}}{\text{Original investment (OI)*}} \times 100$$

   * OI = Original investment + Additional NWC + Installation Charges + Transportation Charge

Notes

2. Whenever it is clearly mentioned as average rate of return

   If Average rate of return is given in the Illustration, return on average investment method should be used to calculate average rate of return.

   $$\text{Average Rate of Return} = \frac{\text{Average annual EAT}}{\text{Average investment (AI)*}} \times 100$$

   * AI = (Original investment – scrap)1/2 + Additional NWC + Scrap value

Did u know? **What will be the accounting treatment if ARR is given in problem?**

If ARR is given in the problem, any one of the above method can be used to calculate ARR (preferably return on average investment method).

Accept-Reject Rule

Acceptance or rejection of the project is based on the comparison of calculated ARR with the predetermined rate or cut of rate.

Accept: Cal ARR > Predetermined ARR or Cut-off rate

Reject: Cal ARR < Predetermined ARR or Cut-off rate

Considered: Cal ARR = Predetermined ARR or Cut-off rate

Advantages of ARR Method

The ARR method has some *merits.*

1. The most significant merit of ARR is that, it is very simple to understand and easy to calculate.
2. Information can easily be drawn from accounting records.
3. It takes into account all profits of the projects' life period.
4. Cost involvement in calculating pay back period is very less in comparison to the sophisticated methods, since it saves analysts' time.

Limitations of ARR Method

ARR method suffers form serious demerits.

1. It uses accounting profits instead of actual cash flows after taxes, in evaluating the projects. Accounting profits are inappropriate for evaluating and accepting projects, since they are computed based on arbitrary assumptions and choices and also include non-cash items.
2. It ignores the concept of time value of money.
3. It does not allow profits to be reinvested.
4. It does not differentiate between the size of the investment required for each project.

Notes

Illustration 5: The working result of two machines are given below

	Machine X ₹	Machine Y ₹
Cost	45,000	45,000
Sales per year	1,00,000	80,000
Total Cost Per Year (excluding depreciation)	36,000	30,000
Expected Life	2 years	3 years

Which of the two should be preferred?

Solution:

Computation of average income

	Machine X ₹	Machine Y ₹
Sales per year	1,00,000	80,000
Less: cost per year	36,000	30,000
	64,000	50,000
Less: Depreciation	22,500	15,000
Net profit	41,500	35,000
Average Income	41,500	35,000
Average Investment	22,500	22,500

$$ARR = \frac{\text{Average Income}}{\text{Average investment}} \times 100$$

$$\text{For } 'X' \frac{41,500}{22,500} \times 100 = 184\%$$

$$\text{For } 'Y' = \frac{35,000}{22,500} \times 100 = 156\%$$

Machine X has higher ARR. Hence, Machine X should be preferred.

Working Notes:

Calculation of Depreciation

Depreciation = Original Cost – Scrap value / life of assets in years

For Machine X

Depreciation = ₹ 45000-0/2 year = ₹ 22500

For Machine Y

Depreciation = ₹ 45000 -0/3 years = ₹ 15000

Illustration 6: A limited firm has under consideration the following two projects. Their details are as follows:

	Project X ₹	Project Y ₹
Investment in machinery	10,00,000	15,00,000
Working capital	5,00,000	5,00,000
Life of machinery (Years)	4	6
Scrap value of machinery (%)	10	10
Tax rate (%)	50	50

Notes

Income before depreciation and tax at the end of

Year	1	2	3	4	5	6
X (₹)	8,00,000	8,00,000	8,00,000	8,00,000	--	----
Y (₹)	15,00,000	9,00,000	15,00,000	8,00,000	6,00,000	3,00,000

You are required to calculate the average rate of return and suggest which project is to be preferred.

Solution:

Calculation of ARR: (Average annual income after taxes ÷ Average investment) × 100

Project X = (2,87,500/10,50,000) × 100 = 27.38 per cent

Project Y = (3,54,167/13,25,000) × 100 = 26.73 per cent

ARR of Project X is higher than that of Project Y. Hence Project X is preferred.

Working Notes:

1. Calculation of Average Annual Income After Depreciation and Taxes:

	Project X ₹	**Project Y ₹**
Average EBDT	8,00,000	9,33,333
Less: Depreciation	2,25,000	2,25,000
Average EBT	5,75,000	7,08,333
Less: Taxes at 50 %	2,87,500	3,54,166
Average EAT	2,87,500	3,54,167

2. Calculation of Average Investment

   (Original investment – scrap value)1/2 + Additional Working Capital + Scrap value

   Project X: (10,00,000 – 1,00,000) 1/2 + 5,00,000 + 1,00,000 = ₹10,50,000

   Project Y: (15,00,000 – 1,50,000) 1/2 + 5,00,000 + 1,50,000 = ₹13,25,000

3. Depreciation: (Original Investment – Scrap Value) ÷ Life Period

   Project X: (10,00,000 – 1,00,000)/4 = ₹ 2,25,000

   Project Y: (15,00,000 – 1,50,000)/6 = ₹ 2,25,000

4. Average EBDT = 32,00,000/4 = 8,00,000 56,00,000/6 = 9,33,333

7.3.2 Modern Techniques or Discounted Cash Flow (DCF) Techniques

Modern/discounted cash flow techniques take into consideration almost all the deficiencies of the traditional methods and consider all benefits and cost occurring during the projects' entire life period. Modern techniques can be again subdivided into three, viz., (A) Net Present Value (NPV) (B) Internal Rate of Return (IRR) or trail and error (C) Profitability Index (PI) or Discounted Benefit Cost Ratio (DBCR).

Notes

Net Present Value Method (NPV)

The net present value method is one of the discounted cash flow methods. It is also known as discounted benefit cost ratio method. NPV can be defined as preset value of benefits minus preset value of costs. It is the process of calculating present values of cash inflows using cost of capital as an appropriate rate of discount and subtract present value of cash outflows from the present value of cash inflows and find the net present value, which may be positive or negative. Positive net present value occurs when the present value of cash inflow is higher than the present value of cash outflows and vice versa.

Formula

NPV = PV of Cash inflow – Pv of cash flow

Notes **Steps involved in computation of NPV**

1. Forecasting of cash inflows of the investment project based on realistic assumptions.
2. Computation of cost of capital, which is used as discounting factor for conversion of future cash inflows into present values.
3. Calculation of cash flows using cost of capital as discounting rate/factor.
4. Finding out NPV by subtracting present value of cash outflows from present value of cash inflows.

Accept-Reject Rule

Acceptance or reject rule of the project is decided based on the NPV.

Accept: NPV> Zero

Reject: NPV< Zero

Consider: NPV= Zero

Advantages of NPV Method

The ***Merits*** of NPV are

1. It takes into account the time value of money.
2. It uses all cash inflows occurring over the entire life period of the project including scrap value of the old project.
3. It is particularly useful for the selection of mutually exclusive projects.
4. It takes into consideration the changing discount rate.
5. It is consistent with the objective of maximization of shareholders' wealth.

Limitations of NPV Method:

NPV is the most acceptable method in comparison with traditional methods. Nevertheless, it has certain ***Limitations*** also.

1. It is difficult to understand when compared with PBP and ARR.

Notes

2. Calculation of required rate or discounting factor or cost of capital is difficult, which involves a lengthy and time consuming process and presents illustrations. At the same time calculation cost of capital is based on different methods.

3. In case of projects involving different cash outlays, NPV method may not give dependable results.

Illustration 7: A choice is to be made between the two competing proposals which require an equal investment of ₹ 50000 and are expected to generate net cash flows as under:

Years	Project A (₹)	Project B (₹)
1	25000	10000
2	15000	12000
3	10000	18000
4	Nil	25000
5	12000	8000
6	6000	4000

Cost of capital of the company is 10%. The following are the present value factor at 10% p.a.

Year	:	1	2	3	4	5	6
P.V. Factor At 10%	:	0.909	0.826	0.751	0.683	0.621	0.564

Which proposal should be selected using NPV method? Suggest the best project.

Solution:

Comparative Statement of NPV

Year	PV Factor @10%	Project A		Project B	
		Cash Inflow	Present Value	Cash Inflow	Present Value
1	0.909	25000	22725	10000	9090
2	0.826	15000	12390	12000	9912
3	0.751	10000	7510	18000	13518
4	0.683	Nil	Nil	25000	17075
5	0.621	12000	7452	8000	4968
6	0.564	6000	3384	4000	2256
		Total present Value :	**53461**		**56819**
		Less : Initial Investment :	**50000**		**5000**
		NPV :	**Rs. 3461**		**Rs. 6819**

Since project B has the highest NPV, Project B should be selected.

Illustration 8: The Gama Co., Ltd., is considering the purchase of a new machine. Two alternative machines (X and Y have been suggested, each having an initial cost of ₹ 400000 and requiring ₹ 20000 as additional working capital at the end of the 1st year. Earnings after taxation are expected to be as follows:

Year	Cash inflows	
	Machine X ₹	Machine Y ₹
1	40000	120000
2	120000	160000
3	160000	200000
4	240000	120000
5	160000	80000

Notes

The company has a target of return on capital of 10% and on this, you are required to compare the profitability of the machines and state which alternative you consider financially preferable.

Note: The present value of ₹ 1 due in 'n' number of years:

Year	:	1	2	3	4	5
P.V. At 10%	:	0.91	0.83	0.75	0.68	0.62

Solution:

Statement showing the profitability of the two machines

Year	PV Factor @10%	Machine X		Machine Y	
		Cash Inflow	Present Value	Cash Inflow	Present Value
1	0.91	40000	36400	120000	109200
2	0.83	120000	99600	160000	132800
3	0.75	160000	120000	200000	150000
4	0.68	240000	163200	120000	81600
5	0.62	160000	99,200	80000	49600
Total present value of cash inflows :			**518400**		**523200**
Total present value of cash outflows :					
(Rs. 400000 + 20000 x 0.91) :			**418200**		**418200**
Net Present value :			**100200**		**105000**

Recommendation: Machine Y is preferable to machine X

Accept or Reject criterion

In case, NPV is positive, the project should be accepted. If the NPV is negative, the project should be rejected.

It can be summarized as under:

1. NPV> Zero → Accept
2. NPV< Zero → Reject
3. NPV = Zero → Consider

Task A new machine costs ₹ 20,000, requires no increased investment in working capital and is expected to yield ₹6, 000 profit per year for 10 years, at which time its scrap v-alue will be negligible. Assume straight-line depreciation and a 30 per cent tax rate.

If management requires at least a 10 per cent return on any new investment, would this investment qualify? At a rate of return what is the present value per rupee of investments.

Internal Rate of Return (IRR)

This method advocated by Joel Dean, takes into account the magnitude and timing of cash flows.

IRR is that rate at which the sum of Discounted Cash Inflow (DCF) equals the sum of discounted cash outflow. It is the rate at which the net present value of the investment is zero. It is called Internal Rate of Return because it depends mainly on the outlay and proceeds associated with the project and not on any rate determined outside the investment.

Notes

Did u know? This method is also known by following names:

1. Marginal efficiency of capital
2. Rate of return over cost
3. Time adjusted rate of return
4. Yield on investment

Computation of IRR is based on the cash flows after taxes. IRR is mathematically represented as 'r'. It can be found by trial and error method. In this method the evaluator selects any discount rate to compute present value of cash inflows. Generally the cost of capital is taken as first trial. If calculated present value of the cash inflows is higher than the present value cash outflows then evaluator has to try at higher rate. On the other hand if the present value of cash inflows is lower than the present value of cash outflows then evaluator has to try lower discounting factor. This process will be repeated till the present value of cash inflows equals to the present value of cash outflows.

Generally, IRR may lie between two discounting factors; in that case analyst has to use interpolation formula for calculation of IRR. The formula is as follows:

$$IRR = LDF\% + \left[\Delta\, DF \frac{LDPV - OI}{LDPV - HDPV} \right]$$

Where, LDF = Discount factor of low trial

ΔDF = Difference between low discounting factor and High discounting factor

LDPV = PV of cash inflows at low discounting factor trial

HDPV = PV of cash inflows at high discounting factor trial

OI = Original investment

Or

$$IRR = A + \frac{C - 0}{C - D} \times (B - A)$$

Where,

A = Discounted factor of low trial

B = Discounted factor of high trial

C = Present value of cash inflow in the low trial

D = Present value of cash inflow in the high trial

O = Original or initial outlay

Accept-Reject Rule

Acceptance or reject rule of the project decides based upon the calculated IRR and Cost of capital (Ko).

Accepted: IRR > Cost of capital (Ko)

Reject: IRR < Cost of capital (Ko)

Consider: IRR = Cost of capital (Ko)

Notes

Merits of IRR

1. IRR attempts to find the maximum rate of interest at which funds invested in the project could be repaid out of the cash inflows arising from that project.
2. It considers the time value of money.
3. It considers cash flows thought out the life of the project.
4. It is not in conflict with the concept of maximizing the welfare of the equity shareholders.
5. It is calculated by the method of trial and error, usually it gives more psychological satisfaction to the user.
6. It is consistent with the objective of shareholders; wealth maximization.

Demerits of IRR

1. Calculation of IRR is quite tedious and it is difficult to understand.
2. Both NPV and IRR assume that the cash inflows can be reinvested at the discounting rate in the new project. However, reinvestment of funds at the cut-off rate is more appropriate than at the IRR. Hence, NPV method is more reliable than IRR to ranking two or more projects.
3. It implies that profits can be reinvested at internal rate of return, which is not logical.
4. It produces multiple rate of returns which can be confusing.
5. It does not help in the evaluation of mutually exclusive projects, since a project with highest IRR would be selected. However, in practice, it may not turn out to be the one, that is the most profitable and consistent with the objective of shareholders i.e. wealth maximization.
6. It may not give fruitful results in case of unequal projects life, unequal cash outflows, and difference in the timing of cash flows.

Note **Comparison of NPV and IRR Methods**

NPV Method	IRR Method
1. Interest rate is a known factor	1. Interest rate is an unknown factor
2. It involves computation of the amount that can be invested in a given project so that the anticipated earnings will be sufficient to repay this amount with market rate of interest.	2. It attempts to find out the maximum rate of interest at which funds are invested in the project. Earnings from the project in the form of cash flow will help us to get back the funds already invested.
3.It assumes that the cash inflows can be reinvested at the discounting rate in the new projects.	3. It also assumes that the cash inflows can be reinvested at the discounting rate in the new projects.
4. Reinvestment is assumed to be at the cut-off rate.	4. Reinvestment in funds is assumed to be at the IRR.

Notes

Profitability Index (PI)/Discounted Benefit Cost Ratio (DBCR)

This is another discounted cash flow method of evaluating investment proposals. It is also known as discounted benefit cost ratio method. It is similar to NPV method. It is the ratio of the present value of cash inflows, at the required rate of return, to the initial cash outflow of the investment proposal. PI method measures the present value of future cash per rupee, where as NPV is based on the difference between present value of cash inflows and present value of cash outflows. NPV method is not reliable to evaluate projects requiring unequal initial investments. PI method provides solution to this problem. PI is the ratio, which is derived by dividing present value of cash inflows by present value of cash outflows.

Pl is the ratio of present value of future cash benefits at the required rate of return at the initial cash outflow of the investment.

$$PI = \frac{\text{PV of cash inflows}}{\text{Initial cash outlay}}$$

Like IRR and NPV methods, profitability index is a conceptually sound method of appraising investment projects. It provides ready comparisons between investment proposals of different magnitudes.

Accept-Reject Rule

Accept: PI > 1 ***Reject:*** PI < 1 ***Considered:*** PI = 1

Merits of PI

The PI Method satisfies almost all the requirements of a sound investment criterion. The characteristic, as we recollect are:

1. It gives due consideration to time value of money.
2. It considers all cash flows to determine PI.
3. It help to rank projects according to their PI.
4. It recognizes the fact that bigger cash flows are better than smaller ones and early cash flows are preferable to later ones.
5. It can also be used to choose mutually exclusive projects by calculating the incremental benefit cost ratio.
6. It is consistent with the objectives maximization of shareholders' wealth.

Illustration 9: The initial cash outlay of a project is ₹ 50000 and it generates cash inflows of ₹ 10000, ₹ 20000, ₹ 30000 and ₹ 10000. Assume 10% rate of discount. Find Pl.

Solution:

Computation of PI

Year 1	Cash inflow 2	Present Value Factor @ 10%	Present Value of Cash inflow
1	10000	0.909	9090
2	20000	0.826	16520
3	30000	0.751	22530
4	10000	0.683	6830
		Total	**54970**

Notes

$$PI = \frac{\text{PV of cash inflows}}{\text{Initial cash outlay}}$$

$$= 54970/50000 = 1.0994$$

Accept or reject criterion

Accept the project if its profitability index is greater than one. Such a project will have the positive net present value. Projects can be ranked on the basis of PI. Highest rank will be assigned to the project with highest PI, while the lowest rank will be given to the project having lowest PI.

Illustration 10: A project requires an investment of ₹10,000 and the expected cash flows are: 1st year ₹12,000; and 2nd year ₹4,000

The cost of capital is 10 per cent and the PV factors at 10 per cent are 1st year-0.909, 2nd year-0.826. Compute the profitability index.

Solution:

Profitability index = Total PV of cash inflows ÷ Initial investment

= (₹12,000 × 0.909 + ₹4,000 X 0.826) ÷ 10,000

= 14,212 ÷ 10,000 = 1.42

It indicates that for every one rupee investment, there is (1.42-1) 0.42 paise profit.

Case Study

RNS Motors Ltd.

RNS Adwani, an ITI diploma holder had been working with M/s. RNS and workshop for the last ten years. He had joined as a technician. He was recognized as the best mechanic of Supreme Garage. A good number of clients preferred to get their cars repaired by RNS Adwani . In three years time, he was promoted as a supervisor. RNS Adwani then joined distance education programme of IGNOU and completed his graduation. He studied accounts and would assist the owner Mr. Gupta in maintaining the accounts. Mr. Gupta liked him very much and two years back, RNS Adwani was promoted as the manager of RNS and Workshop.

Gupta had set up this business about 18 years back when he had retired from the Indian Army due to a leg injury. Due to good customer relations and quality service, RNS and workshop had earned a very good reputation and was known as the best motor garage in the district. A large number of clients form the neighbouring district would bring in their vehicles to Supreme Garage. The workshop was known for engine overhauling. It had an electrical section for auto electrical and an agency for Exide batteries. RNS specialized in denting and painting and maintained good relations with insurance companies. It maintained its own tow truck and did good business during accidents and break-downs. It presently employed ten full time mechanics, one supervisor besides RNS Adwani and Gupta who were manager and the owner respectively. During the rush season the workers worked overtime and additional casual labour was also employed to meet the delivery schedules.

Contd...

Notes

Since past one year, Mrs. Gupta was not keeping well. Six months ago, she had a minor heart attack. Mrs and Mr. Gupta decided to shift to USA and join their daughter, who was a heart specialist at Los Angles, USA. Gupta had no one to succeed him, he decided to sell the business. He wanted the buyer to run the business on similar lines and maintain its reputation.

He called RNS Adwani and made him an offer to sell his business. The initial offer was for ₹ 57.50 lakh. He also proposed to assist RNS in financing the purchase.

Gupta provided him with the information on past earnings with projections for five years. He also provided him with the Balance Sheet and Profit and Loss Accounts of RNS Motors as on 31st March 2000. He informed RNS that based upon the business flow, he had valued the goodwill as ₹ 15 lakh.

RNS was excited about the offer. He knew that the business was very profitable and its profits had been increasing over the years. It had never been at loss. He consulted a friend who was a banker and also a Chartered Accountant. He advised him differently. He knew there was a scope of negotiation over the price of the business. Now RNS now needs assistance.

Sales and Profit of Previous Years

Net sales	81,95,000	90,34,000
PBT	7,37,500	7,56,600
PAT	5,25,000	6,23,200

Summary of Projected sales and earnings

Year	2001	2002	2003	2004	2005
Net Sales	11,00,000	120,00,000	125,00,000	130,00,000	135,00,000
PBT	8,65,000	9,50,000	10,50,000	12,00,000	12,50,000
PAT	7,00,000	7,80,000	8,60,000	9,30,000	9,75,000

Questions

1. Evaluate the value of RNS Motors using discounted cash flow and multiple earning method (Assume 20% required rate of return).
2. How do you think the banker will value this business? Discuss the method and calculate the value.
3. If you were the banker, will you finance?
4. How would you evaluate the good will of RNS Motors.
5. As a consultant would you advice Mr. RNS Adwani to buy RNS Motors or not. Explain with reasons.

Contd...

Notes

ANNEXURE 1

RNS MOTORS
Balance sheet (As on 31.03.2000)

Liabilities	Rs.
Capital	16,00,000
Retained profits	18,10,880
Building loan	26,99,200
Term loan	12,16,000
Current liabilities	8,14,400
Total liabilities	81,40,480
Assets	
Gross block	66,56,000
Depreciation	14,22,720
Net blocks (at the end)	52,33,280
Current assets	
Stocks	6,65,600
Receivables	13,31,200
Cash in hand	9,10,400
Total current assets	29,07,200
Total assets	81,40,440

Depreciation Schedule

Asset	Gross Block	Depreciation	Net Block
Land Building	38,40,000	6,16,000	32,24,000
Plant Eqpt.	26,24,000	7,34,720	18,89,280
Other Assets	1,92,000	72,000	1,20,000
Total	66,56,000	14,22,726	55,33,280

RNS MOTORS
Profit & Loss Account (for the year ending 31.03.2000)

	Rs.
Net Sales	99,64,800
Direct Wages	30,78,400
Contract Materials	18,83,200
Supplies	2,36,800
Mix Costs	4,24,000
Cost of Sales	56,22,400
Gross Profit from Operation	43,42,400
Operating Expenses	26,35,200
Total Depreciation for the Year	3,76,272
Net Income before Interest and Taxes	13,30,928
Interest	4,97,440
Profit Before tax	8,33,488
Income tax	1,58,240
Net Profit after tax	6,75,248

Notes

7.4 Summary

- Modern financial manager's function is efficient allocation of capital among available investment opportunities. The investment opportunity may be long-term investment or fixed assets; short–term or current assets.
- One of the important problems confronting the top management of a firm is to determine whether the firm should invest funds in fixed assets. Fixed assets may be tangible as well as intangible. While the former represent assets like land and buildings, plant and machinery and, furniture and fixtures, the latter group consists of copyrights, patents and goodwill.
- Capital budgeting is the firm's decision to invest its current funds most efficiently in the long-term assets in anticipation of an expected flow of benefits over a series of years.
- Capital budgeting decisions are important since growth of the firm depends on fixed assets, it is a more risky decision as huge investments are involved, an irreversible decision, it has effect on other projects too, a and difficult decision (became the decision is based on future years cash inflows, and involves uncertainty of future and hence more risk).
- Capital budgeting decisions are very important, but they pose difficulties, which shoot form three principle sources: measurement problem, uncertainty, and temporal spread.
- The capital budgeting process may be more or less depended on the type of the project. So firm normally classify the projects into different categories. It may differ from one firm to another firm, but the most important classification of projects are: new projects, expansion projects, diversification projects, replacement and modernization projects, research and development projects, interior decoration, recreational facilities, executive aircrafts, landscaped gardens etc.
- A wide range of criteria has been suggested to judge the worthwhileness of investment projects. They are divided into two broad categories, viz., (I) Traditional techniques or non-discounted techniques and (II) Modern techniques or discounted cash flow techniques. The traditional techniques are further subdivided into two, such as (a) Pay back period, and (b) Accounting rate of return or average rate of return (ARR). The discounted cash flow techniques are again subdivided into three, such as (A) Net present value (NPV) technique, (B) Internal rate of return (IRR) or trial and error technique, and (C) Profitability Index (PI) of Benefit Cost Ratio (BCR).

7.5 Keywords

Capital Budgeting: It refers to planning and deployment of available capital for the purpose of maximizing long-term profitability of the firm.

Contingent Investment Proposals: There are certain projects which are contingent upon the acceptance of others.

Mutually Exclusive Investment Proposals: Those proposals which represent alternative methods of doing the same job.

Replacement Investment: The investments, which are contemplated for replacing, old and antiquated equipment so that the job could be performed more efficiently, are termed as replacement investment.

Notes

7.6 Self Assessment

Fill in the blanks:

1. Fixed assets represent ..... and ..... elements.
2. ..... is the firm's decision to invest its current funds most efficiently in the long-term assets in anticipation of an expected flow of benefits over a series of years.
3. Capital budgeting decisions are ..... without ..... .
4. Capital budgeting evaluation techniques are divided into ..... broad categories.
5. Traditional techniques of capital budgeting evaluation is also known as ..... .
6. Pay back period and Accounting rate of return methods are ..... .
7. Modern techniques are also known as ..... .
8. Discounted cash flow techniques are subdivided into ..... .
9. Net present value (NPV), ..., and profitability index are three discounted cash flow techniques.
10. Profitability index technique is also known as ..... .

State whether the following statements are true or false:

11. Capital budgeting is a short-term decision.
12. CFAT is the base for computation of pay back period.
13. When cash flows after taxes are unequal then cumulative cash flow method is used to compute pay back period.
14. Intermediate cash flows are reinvested at the rate of IRR is the assumption of IRR.
15. Additional working capital required is not added to the cost of the project when evaluation is based on DCF techniques.
16. Additional, scrap value and cost of project are the components of average investment.
17. NPV and IRR both, are DCF methods.
18. If there is a size disparity the NPV and IRR will give different rankings.

7.7 Review Questions

1. A project requires an investment of ₹100,000. It is expected t yield an annual cash flow after taxes of ₹ 20,000 for 10 years. Calculate payback period.
2. ABC company is planning to buy an equipment, that had two alternatives A and B. Each equipment requires an initial investment of ₹ 30,000. From the following additional information you are required to calculate payback period and suggest which equipment should be preferred? why?

Years		1	2	3	4	5
CFAT	A(₹)	10,500	8,000	6,000	7,500	12,000
	B(₹)	3,000	6,000	8,000	12,000	80,000

3. An equipment costs ₹ 10,00,000 and it is expected to yield a profit after depreciation but before loss is ₹ 150,000. Depreciation rate is 10 per cent on straight-line method, and company's tax rate is 50 per cent, calculate the pay back period.

Notes

4. A project expected cash flows are as follows:

Year	0	1	2	3	4	5
CFAT (₹)	50,000	10,000	15,000	20,000	25,000	20,000

Calculate pay back period.

5. A project costs ₹30, 00,000 and yields annually ₹4, 50,000 after depreciation at 15 per cent but before tax at 40 per cent. Calculate payback period.

6. From the following information calculate pay back period and Accounting Rate of Return

Projects	Original Investment	CFAT(Rs)	Economic life
A	25,000	3,000	10
B	3,000	1,000	5
C	12,000	2,000	8
D	20,000	4,000	10
E	40,000	8,000	2

7. A company is planning to consider any one of the three alternatives A, B and C. Calculate ARR.

Alternatives	CFAT(Rs)		
	0	1	2
A	5,000	0	6,610
B	5,000	1,080	3,080
C	5,000	5,750	0

8. From the following cash flow (CFAT) stream of X and Y, calculate (a) PBP (b) ARR (c) NPV, and (d) PI.

Years	0	1	2	3	4	5	6	7	8	9	10
X (Rs. in Lakhs)	4	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80
Y (Rs. in Lakhs)	6	0.80	0.80	0.80	0.80	0.80	0.60	0.70	0.30	0.30	0.40

Assume 10 per cent discounting rate.

9. VS International co, Ltd, is evaluating a project that costs ₹ 2,00,000 and it require an all additional net working capital of ₹ 1,00,000. It is expected to generate a net cash flow of ₹ 1,05,000 for 5 years. What is the NPV and IRR of the project assuming 50 per cent tax rate and 10 per cent cash of capital. [Answer: NPV: ₹, 160.155, IRR: 29.86 per cent]

10. XYZ company is considering the following projects P and Q.

Year	0	1	2	3
P	25,000	5,000	5,000	25,640
Q	28,000	12,672	12,672	12,602

Calculate NPV and IRR of both projects. [Answer: NPV:P–Rs.1700, Q–Rs.2436, IRR:P–15 per cent, Q–17 per cent]

11. What is capital budgeting? The process and techniques of capital budgeting.

12. Briefly discuss the techniques of capital budgeting with their merits and limitations.

13. What is capital budgeting? Discuss its nature, importance and deficiencies of capital budgeting.

Notes

Answers: Self Assessment

1.	Non-liquid, long-term	2.	Capital budgeting
3.	Irreversible, loss	4.	Two
5.	Non-discounted	6.	Traditional
7.	Discounted cash flow techniques	8.	Three
9.	Internal Rate of Return (IRR)	10.	Benefit cost ratio
11.	False	12.	True
13.	True	14.	True
15.	False	16.	True
17.	True	18.	True

7.8 Further Readings

Books

Chandra, P., *Financial Management - Theory and Practice*, New Delhi, Tata McGraw Hill Publishing Company Ltd., 2002, p. 3.

Sudhindra Bhat, *Financial Management*, New Delhi, Excel Books, 2008.

Van Horne, J.C. and Wachowicz, Jr, J.M., *Fundamentals of Financial Management*, New Delhi, Prentice Hall of India Pvt. Ltd., 1996, p. 2.

Online link

http://www.fei.org/

Notes

Unit 8: Working Capital Management

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Objectives

After studying this unit, you will be able to:

- Discuss concept and significance of working capital
- Explain determining working capital requirements

Introduction

Working capital management is significant in financial management due to the fact that it plays a vital role in keeping the wheel of the business running. Every business requires capital, without which it cannot be promoted. Investment decision is concerned with investment in current assets and fixed assets. There are two assets required to be financed by fixed capital and working capital. In other words, the required capital can be divided into two categories, such as fixed capital and working capital. *Fixed capital* required for establishment of a business, where as working capital required to utilize fixed assets. Fixed assets cannot be utilized without current assets. It is just like a blood in the human body, without which there is no body.

8.1 Concept and Significance of Working Capital

Working capital refers to short-term funds to meet operating expenses. It refers to the funds, which a company must possess to finance its day-to-day operations. It is concerned with the management of the firm's current assets and current liabilities. It relates with the problems that arise in attempting to manage the current assets, current liabilities and their inter-relationship that exists between them. If a firm cannot maintain a satisfactory level of working capital, it is likely to become insolvent and may even be forced into bankruptcy.

Notes

Caution The concept of working capital has been a matter of great controversy, among the financial wizards and they view it differently. There is no universally accepted definition of working capital. Broadly, there are two concepts of working capital commonly found in the existing literature of finance such as:

1. Gross Working Capital (Quantitative Concept), and
2. Net Working Capital (Qualitative Concept).

Both these concepts of working capital have operational significance. The two concepts are not to be regarded as mutually exclusive. Each has its relevance in specific situations from the management point of view.

Each concept of working capital has its own significance – the 'gross concept' emphasising the 'use' and the 'net concept' the 'source' – an integration of both these concepts is necessary in order to understand working capital management in the context of risk, return and uncertainty.

8.1.1 Gross Working Capital Concept

According to this concept, the total current assets are termed as the gross working capital or circulating capital. Total current assets include; cash, marketable securities, accounts receivables, inventory, prepaid expense, advance payment of tax; etc. This concept also called as 'quantitative or broader approach'. To quote Weston and Brigham, "Gross Working Capital refers to firm's investments in short term assets such as cash, short term securities, accounts receivables and inventories". The concept helps in making optimum investment in current assets and their financing. According to Walker, "Use of this concept is helpful in providing for the current amount of working capital at the right time so that the firm is able to realise the greatest return on investment". The supporters of this concept like Mead, Field, and Baker and Malott, argue that the management is very much concerned with the total current assets as they constitute the total funds available for operating process.

Significance

Gross Working Capital Concept focuses attention on the two aspects of current assets management, they are:

1. ***Optimum Investment in Current Assets:*** Investment in current assets must be just adequate to the needs of the firm. In other words, current assets investment should not be inadequate or excessive. Inadequate working capital can disturb production and can also threaten the solvency of the firm, if it fails to meet its current obligations. On the other hand, excessive investment in current assets should be avoided, since it impairs the firm's profitability.
2. ***Financing of Current Assets:*** Need for working capital arise due to the increasing level of business activity. Therefore, there is a need to provide/arrange it quickly. Similarly, some times surplus funds may arise, thus they should be invested in short-term securities. They should not be kept as idle.

8.1.2 Net Working Capital Concept

As per this concept, the excess of current assets over current liabilities represents net working capital. Similar view is expressed by Guthmann and Dougall, Gerstenberg, Goel, Park and Gladson, Kennedy and McMullen, and Myer in their distinguished works. 'Accounts Hand Book' has also fully supported this view. The famous economists like, Sailer, Lincoln, and Stevens, fully

supported this concept and viewed that the net working capital helps creditors and investors to judge the financial soundness of a firm.

Net Working Capital Concept represents the amount of the current assets, which would remain after all the current liabilities were paid. It may be either positive or negative. It will be positive, if current assets exceed the current liabilities and negative, if the current liabilities are in excess of current assets. Another alternative definition is that net working capital refers to that portion of firm's current assets, which financed with long-term funds.

Net Working Capital Concept indicates or measures the liquidity and also suggests the extent to which working capital needs may be financed by the permanent source of funds. To quote Roy Chowdary, "Net Working Capital indicates the liquidity of the business whilst gross working capital denotes the quantum of working capital with which business has to operate".

Net working capital = Current Assets – Current Liabilities

Significance

Net Working Capital Concept focuses attention on the two aspects of current assets management, they are: (i) Maintaining liquidity position, and (ii) To decide upon the extent of long-term capital in financing current assets.

1. ***Maintaining Liquidity Position:*** For maintaining liquidity position there is a need to maintain current assets sufficiently in excess of current liabilities. In other words, excess current assets helps in meeting its financial obligation within the operating cycle of the firm. Generally for every one rupee of current asset there will be one rupee of current liability. As discussed above, negative and excess working capitals both are bad to the firm.
2. ***To decide upon the Extent of Long-term Capital in Financing Current Assets:*** Net Working Capital (NWC) means the portion of current assets that should be financed by long-term funds. This concept helps to decide the extent of long-term funds required in finance current assets.

Example: If there are ₹ 1, 00,000 current assets and ₹ 75,000 current liabilities, the extent of current assets should be decided by the NWC base. The NWC is the difference between current assets and current liabilities. In the above example NWC is ₹ 25,000. This is the amount that is supposed to be financed by long-term funds.

Hence, NWC helps management to decide the extent to which current assets should be financed with equity capital and borrowed funds.

8.2 Operating Cycle and Cash Cycle

The continuing flow from cash to suppliers, to inventory, to accounts receivables and back into cash is what is called the operating cycle. The operating cycle involves the following procedure:

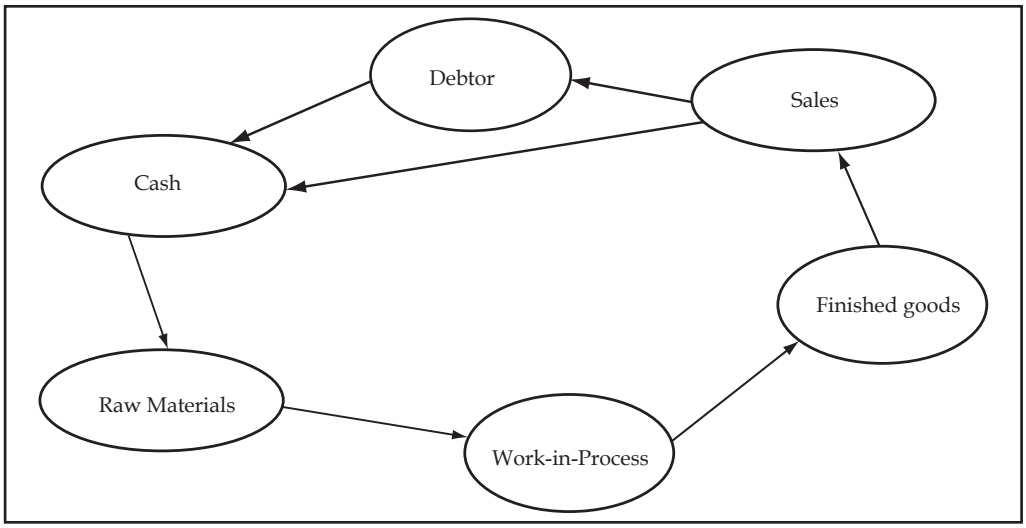
1. Conversion of cash into raw materials.
2. Conversion of raw materials into work-in-process.
3. Conversion of work-in-process into finished goods.
4. Conversion of finished goods into sales [debtors and cash].

   If firm sells good on cash basis with (d) operating cycle then returns to the operating cycle (a). But if, firm sells goods on credit basis then there will be another cycle that is,

5. Conversion of debtors into cash.

Notes

The following Figure shows the operating cycle.



Cash Conversion Cycle

The amount of time a firm's resources are tied up calculate by subtracting the average payment period from the operating cycle. In other words the time period between the dates from when pays it suppliers to the date till it receives the cash from its customers.

Calculation of Cash Conversion Cycle (CCC)

CCC = OC – APP

where, OC = Operating Cycle APP = Accounts Payable Period OC = AAI + ARP.

AAI = Average Age of Inventory ARP = Account Receivables Period.

From the financial statements, it can be determined as the constituents of Cash Conversion Cycle i.e., AAI, ACP, APP:

$$AAI = \frac{\text{Average Inventory}}{\text{Cos tofGoodss old}/365}$$

$$ARP = \frac{\text{Average Accounts Re ceivables}}{\text{Annual Sales}/365}$$

$$APP = \frac{\text{Averagae Accounts Payables}}{\text{Cos tofGoodsSold}/365}$$

8.3 Factors Affecting Working Capital Management

A business undertaking should plan its operations in such a way that it should have neither too much nor too little working capital. There are no set of rules or formulae to determine the working capital requirements of a firm. The total working capital requirement is determined by a wide variety of factors. A brief description of the general factors influencing the working capital needs of a firm is as follows:

1. ***Nature of Business:*** The amount of working capital is basically related to the nature of business. The proportion of current assets needed in some lines of business activity varies from other lines. For instance, trading and finance firms have a very small investment in

fixed assets, but they require more working capital. In contrast, public utility concerns rendering public services require huge investment in fixed assets.

2. ***Size of Business:*** It may be argued that a firm's size, measured in terms of assets or sales, affects need for working capital. Size may be measured in terms of a scale of operation. A firm having with large-scale operations will need more working capital required then a small firm having small-scale operations. A small firm may use extra current assets as a cushion against cash flow interruptions.

3. ***Production Cycle Process:*** This is another factor, which has bearing on the quantum of working capital, is the production cycle. The term production or manufacturing cycle refers to the time involved in the manufacturing of goods. It covers the time span between the procurement of raw materials and the completion of the manufacturing process leading to the production of finished goods. Longer the production cycle, the higher will be the working capital requirement and vice versa.

5. ***Credit Policy or Terms of Purchase and Sales:*** The credit policy relating to sales and purchases also affects the working capital. If a company purchases raw materials in cash and sells goods on credit, it will require larger amount of working capital. On the contrary, a concern having credit facilities for the purchase of raw materials and allowing no credit to its customers will require lesser amount of working capital.

6. ***Business Cycle:*** The amount of working capital requirements of a firm varies with every movement of business cycle. The variations in business conditions may be in two directions (a) *Upward phase* – when boom conditions prevail, in this case more working capital is required to cover the lag between the increased sales and receipt of cash as well as to finance purchase of additional material. (b) *Downswing phase* – in this case, the need for working capital will be very less, since there is no growth in sales.

8. ***Scarce Availability of Raw Materials:*** The availability of certain raw materials on a continuous basis without interruption would sometimes affect the working capital requirement. There may be some materials, which cannot be procured easily either because of either their sources are few or they are irregular. Therefore, the firm might be compelled to purchase more than required to manage smooth production. In this case, the amount of working capital required is large.

11. ***Dividend Policy:*** Dividend has a bearing on working capital, since it is appropriation profits. The payment of dividend reduces cash resources and thereby, affects working capital to that extent. Conversely, if the firm does not pay dividends but retains profits, the working capital increases. In other words, declaration of dividends leads to more working capital requirement and vice versa.

14. ***Operating Efficiency:*** The operating efficiency of the firm relates to the optimum utilisation of resources at minimum costs. Efficiency of operations accelerates the pace of cash cycle and involves the working capital turnover. In this case the amount of working capital needed is less since it releases pressure by improving profitability and improving the internal generation of funds.

15. ***Availability of Credit:*** The need for working capital in a firm will be less, if it avails liberal credit facilities. Similarly, the availability of credit from banks also influences the working capital needs of the firm. A firm enjoying bank credit facilities can secure funds to finance its working capital requirement very easily, whenever it requires. It can therefore, perform its business activities with less working capital than a firm without such credit facility.

The amount of working capital is also influenced by the inventory policies, depreciation policies, management attitude and wages and government policies.

Notes

8.4 Estimation of Working Capital

Determination of Working Capital

Working capital required is calculated based on the assumption that the production or sales is carried on evenly throughout the year and all costs accrue similarly. Exclusion of depreciation is necessary from sales price since it is out of profit costs [it does not involve cash outflow. In other words, computation of working capital required is based on the cash cost only.

Working capital is equal to the current assets minus current liabilities. In other words, working capital consisting two components, such as current assets and current liabilities. Hence, for estimation of working capital, there is a need to follow the following *Four*-step procedure:

1. Estimation of cash cost of the various current assets required by the firm.
2. Estimation of spontaneous current liabilities of the firm.
3. Compute net working capital by subtracting the estimate current liabilities (step 2) from current assets (step 1).

Add some percentage (given in the problem) of net working capital if there is any contingency or safety working capital required, to get the required working capital.

Notes **Statement of Working Capital Needed**

Particulars	Amount (in ₹)	Amount (in ₹)
A. Estimation of Current Assets:		
(i) Raw materials	XXX	
(ii) Work-in-process		
Raw materials (full cost) XX		
Direct labour (to the extent of completed stage) XX		
Overheads (to the extent of completed stage) XX	XXX	
(iii) Finished goods inventory	XXX	
(iv) Debtors	XXX	
(v) Cash balance required	XXX	
Total Current Assets		
B. Estimation of Current Assets:		
(i) Creditors	XXX	
(ii) Expenses		
Overheads XX	XXX	
Labour XX		
Total Current Liabilities		XXX
C. Working Capital (A-B)		XXX
Add: Contingency (Percentage on working capital)		XXX
D. Working Capital Required		XXXX

Notes

Notes Symbols used in the formulas:

BP = Budgeted Production (in units)

RMC = Raw Materials Cost per unit

ARM HP = Avg. Raw Materials Holding Period

EWIP = Estimated Work-in-Process cost per unit

ATSWIP = Avg. Time Span of Work-in-Process inventory

CGP = Cost of Goods Produced (excluding depreciation) per unit

FGHP = Finished Goods Holding Period

BCS = Budgeted Credit Sales in units

CS = Cost of Sales (excluding depreciation) per unit

ADCP = Avg. Debt Collection Period

CPAS = Credit Period Allowed by Suppliers

DWC = Direct Wages Cost per unit

LPW = Lag in Payment of Wages

OHC = Overhead Cost per unit of production

LPOH = Lag in Payment of Overheads

Estimation of components of current assets and current liabilities:

1. ***Estimation of Current Assets:***

   (a) *Investment in Raw Materials Inventory:* BP (in units) × RMC per unit × ARM HP (months/days) ÷ 12 months/365 days.

   (b) *Investment in Work-in-process Inventory:* Work-in-process cost (permit) is proportionate share of the cost of direct materials and conversion costs. Conversion costs include labor and manufacturing overheads costs excluding depreciation, since it is out of pocket cost. Generally, raw materials cost is fully considered, if there is no information about the raw materials requirement. With regards to the share of labor and overhead cost, it is based on the work completion stage.

Example: If the work is completed to the extent of 50 per cent then only 50 per cent labour cost and overhead cost is taken into consideration for estimation of work-in-process cost. If there is no information about the completion stage then the option is left out to the estimation of working capital (it is better to consider that work completion stage is 50 per cent).

BP (in units) × EWIP per unit × ATSWIP (months/days) ÷ 12 months/365 days

   (c) *Investment in Finished Goods Inventory:* BP (in units) × CGS per unit × FGHP (months/days) ÷ 12 months/365 days.

   (d) *Investment in Debtors:* BCS (in units) × CS per unit × ADCP (months/days) ÷ 12 months/365 days.

   (e) *Cash and Bank Balance:* Maintenance of minimum working capital includes a minimum cash balance, but it is very difficult to calculate minimum cash balance required.

Notes

Generally determination of minimum cash balance would be based on the motives for holding cash of business firm, attitude of management towards risk, accessibility of the firm to the sources of finance, when needed and past experience etc. Generally in examinations the minimum cash balance will be provided.

2. ***Estimation of Current Liabilities:***

(a) *Trade Debtors:* BP (in units) × RMC per unit production × CPAS (months/days) ÷ 12 months/365 days.

(b) *Direct Wages:* BP (in units) × DWC per unit × LPW (months/days) ÷ 12 months/365 days.

(c) *Overheads:* BP (in units) × OHC per unit of production × LPOH (months/days) ÷ 12 months/365 days.

Example: From the following information of VSGR Company Ltd., estimate the working capital needed to finance a level of activity of 1,10,000 units of production after adding a 10 per cent safety contingency.

	Amount (per unit)
Raw materials	78
Direct labour	29
Overheads (excluding depreciation)	58
Total cost	165
Profit	24
Selling price	189

Additional information:

Average raw materials in stock: One month

Average materials-in-process (50 per cent completion stage): Half a month

Average finished goods in stock: One month

Credit allowed by suppliers: One month

Credit allowed to customers: two months

Time lag in payment of wages: One and half weeks

Overhead expenses: one month

One fourth of the sales is on cash basis. Cash balance is expected to be ₹ 2,15,000. You may assume that production is carried on evenly throughout the year and wages and overhead expenses accrue similarly.

Solution:

Notes

Estimation of working capital needed

Particulars	Amount (Rs)	Amount (Rs)
A. Estimation of Current Assets: i) Raw materials inventory: One month: (1,10,000 **x** 78 **x** 4/52) ii) Work-in-process inventory: Half a month Raw materials (1,10,000 **x** 78 **x** 2/52) = 3,30,000 Direct labour (1,10,000 **x** 14.5 **x** 2/52) = 61,346.15 Overheads (1,10,000 **x** 29 **x** 2/52) = 1,22,692.31 iii) Finished goods inventory: One month: (1,10,000**x**165**x**4/52) iv) Debtors: Two months: (82,500 **x** 165 **x** 8/52) v). Cash balance required	6,60,000 5,14,038.46 13,96,153.85 20,94,230.77 2,15,000	
Total Current Assets 48,79,423.08		
B. Estimation of Current Liabilities: i) Creditors: One month: (1,10,000 **x** 78 **x** 4/52) ii) Expenses: Overheads (1,10,000 **x** 58 **x** 4/52) = 4,90,769.23 Labour (1,10,000 **x** 29 **x** 3/104) = 92,019.23	6,60,000 582,788.46	
Total Current Liabilities		**12,42,788.46**
C. Working Capital(A-B) **Add:** 10% Contingency		**36,36634.62** **3,63,663.46**
D. Working Capital Required		**40,00,298.08**

8.5 Sources of Working Capital

There are three financing policies vis-à-vis to financing current assets. Adoption of the specific policy is left out to the firm. The three financing policies are:

1. ***Short-term Financing:*** Generally current assets should be financed by only short-term financial sources. Short-term finance is obtained for a period of less than one year. The sources of short-term finance are loans from banks, public deposits, commercial papers, factoring of receivables, bills discounting, retention of profits etc., a firm, which required short-term finance, can go for any one of these sources. In other words, a firm that required short term finance can raise through any one of the sources.

2. ***Long-term Financing:*** Net current assets or permanent current assets or working capital are supposed to be financed by long-term sources of finance. Long-term finance is raised for a period of more them five years. Long-term finance sources include, ordinary share capital, preference share capital, debentures, long-term loans from bankers, and surpluses (includes retained earnings). A firm that needs to finance net current assets can go for any of these sources, but it depends on company's attitude towards risk or control over the company, companies earnings, capacity and period of loan reserved.

3. ***Spontaneous Financing:*** It refers to the automatic sources of short-term funds arising in the normal course of a business. The source includes trade credit (suppliers') and outstanding expenses. Spontaneous sources of finance is available at no cost. A firm that wishes to maximize owner's wealth, it must and should utilize these sources to the fullest extent. The real choice of financing current assets, is between short–term and long-term sources. In other words, some extent of current assets can be financed with the use of spontaneous source, and the requiring current assets should be financed with the combination of long-term and short-term sources of finance.

Notes

Illustration 1: X & Y company is desirous to purchase a business and has consulted you. You are asked to advise them regarding the average amount of working capital, which will be required in the first year's working.

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

			Amount for the year (₹)
(i)	Average amount backed up for stocks		
	Stocks of finished goods		5,000
	Stocks of stores, materials etc.		8,000
(ii)	Average credit given:		
	Island sales 6 weeks' credit		3,12,000
	Export sales 1½ week's credit		78,000
(iii)	Average time lag in payment of wages and other		
	Outgoings:		
	Wages	1½ Weeks	2,60,000
	Stock, materials etc.	1½ months	48,000
	Rent Royalties, etc.	6 months	10,000
	Clerical staff	1½ months	62,400
	Manager	1½ months	4,800
	Miscellaneous expenses	1½ months	48,000
(iv)	Payment in advance:		
	Sundry expenses (paid quarterly in advance)		8,000
	Undrawn profits on the overage throughout the year		11,000

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

Solution:

Statement showing working capital for X & Y Company

			Amount (₹)
A.	***Current Assets***		
	(i)	Stock of finished goods	5,000
	(ii)	Stock of stores, materials etc.	8,000
	(iii)	Debtors	
		Credit sales $\frac{\text{Rs. } 312000 \times 6 \text{ weeks}}{52 \text{ weeks}}$	36,000
		Export Sales for 1½ Weeks $\frac{\text{Rs. } 78000 \times 1\frac{1}{2} \text{ week}}{52 \text{ weeks}}$	2,250

Notes

(iv)	Advance payment of sundry expenses:	2,000
	Total investment in Current Assets (A)	53,250
B.	***Current Liabilities***	
(i)	Wages $\left[\frac{₹2,60,000 \times 1\frac{1}{2}\text{weeks}}{52\text{weeks}}\right]$	7,500
(ii)	Stocks, materials etc. $\left[\frac{₹48,000 \times 1\frac{1}{2}\text{months}}{12\text{months}}\right]$	6,000
(iii)	Rent, Royalties, etc. $\left[\frac{₹10,000 \times 6\text{ months}}{12\text{months}}\right]$	5,000
(iv)	Clerical Staff $\left[\frac{₹62,400 \times \frac{1}{2}\text{months}}{12\text{months}}\right]$	2,600
(v)	Manager $\left[\frac{₹48,000 \times \frac{1}{2}\text{months}}{12\text{months}}\right]$	200
(vi)	Miscellaneous expenses $\left[\frac{₹48,000 \times 1\frac{1}{2}\text{months}}{12\text{months}}\right]$	6,000
Total estimated of Current Liabilities (B)		27,300
C.	Net working capital (A-B) (53,250-27,300)	25,950
	Add: 10% contingency allowance (10% of 25,950)	2,595
D.	Average working capital	28,545

Notes

1. For calculations, a time period of 52 weeks/12 months has been assigned in a year.
2. Undrawn profit has been ignored in the working capital computation for the following reasons:
   (a) For the purpose of determining working capital provided by net profit, it is necessary to adjust the net profit for income – taxes and dividends.
   (b) Profit need not always be a source of finance working capital. It may be used for other purposes like purchases of fixed assets, repayment of long-term loans etc.
3. Actual working capital requirement would be more than what is estimated here as in the problem cash component of current assets is not given.

Illustration 2: XYZ Company sells goods on a gross profit of 25% depreciation is taken into account as a part of cost production. The following are the annual figures given to you:

Sale (Two month's Credit)	18,00,000
Materials consumed (One month's credit)	4,50,000
Wages paid (One month lag in payment)	3,60,000
Cash manufacturing expenses (One month lag in payment)	4,80,000

Notes

Administration expenses (One month lag in payment)	1,20,000
Sales promotion expenses (Paid quarterly in advance)	60,000
Income tax payable in four installments of which one lies in the (next year)	1,50,000

The company keeps one month's stock of both raw-materials and finished goods. It also keeps Rs. 1,00,000 in cash. You are required to estimate the working capital requirements of the company on cash cost basis assuming 10% safety margin.

Solution:

Statements showing working capital requirements on cash cost basis:

		Amount (₹)
A.	***Current Assets***	
	Debtors (cash cost of goods sold) $\left[\frac{14,70,000 \times 2\,\text{months}}{12\,\text{months}}\right]$	2,45,000
	Prepared sales expenses $\left[\frac{₹60,000 \times 3\,\text{month}}{12\,\text{months}}\right]$	15,000
	Inventories	
	Raw – materials $\left[\frac{₹4,50,000 \times 1\,\text{month}}{12\,\text{months}}\right]$	37,500
	Finished goods $\left[\frac{₹12,90,000 \times 1\,\text{month}}{12\,\text{months}}\right]$	10,7,500
	Cash in hand (given)	1,00,000
	Total current Assets (A)	5,05,000
B.	***Current Liabilities***	
	Sundry Creditors $\left[\frac{₹4,50,000 \times 1\,\text{month}}{12\,\text{months}}\right]$	37,500
	Outstanding manufacturing expenses $\left[\frac{₹4,80,000 \times 1\,\text{month}}{12\,\text{months}}\right]$	40,000
	Outstanding administration expenses $\left[\frac{₹1,20,000 \times 1\,\text{instalment}}{12\,\text{months}}\right]$	10,000
	Provision for taxation $\left[\frac{₹1,50,000 \times 1\,\text{month}}{4\,\text{installments}}\right]$	37,500
	Wages paid $\left[\frac{₹3,60,000 \times 1\,\text{month}}{12\,\text{months}}\right]$	30,000
	Total Current Liabilities (B)	1,55,000
C.	Net working capital (A-B) (5,05,000 – 1,55,000)	3,50,000
	Add: 10% contingency allowance (10% of 3,50,000)	35,000
D.	Average working capital	3,85,000

Working Notes **Notes**

1.	Calculation of manufacturing expenses:		
	Sales		18,00,000
	Less: Gross profit 25% on sales		4,50,000
	Total cost manufacture		13,50,000
	Less: Cost of materials	4,50,000	
	Cost wages	3,60,000	8,10,000
	Manufacturing Expenses		5,40,000
2.	***Depreciation:***		
	Manufacturing Expenses		5,40,000
	Less: Cash manufacturing expenses		4,80,000
			60,000
3.	***Calculation of Total cash cost:***		
	Total cost of manufacture		13,50,000
	Less: Depreciation		60,000
			12,90,000
	Administration expenses	1,20,000	
	Sales expenses	60,000	1,80,000
	Total Cost		14,70,000

Illustration 3:

Cost sheet of XYZ company provides the following particulars:

	Amount per unit (₹)
Raw –materials	80
Direct labour	30
Overhead	60
Total cost	170
Profit	30
Selling price	200

The following further particulars are available:

Raw materials in stock, on average one month: Materials are in process, on an average of half a month ; Finished Goods in Stock, on an average of one month.

Credit allowed by suppliers in one month: Credit allowed to debtors is two months ; average time-lag in payment of wages is 1½ weeks and is one month in overhead expenses; one fourth of the output is sold against cash ; cash in hand and at bank is expected to be ₹ 3,65,000. You are required to prepare a statement showing the working capital needed to finance a level of activity of 1,04,000 units of production.

You may assume that production is carried on evenly throughout the year, and wages and overheads accrue similarly (WIP at 50% completion stage).

Notes *Solution:*

Statement showing working capital requirements

		Amount (₹)
A.	***Current Assets***	
(i)	Stock of materials for 1 month [i.e. 4 weeks]	
	$\left[\frac{1,04,000\,\text{units} \times ₹80 \times 4\,\text{weeks}}{52\,\text{weeks}}\right]$	6,40,000
(ii)	Work in progress for 2 weeks	
	(a) Material $\left[\frac{1,04,000 \times 80 \times 2\,\text{weeks}}{52\,\text{weeks}}\right] \times 50\%$ completion	1,60,000
	(b) Labour $\left[\frac{1,04,000\,\text{units} \times ₹30 \times 2\,\text{weeks}}{52\,\text{weeks}}\right]$ × 50% completion	60,000
	(c) Overheads $\left[\frac{1,04,000\,\text{units} \times ₹60 \times 2\,\text{weeks}}{52\,\text{weeks}}\right]$ × 50% completion	1,20,000
(iii)	Finished goods for 1 month (ie. 4 weeks)	
	(a) Material $\left[\frac{1,04,000 \times 80 \times 4\,\text{weeks}}{52\,\text{weeks}}\right]$	6,40,000
	(b) Labour $\left[\frac{1,04,000 \times 30 \times 4\,\text{weeks}}{52\,\text{weeks}}\right]$	2,40,000
	(c) Over heads $\left[\frac{1,04,000 \times 60 \times 4\,\text{weeks}}{52\,\text{weeks}}\right]$	4,80,000
(iv)	Debtors for 2 months (i.e. 8 weeks)	
	$\left[\frac{78000\,\text{units} \times ₹170 \times 8\,\text{weeks}}{52\,\text{weeks}}\right]$	20,40,000
(v)	Cash in hand and at Bank (Given)	3,65,000
	Total investments in Current Assets (A)	47,45,000
B.	***Current Liabilities***	
(i)	Creditors for one month	
	1 month's purchase of Raw – Materials i.e.	
	$\left[\frac{1,04,000 \times ₹80 \times 4\,\text{weeks}}{52\,\text{weeks}}\right]$	= 6,40,000
(ii)	Average time-lag in payment of expenses:	
	(a) Overheads (a month) $\left[\frac{1,04,000 \times 60 \times 4\,\text{weeks}}{52\,\text{weeks}}\right]$	= 4,80,000
	(b) Labour (1½ weeks) $\left[\frac{1,04,000 \times 30 \times 1\frac{1}{2}\,\text{weeks}}{52\,\text{weeks}}\right]$	= 90,000
	Total estimate of current Liabilities (B)	12,10,000

Notes

C.	Net Working Capital (A – B) (47,45,000 – 12,10,000)	35,35,000
	Contingencies allowance	NIL
D.	Average working capital required	35,35,000

Notes 26,000 units have been sold for cash

[1,04,000 x ¼ = 26,000] and credit sales for remaining units i.e. 1,04,000 is 78,000 only.

2. Profits are to be adjusted for income. Tax and dividend payments. For these reasons, profits have been ignored.
3. All overheads are assumed to be variable. Presence of depreciation element in overheads will lower the working capital requirement.

Case Study

Mysore Lamps Limited

Mysore Lamps Limited is a company specializing in the production of fluorescent lamps. The company has been maintaining the quality of its products and due to the efforts of its marketing manager, the company has been able to capture a sizeable share of the product market in the recent past. The company is planning to expand in the same product line. Mr. Mysore, the Managing Director of the company, is confronted with the problem of increasing working capital due to the expansion plans of the company.

Mysore Lamps Limited was set up in 1991 with an authorized capital of ₹ 110 crore and faced heavy competition in the initial years of commencement of business. During 2006, the company could make a dent in the fluorescent lamps market and its position as on December 31, 2006, was as shown in Exhibit 1.

Exhibit 1: Balance Sheet

(Rs. in lakhs)

Liabilities	Rs.	Assets	Rs.
Capital	1500	Fixed assets	1000
Reserves	762	Current assets	1862
Long-term loan	400	Raw materials	200
Current liabilities	200	Work-in-progress	287
Finished goods	450	Accounts receivables	675
Bank overdraft	962	Cash	250
Total	4274	Total	4274

During the year 2006, the company was able to sell 50 lakh pieces of fluorescent lamps a Rs. 60 with a profit margin of 10 per cent. The raw material comprised about 50 per cent of the selling price; while wages and overheads accounted for 12 and 18 per cent, respectively.

As a policy, the company keeps raw material stock for two months of its requirements. In order to make prompt supply to customers on orders received, finished goods stock for two months requirements is maintained, and sales credit of 3 months is given to customers. Due to the standing of the company in the market, the company is able to enjoy 2 months from its suppliers. The production process is of 30 days duration.

Contd...

Notes

Mr. Mysore is seriously considering the proposal for expansion by installing an automatic plant costing ₹ 30 crores. The expansion will bring in an additional capacity of 100 lakh units per annum. Mr. Mysore is not worried about the financing of this plant as the same would be done for the retained earnings supplemented by finances from Mr. Mysore's personal sources. He expects that the company would be able to increase its sale from 50 lakh pieces after the expansion scheme.

Questions

1. As a manager, what steps would you take to effectively manage the working capital in an inflationary situation?
2. What additional informations are required while evaluating the additional working capital requirement and expansion plans?
3. What steps must be taken to manage the working capital effectively under inflationary situation? What would be the effect of expansion plan on working capital requirement?

8.6 Summary

- Working capital management is concerned with the problems that arise in attempting to manage the current assets, current liabilities and their inter-relationship that exists between them.
- Working capital management goal is maintain a satisfactory level of working capital.
- Gross Working Capital Concept focuses attention on the two aspects of current assets management; they are optimum investment in current assets, and financing of current assets.
- Net working capital concept focuses attention on maintaining liquidity position, and to decide upon the extent of long-term capital in financing current assets.
- The working capital management is concerned with determination of relevant levels of current assets and their efficient use as well as the choice of the financing mix.
- The time that elapses to convert raw materials into cash is known as operating cycle
- Cash Conversion Cycle (CCC) is the time length between the payment for suppliers of raw materials and the collection of cash for sales, CCC = OC – APP.
- There are three financing policies vis-à-vis, to finance current assets.

8.7 Keywords

Gross Working Capital: The total current assets are termed as the gross working capital.

Net Working Capital: The excess of current assets over current liabilities represents net working capital.

Permanent Working Capital: It is the minimum investment kept in the form of inventory of raw materials, work in progress, finished goods, stores and spares, and book debts to facilitate uninterrupted operation in a firm.

Temporary Working Capital: Any additional working capital apart from permanent working capital required to support the changing production and sales activities is referred to as temporary working capital.

Working Capital: It refers to short-term funds to meet operating expenses.

Notes

8.8 Self Assessment

Fill in the blanks:

1. Total of all current assets ..... .
2. The excess of current assets over current liabilities ..... .
3. Gross operating cycle equal to inventory conversion period plus ..... .
4. The time elapses between the receipt of raw materials and payment to suppliers ....
5. Net operating cycle equal to gross operating cycle less ..... .
6. When current assets are less than current liabilities then the resulting figure is ..... .
7. Components of working capital are ..... .
8. The automatic sources of short-term funds arising in the normal course of business is known as ..... .

State whether the following statements are true or false:

9. Working capital is the part of current assets that are supposed to be financed by long-term sources of finance.
10. Net working capital is the excess of current assets over current liabilities.
11. Negative working capital is the excess of current assets over current liabilities.
12. Trade credit is the source of working capital.
13. Operating cycle and cash cycle both are one and the same.
14. Depreciation is source of working capital.
15. In boom period working capital requirement is less.
16. Manufacturing companies require less amount of working capital.
17. Utilization of fixed assets depends on the availability of working capital.
18. Net operating cycle is equal to the gross operating cycle plus payables differed period.

8.9 Review Questions

1. From the following information RRR Company Ltd., for the next year, you are required to estimate the working capital needed to finance a level of activity of 2,08,000 units of production after adding a five per cent safety contingency.

	Amount (per unit)
Raw materials	160
Direct labour	60
Overheads (including depreciation of ₹10)	130
Total cost	350
Profit	50
Selling price	400

Additional information

Average raw materials in stock: one month

Notes

Average materials-in-process (50 per cent completion stage): half a month

Average finished goods in stock: one month

Credit allowed by suppliers: one month

Credit allowed to customers: two months

Time lag in payment of wages: one and half weeks

All sales are credit sales. Cash balance is expected to be ₹ 75,000. You may assume that production is carried on evenly throughout the year and wages and overhead expenses accrued similarly.

2. From the following information estimate working capital required for the level of activity 78,000 units. You may assume that production is carried on evenly throughout the year and wages and overhead expenses accrue similarly and a time period of four weeks is equivalent to a month.

	Amount (per unit)
Raw materials	45
Direct labour	20
Overheads	37.5
Total cost	102.5
Profit	22.5
Selling price	125

Additional information

Raw materials in stock: two weeks; Materials-in-process: one week; Finished goods in stock: two weeks; Credit allowed by suppliers: half month; Credit allowed to customers: four weeks; Overheads: two weeks; Cash at bank is expected to be ₹30, 000. 80% of sales are credit sales.

3. You are requested by A.P. Paper Mills Limited to estimate working capital required for the level of activity of 6,24,000 units of production. Add 5 per cent for safety. It provides the following information. You may assume that production is carried on evenly throughout the year and wages and overhead expenses accrued similarly and a time period of four weeks is equivalent to a month.

	Amount (per unit)
Raw materials	90
Direct labour	40
Overheads	80
Total cost	210
Profit	60
Selling price	270

Additional Information

Raw materials in stock: one month; Materials-in-process: half month; Finished goods in stock: four weeks; Credit allowed by suppliers: one month; Credit allowed to customers: eight weeks; lag in payment of wages: one and half week; Overheads: one weeks; 20 per cent of sales are cash sales and cash at bank is expected to be ₹60, 000.

Notes

4. DP Mills Limited has the following information as for the year 2003.

   Sales – ₹ 3782.79 lakhs Cost of Goods sold – ₹ 3444.47 lakhs

   Opening inventory – ₹ 856.25 lakhs closing inventory ₹ 1037.73 lakhs

   Accounts Receivables: Opening – ₹ 852 lakhs, Closing – ₹ 636.88 lakhs

   Accounts Payables: Opening: ₹ 832.96 lakhs Closing : 84689 lakhs

   Calculate (a) OC and (b) CCC

5. Discuss the steps involved in estimation of working capital needed by a firm.
6. What is working capital? Is there any significant difference in the concepts of gross working capital and net working capital? Discuss in detail.
7. What is working capital management? What is the need to maintain optimum working capital? Discuss the consequences of inadequate and excess working capital.
8. What is cash cycle or net operating cycle?
9. Discuss the significance of gross working capital and net working capital.
10. "Working capital must be adequate but at the same time not excessive". Comment.

Answers: Self Assessment

1.	Gross working capital	2.	Net working capital
3.	Debtors collection period	4.	Cash cycle
5.	payables differed period	6.	Negative working capital
7.	Current assets and current liabilities	8.	Spontaneous
9.	True	10.	True
11.	False	12.	True
13.	False	14.	True
15.	False	16.	False
17.	True	18.	True

8.10 Further Readings

Books

Chandra, P., *Financial Management - Theory and Practice*, New Delhi, Tata McGraw Hill Publishing Company Ltd., 2002, p. 3.

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Online link http://www.fei.org/

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Unit 9: Basics of Receivables

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Objectives

After studying this unit, you will be able to:

- Define meaning and characteristics of receivables
- Discuss concept of accounts receivables management
- Explain credit policy
- Describe credit evaluation and monitoring

Introduction

Accounts Receivables occupy an important position in the structure of current assets of a firm. They are the outcome of rapid growth of credit sales granted by the firms to their customers. Credit sales are reflected in the value of Sundry Debtors [SD's In India]. It is also known as Trade Debtors (TD's), Accounts Receivables (AR's), Bills Receivables (BR's) on the asset side of balance sheet. Trade credit is most prominent force of modern business. It is considered as a marketing tool acting as a bridge between production and customers. Firm grants credit to protect its sales from the competitors and attract the potential customers. It is not possible to increase sales without credit facility, increase in sales also increases profits. But investments on accounts receivables involve certain costs and risks. Therefore, a great deal of attention is normally paid to the effective and efficient management of accounts receivables.

Notes

9.1 Meaning and Characteristics of Accounts Receivables

The term receivable is defined as "debt owed to the firm by customers arising from sale of goods or services in the ordinary course of business".

Did u know? When the firm sells its products services on credit, and it does not receive cash for it immediately, but would be collected in near future. Till collection they form as current assets.

The accounts receivables arising out of credit sales have the following characteristics'.

1. ***Risk Involvement:*** Receivables involve risk, since payment takes Bajaj in future, and future is uncertain so they should carefully analyzed.
2. ***Based on Economic Value:*** Accounts receivables are based on economic value. The economic value in goods or services passes to the buyer currently in return the seller expects an equivalent value from the buyer latter.
3. ***Implies Futurity:*** Buyer will make cash payment of the goods or services received by him/her in a future period. [i.e generally after credit period]

9.2 Concept of Account Receivable Management

Accounts Receivable Management, means making decisions relating to the investment in current assets as an integral part of operating process. The objectives of the accounts receivables management are the maximization of return on investment in receivables. In other words, accounts receivables management involves maintenance of receivables of optimum level, the degree of credit sales to be made, and the debtor's collection.

9.2.1 Objectives of Accounts Receivables Management

The following are the main objectives of accounts receivables management:

1. ***Maximizing the Value of the Firm:*** The basic objective of debtors' management is to maximise the value of the firm by achieving a trade off between liquidity (risk) and return. The main purpose of receivables management is to minimise the risk of bad debts and not maximisation of order. Efficient management of receivables expands sales by retaining old customers and attracting new customers.
2. ***Optimum Investment in Sundry Debtors:*** Credit sales expand, but they involve block of funds, that have an opportunity cost, which can be reduced by optimum investment in receivables. Providing liberal credit increases sales consequently profits will increase, but increasing investment in receivables results in increased costs.
3. ***Control and Cost of Trade Credit:*** When there are no credit sales, there will not be any trade credit cost. But credit sale increases profits. It is possible only when the firm is able to keep the costs at minimum. The costs are discussed below.

9.2.2 Costs of Accounts Receivables Management

Management of accounts receivables is not cost free. The following are the main costs associate with accounts receivables management:

1. ***Opportunity Cost/Capital Cost:*** Providing goods or services on credit involves block of firm's funds. In other words, the increased level of accounts receivables is an investment in current assets. These blocked funds or investment in receivables need to be financed, by

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shareholders funds or from short-term borrowings. They involve some cost. If receivables are financed by shareholder funds, there involves opportunity cost to shareholders. If they are financed by borrowed funds, it involves payments of interest, which is also a cost.

2. ***Collection Cost:*** Collection of receivable is one of the tasks of receivables management. Collection costs are those costs that are increased in collecting the debts from the customers to whom the credit sales have been granted. The collection costs may include, staff, records, stationary, postage they are related to maintenance credit department, and exposes details involved in collecting information about prospective customers, from specialized agencies, for evaluation of prospective customer before going to grant credit.

3. ***Bad Debts:*** Some times customer may not be able to honour the dues to the firm because of the inability to pay. Such costs are referred as bad debts, and they have to be written off, because they cannot be collected. These costs can be reduced to some extent, if the firm properly evaluates customer before granting credit, but complete avoidance is not possible.

9.3 Factors Influencing the Size of Investment in Receivables

The level of investment in receivables is affected by the following factors:

1. ***Volume of Credit Sales:*** Size of credit sale is the prime factor that affects the level of investment in receivables. Investment in receivable increase when the firm sells major portion of goods on credit base and vice versa. In other words an increase in credit sales, increase the level of receivables and vice versa.

2. ***Credit Policy of the Firm:*** There are two types of credit policies such as lenient and stringent credit policy. A firm that is following lenient credit policy tends to sell on credit to customers very liberally, which will increase the size of receivables. On the other hand, a firm that following stringent credit policy will have low size of receivables because the firm is very selective in providing of stringent credit. A firm that is providing string one credit, may be able to collect debts promptly this will keep the level of receivables under control.

3. ***Trade Terms:*** It is the most important factor (variable) in determining the level of investment in receivables. The important credit terms are credit period and cash discount. If credit period is more when compared to other companies/industry, then the investment in receivables will be more. Cash discount reduces the investment in receivables because it encourages early payments.

4. ***Seasonality of Business:*** A firm doing seasonal business has to provide credit sales in the other seasons. When the firm provides credit automatically the level of investment in receivables will increase with the comparison of the level of receivables in the season; because in season firm will sell goods on cash basis only.

   For example, refrigerators, air-cooling products will be sold on credit in the winter season and on cash in summer season.

5. ***Collection Policy:*** Collection policy is needed because all customers do not pay the firm's bill on time. A firm's liberal collection policy will not be able to reduce investment in receivables, but in future sales may be increased. On the other hand, a firm that follows stringent collection policy will definitely reduce receivables, but it may reduce future sales. Therefore, the collection policy should aim at accelerating collections from slow payers and reducing bad debt base.

6. ***Bill Discounting and Endorsement:*** Bill discounting and endorsing bill to the third party, which the firm has to pay, will reduce the size of investment in receivables. If the bills are dishonored on the due date, again the investment in receivable will increase because discounted bills or endorsed bills have to be paid by the firm.

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9.4 Credit Policy

Credit policy means a firm's credit policy regarding its credit standards, credit period, cash discounts, and collection procedures. The credit policy may be lenient or stringent (tight).

Lenient Credit Policy

It is that policy where the seller sells goods on very liberal credit terms and standards. In other words, goods are sold to the customers whose creditworthiness is not up to the standards or whose financial position is doubtful.

Stringent Credit Policy

Stringent credit policy seller sells goods on credit on a highly selective basis only i.e., the customers who have proven creditworthiness and financially sound.

Notes **Credit Policy Variables**

The major credit policy variables include the following:

1. ***Credit Standards:*** Firm has to select some customers for extension of credit. For this firm has to evaluate the customer. In evaluation of customers what standards should be applied? Credit standards refer to the minimum criteria for the extension of credit to a customer. Credit ratings, credit references, average payment periods, and certain financial ratios provide a quantitative basis for establishing and enforcing credit standards.
2. ***Credit Terms:*** The second decision criteria in receivables management are the credit terms. Credit terms mean the stipulations under which goods or services are sold on credit. Once the credit terms have been established and the credit worthiness of the customers has been assessed, then the financial managers have to decide the terms and conditions on which the credit will be granted. The credit terms specify the lengthy of time over which credit is extended to a customer and the discount, if any, given for early payment. Credit terms have three components such as: (i) credit period, and (ii) cash discount, and (iii) cash discount period.
3. ***Collection Policy:*** This is the third aspect in receivables management. The collection of a firm is the procedures passed to collect amount receivables, when they become due. It is needed because all customers do not pay the bill receivables in time collection procedures includes monitoring the state of receivables, dispatch of letters to customers whose due date is approaching, electronic and telephonic advice to customers around the due date, threat of legal action to overdue customers, and legal action against overdue accounts.

9.5 Credit Evaluation of Individual Accounts

Receivables management requires a lot of decision making exercises, setting credit standards, identifying credit terms (credit period and cash discount), collection policy, evaluation of individual accounts. Evaluation of individual accounts is the prime activity, which affects firm's profitability. In this, firm should develop procedures for evaluating credit applicants and consider the possibilities of bad debt or slow payment. Mere determination of appropriate credit policy will not serve the purpose of minimizing investment in receivables and reducing bad debt losses,

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without credit evaluation of individual accounts and identification of their credit worthiness. In other words, the firm has to evaluate the customers before extension of credit.

The credit evaluation procedure involves three related steps:

1. Obtaining credit information
2. Analyzing the information
3. Making the credit decision

9.6 Monitoring Accounts Receivables

Just evaluation of individual accounts does not help in efficient accounts receivables management without continuous monitoring and control of receivables. In other words success of collection effort depends on monitoring and controlling receivables. Then how to monitor and control receivables? There are traditional techniques available for monitoring accounts receivables. They are (a) Receivables turnover, (b) Average Collection period, (c) Aging Schedule and (d) Collection matrix.

1. ***Receivables Turnover:*** Receivables turnover provides relationship between credit sales and debtors (receivables) of a firm. It indicates how quickly receivables or debtors are converted into cash. Ramamurthy observes "collection of debtors is the concluding stage for process of sales transaction". The liquidity of receivables is therefore, is measured through the receivables (debtors) turnover rate.

   Debtors or Receivables Turnover Rate = Credit Sales ÷ Average Debtors or receivables

   Debtor's turnover rate is expressed in terms of times. Analyst may not be able to access credit sales information, average debtors and bills receivables.

   To avoid of non-availability of the above information and to evaluate receivables turnover there is another method available for analyst.

   Debtors or Receivables Turnover Rate = Total Net Sales ÷ Average Debtors (including receivables)

2. ***Average Collection Period (ACP):*** Turnover rate converted into average collection period is a significant measure of the collection activities of debtors. Average collection period is a measure of how long it takes from the time sales is made to the time to cash is collected from the customers.

   ACP = 365 ÷ Debtors or Receivables turnover.

Example: A company's credit sales are ₹ 20 lakhs in a year. The opening debts are ₹2 lakhs and closing debtors are ₹2,10,000. Determine Debtors turnover and ACP.

Solution:

Debtors Turnover Ratio = ₹ 20,00,000 ÷ (Rs.2,00,000 + ₹2,10,000)/2 = 9.75 times

ACP = 365 ÷ 9.75 = 37.43 Days

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Collection Policy

The collection of a firm is the procedures passed to collect amount receivables, when they become due. It is needed because all customers do not pay the bill receivables in time collection procedures includes monitoring the state of receivables, dispatch of letters to customers whose due date is approaching, electronic and telephonic advice to customers around the due date, threat of legal action to overdue customers, and legal action against overdue accounts.

Customers may be divided into two categories. Such as slow payer and non-payers. Hence, there is a need for accelerating collections from slow payers and reduce bad debt losses.

Collection policies may be divided into two categories.

(i) Strict / rigorous

(ii) lenient/lax collection policy.

Adoption of strict collection policy tends to decrease sales, reduces average collection period, bad debt percentage, and increases the collection expenses. On the other hand, lenient collection policy will increase sales average collection period, bad debt losses, and reduce collection expenses. Financial manager has to see the benefits and costs from adopting one credit policy, if the change in net profit is positive, he/she has to go with new credit policy and vice versa.

3. ***Aging Schedule:*** As we have seen in the above average collection period measures quality of receivables in an aggregate manner, which is the limitation of ACP. This can be overcome by preparing aging schedule. Aging schedule is a statement that shows age wise grouping of debtors. In other words, it breaks down debtors according to the length of time for which they have been outstanding.

Example: A hypothetical aging schedule is as follows:

Age Group (in days)	Amount Outstanding (₹)	Percentage of Debtors to total Debtors
Less than 30	40,00,000	40
31 – 45	20,00,000	20
46 – 60	30,00,000	30
Above 60	10,00,000	10
Total	**1,00,00,000**	**100**

4. ***Collection Matrix:*** Traditional methods (debtors turnover rate, average collection period) of receivables management are very popular, but they have limitations, that they are on aggregate data and fail to relate the outstanding accounts receivables of a period with credit sales of the same period. The problem of aggregating data can be eliminated by preparing and analyzing collection matrix. Collection matrix is a method (statement) showing percentage of receivables collected during the month of sales and subsequent months. It helps in studying the efficiency of collections whether they are improving or deteriorating.

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Example: Following table shows hypothetical collection matrix.

Percentage of Receivables collected During the	April	May	June	July	August
Sales (Rs. Lakhs)	350	340	320	300	250
Month of Sales	10	12	14	11	08
First Month following	30	38	40	30	34
Second Month following	25	24	22	20	21
Third Month following	20	26	22	19	18
Fourth Month following	15	10	02	15	20
Fifth Month following	–	–	–	05	09

From the above table, it may be read for April sales are ₹ 350 lakhs. The pattern of collections are 10 per cent in the same month (April), 30 per cent of sales in May, 25 per cent of sales in June, 20 per cent of sales in July and the remaining 15 per cent in the August.

Task VST Co. produces plastic home appliances and it has annual credit sales of ₹ 20 lakhs, the average accounts receivables amount to ₹4,00,000. Compute ACP assuming 365 day year.

Case Study

Yahoo. Products Limited

Yahoo.. Products Limited manufactures a special variety of industrial which are used by other manufacturing units to produce shoes and chappals. The market for the company's product comprises a few large public limited companies and a number of small units run as proprietary or partnership concerns. The sales had in the past proved to be seasonal, with peak sales being recorded in the period January to July (year).

One year back, the company had expanded its production capacity form 4,000 to 9,000 MT per annum. However, the actual production in the financial year Just ended was restricted to 6,000 MT, mainly on account of lack of orders. The cost statement for the year indicated the following:

	₹/MT
Raw Materials (V)	2,500
Direct Labour and Supervision (F)	800
Indirect Materials, Fuel, etc. (F)	500
Depreciation, Insurance, etc. (F)	2,700
Factory Cost of Production	6,500
Administration, Selling and Interest Charges (F)	500
Selling Price per MT (exclusive of all discounts, allowance for freight, etc.)	7,000 ------

Dr. Bhatt the Director was not satisfied by the under utilization of installed capacity and its effect on the profitability of the company. He called his senior managers to discuss the situation and means of improving the profitability of the concern. The Sales Manager,

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on whom the pressure was tried to described the limitation of sales to be the stringent credit policy pursued by the company. He argued that under the strict norms for grant of credit followed by the company, only the larger public limited companies among the customers were on the approved credit list of the company and the smaller customers were put on the cash and carry list. This, he maintained, led to an overdependence on the larger customers and an almost complete neglection of a section of the market consisting of the small manufacturers, who were cultivated by the competition by offering them attractive discounts. In fact, the smaller manufacturers came to his company, only if, the market was starved of the product. The Sales Manager pleaded for a more liberal credit policy which would also help increase the sales volume. He ruled out the possibility of procuring additional volume of business from the big customers who had already evolved a scheme sharing out their business among the different suppliers. Any attempt to obtain more business by offering discounts to the bigger firms, the sales manager argued, will only lead to a retaliatory action by competitors and ultimately escalate into a price war which will only prove disastrous for the company. On the other hand, granting credit to the smaller customer will bring the company's policy in line with competitors and will actually stimulate growth in the consuming industry with beneficial effects to the company.

Dr. Bhatt obviously undecided about the wisdom of extending credit to the smaller customers to boost sales volume, called for a detailed note from both the Sales Manager and the Credit Manager. He, However, pointed out that any such change of credit policy, even if approved, would bring in results only in long run while there was an immediate need to boost sales. The Sales Manager, at this point, conveyed to Dr. Bhatt, an offer he had just received from the Shoe Manager. An offer he had just received from the Shoe Plast Limited, one of the larger public limited company. The controller referred to the substantial investment in receivables that this transaction would entail and reckoning interest at 18 percent per annum which was the rate the company was paying to its bankers; he argued that this transaction would involve an interest burden of ₹ 1,64,250 whereas the profits from the transaction would only be ₹ 90,000. As such the offer was wholly unattractive. Shoe Plast Limited would pay for these additional supplies to be effected in the next three months, in the seventh month from date. It was, however, unwilling to pay an interest on the extended credit term. The Sales Manager pointed out that Shoe Plast Limited ranked high in the ratings by the Credit Department and therefore, there should be no hesitation in accepting this offer for additional business.

The customer company wads carrying out an expansion scheme at that time using partly its current resources to finance the same and was, therefore, finding itself in a difficult liquid situation. It, however, expected this to be only temporary and anticipated that the position would improve considerably after six months. Shoe Plast Limited had made an offer to take 100 MT additional each month in the next three months over and above the regular off-take, if Plastic Products Limited agreed to give special credit terms. The Credit Manager, intervening at this stage, pointed to the high rate of mortality among the smaller firms. He read out a long list of the smaller firms in the industry which had closed their creditors in the last few years. He points out with pride the excellent record of the company in the matter of credit management and to the fact that the company has had no incidence of bad debts in the last smaller manufacturers. He further argued that the company would be taking grave risk if it chose to adopt such a policy, as it would lead to bad debts. About 6 per cent each year, which he was quick to point out, was about the profit margin company appears to have from its products.

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Questions

1. What consideration he should take into account, while revising the credit policy of a company?
2. Advice Dr. Bhatt how he should deal with the circumstances?
3. Define factoring. Briefly discuss the services provided by a factor.
4. What are the various types of factoring?
5. Distinguish between factoring and bill financing.
6. Briefly discuss the appraisal technique followed by a factor.
7. What are the benefits, limitations and constraints of factoring in India?
8. Write a short note on international factoring.

9.7 Summary

- Accounts Receivables occupy an important position in the structure of current assets of a firm.
- The term receivable is defined as debt owed to the firm by customers arising from sale of goods or services in the ordinary course of business.
- The management of accounts receivables is not cost free. It involves cost and its association with accounts receivables results in: Opportunity Cost/Capital Cost, Collection Cost, and Bad Debts.
- Liberal credit policy is that policy where the seller sells goods on very liberal credit terms and standards, which increase in sales, higher profits.
- Stringent credit policy seller sells goods on credit on a highly selective basis only, which reduces bad losses, sound liquidity position.
- Firms should follow optimum credit policy that lies between lenient and stringent credit policy.
- Optimum credit policy occurs at point where there is a trade off between liquidity and profitability.
- Collection policies may be divided into two categories – strict/rigorous, and lenient/lax collection policy.

9.8 Keywords

Collection Policy: It is the procedures passed to collect amount receivables, when they become due.

Credit Terms: It means the stipulations under which goods or services are sold on credit.

Credit Standards: It refers to the minimum criteria for the extension of credit to a customer.

Lenient Credit Policy: It is that policy where the seller sells goods on very liberal credit terms and standards.

Receivables: It is defined as debt owed to the firm by customers arising from sale of goods or services in the ordinary course of business.

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Receivables Management: It involves decision areas: credit standards, credit period, cash discounts and collection procedures.

Stringent Credit Policy: Seller sells goods on credit on a highly selective basis.

9.9 Self Assessment

Fill in the blanks:

1. In India accounts receivables are known as ..... .
2. Debt owed to the firm by customers arising from sale of goods or services in the ordinary course of business is known as ..... .
3. ..... involvement is one of the characteristic features of receivables.
4. ..... is a formal document issued by a bank on behalf of its customers, stating the conditions under which the bank will honor the commitments of the customer (Buyer).
5. Credit terms have three components ....., ... and ..... .
6. ..... represents a percentage of reduction in sales or purchase price allowed for early payment of invoices.
7. Cash discount reduces the investment in receivables because it encourages ..... .
8. ..... is a statement that shows age wise grouping of debtors.
9. ..... is a method (statement) showing percentage of receivables collected during the month of sales and subsequent months.
10. ..... = 365 ÷ Debtors or Receivables turnover.

State whether the following statements are true or false:

11. Receivables constitute to a significant potential current assets.
12. Credit period is one of the terms of credit.
13. Letter of credit is one of the modes of payment.
14. Optimum credit policy occurs where there is a trade of between liquidity and profitability.
15. Bad debt loss is are the losses of receivables management.
16. Credit standards, Credit period, Cash discount and Collection are the variables of credit policy.
17. Monitoring the state of receivables does not include receivables collection procedure.

9.10 Review Questions

1. What is receivables management? Discuss in detail the objective benefits and cost of receivables management.
2. Briefly discuss the factors that influence the size of investment in receivables.
3. What is credit policy? Discuss the types of credit policy's with their advantages and disadvantages.
4. What is the role of credit policy variables in the credit policy of a firm? Discuss.

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5. "The credit policy of a firm is criticized because the bad debt losses have increased". Discuss under what situations this criticism may not be justified.
6. What is credit evaluation? Discuss the steps involved in it.
7. What do you mean by aging schedule?
8. Hare Ram & Co, produces 1,00,000 units and sells at ₹80 per unit. 70 per cent of sales are credit sales. Average receivables amount is ₹2,00,000. Determine average collection period (ACP).
9. Dream Well Company's credit sales for the year 2004 are ₹ 1,50,000. The company was started 2004 year with opening balance of receivables ₹15,000 and 2004 year business is closed with ₹11,000 receivables. Calculate receivables turnover and ACP.
10. Name various costs of accounts receivables management.

Answers: Self Assessment

1.	Sundry debtors	2.	Bills receivables	3.	Risk
4.	Letter of credit	5.	Credit period, Cash discount and Cash discount period		
6.	Cash discount	7.	early payments	8.	Aging schedule
9.	Collection matrix	10.	ACP	11.	True
12.	True	13.	True	14.	True
15.	True	16.	True	17.	False

9.11 Further Readings

Books

Chandra, P., *Financial Management - Theory and Practice*, New Delhi, Tata McGraw Hill Publishing Company Ltd., 2002, p. 3.

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Online links

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Unit 10: Inventory Management

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Objectives

After studying this unit, you will be able to:

- Describe concept of inventory management
- Explain costs of holding inventory and tools of inventory management

Introduction

Inventory management occupies the most significant position in the structure of working capital. Management of inventory may be defined as the sum of total of those activities necessary for the acquisition, storage, disposal or use of materials. It is one of the important component of current assets. Inventory management is an important area of working capital management, which plays a crucial role in economic operation of the firm. Maintenance of large size of inventories by a firm required a considerable amount of funds to be invested on them. Efficient and effective inventory management is necessary in order to avoid unnecessary investment and inadequate investment.

10.1 Meaning and Definition of Inventory

The term "Inventory" is originated from the French word "Inventaire" and the Latin "Inventariom", which implies a list of things found. The term inventory has been defined by the American Institute of Accountants as the aggregate of those items of tangible personal property which (a) are held for sale in the ordinary course of business, (b) are in the process of production for such sales, or (c) are to be currently consumed in the production of goods or services to be available for sale. The term inventory refers to the stockpile of the products a firm is offering for sales and the components that make up the product. Inventories are the stocks of the product of a company, manufacturing for sale and the components that make up the product.

The various components of inventory are as follows:

1. ***Raw Materials:*** Raw materials are those inputs that are converted into finished goods through a manufacturing or conversion process. These form a major input for manufacturing a product. In other words, they are very much needed for uninterrupted production.

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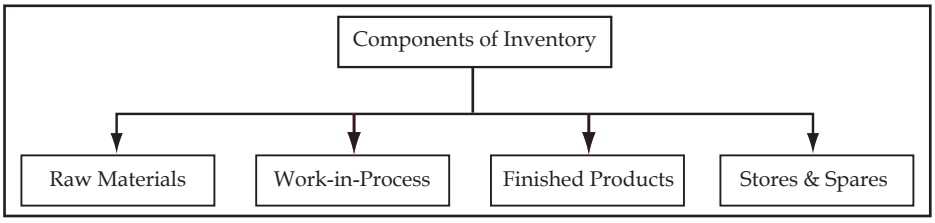
2. ***Work-in-Process:*** Work-in-process is a stage of stocks between raw materials and finished goods. Work-in-process inventories are semi-finished products. They represent products that need to under go some other process to become finished goods.



3. ***Finished Products:*** Finished products are those products, which are completely manufactured and ready for sale. The stock of finished goods provides a buffer between production and market.

4. ***Stores & Spares:*** Stores & spares inventory (include office and plant cleaning materials like, soap, brooms, oil, fuel, light, bulbs etc.) are purchased and stored for the purpose of maintenance of machinery.

Notes **Inventory Management Motives**

There are three general motives for holding inventories:

1. ***The Transaction Motive:*** Transaction motive includes production of goods and sale of goods. Transaction motive facilitates uninterrupted production and delivery of order at a given time (right time).

2. ***The Precautionary Motive:*** This motive necessitates the holding of inventories for unexpected changes in demand and supply factors.

3. ***The Speculative Motive:*** This compels to hold some inventories to take the advantage of changes in prices and getting quantity discounts.

10.2 Costs of Holding Inventories

Minimizing cost is one of the operating objectives of inventory management. The costs (excluding merchandise cost), there are three costs involved in the management of inventories.

1. ***Ordering Costs:*** Ordering costs are those costs that are associated with the acquisition of raw materials. In other words, the costs that are spend from placing an order to raw materials to the receipt of raw materials. They include the following:

   (a) Cost of requisitioning the items (raw materials)

   (b) Cost of preparation of purchase order (i.e., drafting typing, dispatch, postage etc.).

   (c) Cost of sending reminders to get the dispatch of the items expedited.

   (d) Cost of transportation of goods (items).

   (e) Cost of receiving and verifying the goods.

   (f) Cost of in unloading of the (items) of goods.

   (g) Storage and stocking charges.

However, incase of items manufactured in house the ordering costs would comprise the following costs:

(a) Requisitioning cost,

(b) Set-up cost,

(c) Cost of receiving and verifying the items,

(d) Cost of placing and arranging/stacking of the items in the store etc.

Caution Ordering costs are fixed as per order placed, irrespective of the amount of the order but ordering costs increases in proportion to the number of orders placed. If the firm maintains small inventory levels, then the number of orders will increase, there by ordering cost will increase and vice versa.

2. ***Inventory Carrying Costs:*** Inventory carrying costs are those costs, which are associated in carrying or maintaining inventory. The following are the carrying costs of inventory:

   (a) Capital cost [interest on capital locked in the inventories]

   (b) Storage cost [insurance, maintenance on building, utilities serving costs]

   (c) Insurance [on inventory - against fire and theft insurance]

   (d) Obsolescence cost and deterioration

   (e) Taxes

   Carrying costs usually constitute to around 25 per cent of the value of inventories held.

3. ***Shortage:*** *Costs [Costs of stock out]:* Shortage costs are those costs that arise due to stock out, either shortage of raw materials or finished goods.

   (a) Shortage of inventories of raw materials affect the firm in one or more of the following ways:

      (i) The firm may have to pay some higher prices, connected with immediate (cash) procurements.

      (ii) The firm may have to compulsorily resort to some different production schedules, which may not be as efficient and economical.

   (b) Stock of finished goods - may result in the dissatisfaction of the customers and the resultant lead, to loss of rules,

Thus, with a view to keep inventory costs of minimum level, we may have to arrive at the optional level of inventory cost, its total order's cost plus carrying costs are minimum.

In other words, we have to determine Economic Order Quantity (EOQ), at that level in which the total inventory [ordering plus carrying less] cost is minimum.

Did u know? **What is the meaning of EOQ?**

Economic order quantity refers to that level of inventory at which the total cost of inventory is minimum.

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10.3 Tools and Techniques of Inventory Management

Some of the inventory control techniques are as follows:

ABC Analysis

This is the one of the widely used technique to identify various items of inventory for the purpose of inventory control. In other words, it is very effective and useful tool for classifying, monitoring and control of inventories. The firm should not keep same degree of control on all the items of inventory. It is based on Pareto's Law. It is also known as *Selective Inventory Control*. The firm should put maximum control on those items whose value is the highest, with the comparison of the other two items.

The technique concentrates on important items and is also known as Control by Importance and Exception [CIE]. Usually a firm has to maintain several types of inventories, for proper control of they, firm should have to classify inventories in the instance of their relative value. Hence it is also known as *Proportional Value Analysis (PVA)*. The higher value items are classified 'A items' and would be under tight control. At the other end of the classification, we find category 'C items', on this type of inventory, we cannot afford expenses of rigid controls, frequent ordering and expending, because of the low value or low amounts in this area. Thus with the 'C items', we may maintain somewhat higher safety stocks, order more months of supply, expect lower levels of customer service, or all the three. 'B items' fall in between 'A item' and 'C item' and require reasonable attention of management.

According to this technique the task of inventory management is proper classification of all inventory items in to three categories namely A, B and C category. The ideal categorization of inventory items is show in Table.

Category	No. of Items(%)	Item value (%)
A	15	70
B	30	20
C	55	10
Total	100	100

The above table indicates that only 15 per cent of the items may account for 70 percent of the value [A category items], on which greater attention is required, where as 55 per cent of items may account for 10 per cent of the table value of inventory (C category items), will be paid a reasonless attention. The remaining 30 per cent of inventory account for 20 per cent of total value of inventory (B category items will be paid a reasonable attention as this, category value lies between the two other categories.

Economic Order Quantity (EOQ)

Economic order quantity refers to that level of inventory at which the total cost of inventory is minimum. The total inventory cost comprising ordering and carrying costs. Shortage costs are excluded in adding total cost of inventory due to the difficulty in computation of shortage cost.

Did u know? EOQ also known as Economic Lot Size (ELS)

The following assumptions are implied in the calculation of EOQ:

Demand for the product is constant and uniform throughout the period.

Lead time (time from ordering to receipt) is constant.

Price per unit of product is constant.

Notes

Inventory holding cost is based on average inventory.

Ordering costs are constant.

All demands for the product will be satisfied (no back orders are allowed).

EOQ Formula

EOQ can be obtained by adopting two methods (a) Trial and Error approach and (b) Short cut or Simple mathematical formula. Here for calculation of EOQ we have adopted simple short cut method. The formula is

$$EOQ = \sqrt{\frac{2AO}{CC}}$$

Where: A = Annual usage,

O = Ordering cost per order

CC = Carrying cost per unit

CC = Price per unit x Carrying cost per unit in percentage

The above simple formula will not be sufficient to determine EOQ when more complex cost equations are involved.

Caution EOQ is applicable both to single items and to any group of stock items with similar holding and ordering costs. Its use causes the sum of the two costs to be lower than under any other system of replenishment.

Example: A company purchases a component of a product at the rate of ₹ 50 per piece. The annual consumption of that component is 25,000 pieces. If the ordering cost is ₹230 per order and carrying cost is 20 per cent per annum, what would be the EOQ?

Solution: Annual usage – 25,000 units; Cost of placing and receiving one order – ₹ 230;

Cost of materials – ₹ 50 per unit; Annual carrying cost of one unit – 20 per cent of inventory value

$$EOQ = \sqrt{2AO \div CC}$$

$$EOQ = \sqrt{(2 \times 25{,}000 \times 230) \div (50 \times 20/100)} = 1{,}072 \text{ units.}$$

Example: XYZ Company buys 75,000 glass bottles per year. Price of each bottle is ₹0.90. Cost of purchase is ₹ 100 per order; Cost of holding one bottle per year is ₹ 0.20. Bank interest is 15 per cent including a charge for taxes and insurance. Find out EOQ quantity.

Solution: Annual usage – 75,000 units; Cost of placing and receiving one order – ₹ 100

Cost of bottle – ₹ 0.90 per bottle; Annual carrying cost of one bottle – ₹0.20 per bottle

$$EOQ = \sqrt{2AO \div CC}$$

$$EOQ = \sqrt{(2 \times 75{,}000 \times 100) \div 0.335^*} = 6{,}691.50 \text{ units.}$$

* Inventory carrying cost = ₹ 0.20 + [Re.0.90 x 0.15] = ₹0.335

Notes

Order Point Problem

After determination of EOQ, then at what level should the order be placed? If the inventory level is too high, it will be unnecessary blocks the capital, and if the level is too low, it will disturb the production by frequent stock out and also involves high ordering cost. Hence, an efficient management of inventory needs to maintain optimum inventory level, where there is no stock out and the costs are minimum.

The different stock levels are as follows:

1. ***Minimum Level:*** Minimum stock is that level that must be maintained always production will be disturbed, if it is less than the minimum level. How to fix minimum level? While determination of minimum stock level, lead time, consumption rate, the material nature must be considered

   Did u know? **What is Lead time?**

   Lead-time is the time taken to receive the delivery after placing orders with the supplier. In other words, the number of days required to receive the inventory from the date of placing order. Lead time also called as procurement time of inventory.

   Minimum stock level = Re-order level – [Normal Usage x Average delivery time]

2. ***Reordering Level:*** Reorder level is that level of inventory at in weeks, which an order should be placed for replenishing the current stock of inventory. Generally, the reorder level lies between minimum stock level and maximum stock level.

   Re-order point = Lead time (in days) x Average Daily usage

   The above formula is based on the assumption that (a) Consistent daily usage, and (b) Fixed lead-time.

3. ***Safety Stock:*** Prediction of average daily usage and lead-time is difficult. Raw materials may vary from day-to-day or from week-to-week, it is in the case of lead-time also. Lead-time may be delayed, if the usage increases then the company faces problem of stock out. To avoid stock out firm may require to maintain safety stock.

   Formula (under uncertainty of usage and lead time)

   Re-order point = Lead time (in days) × Average usage + Safety stock

4. ***Maximum Level:*** Maximum level of stock, is that level of stock beyond which a firm should not maintain the stock. If the firm stocks inventory beyond the maximum stock level it is called as overstocking. Excess inventory (overstock) involves heavy cost of inventory, because it blocks firms funds in investment inventory, excess carrying cost, wastage, obsolescence, and theft cost. Hence, firm should not stock above the maximum stock level.

   Did u know? **What is Safety Stock?**

   Safety stock is that minimum additional inventory to serve as a safety margin or better or buffer or cushion to meet an unanticipated and increase in usage resulting from an unusually high demand and or an uncontrollable late receipt of incoming inventory.

   Maximum Stock Level = Reorder Level + Reorder Quantity - (Minimum Usage x Minimum Delivery Time)

Notes

Average Stock Level:

Average Stock Level = Minimum level + [Reorder Quantity ÷ 2]

5. ***Danger Stock Level:*** Danger level is that level of materials beyond which materials should not fall in any situation. When it falls in danger level it will disturb production. Hence, the firm should not allow the stock level to go to danger level, if at all falls in that level then immediately stock should be arranged even if it costly.

   Danger Level = Average Usage x Minimum Deliver Time [for emergency purchase]

Two-Bin Technique

It is the oldest techniques of inventory control. Generally, it is used to control 'C' category inventories. According to this technique, stock of each item is separated into two piles, bins or groups. First bin contains stock, just enough to last from the date a new order is placed until it is received for inventory. The second bin contains stock, which is enough to meet current demand over the period of replenishment. First stock is issued from first bin whenever the first bin is completed, then an order for replenishment is placed, and the stock in the second is utilized until the ordered material is received.

VED Classification

According to this classification, inventories are grouped based on the effect of production and inventories are grouped into three, they are Vital, Essential and Desirable inventories. It is specially used for classification of spare parts. If a part is vital, in production, then it is classified as 'V', if it is essential, then it is assigned 'E' and if it is not so essential, desirable that is given 'D'. 'V' category item are stocked high and category 'D' items are maintained at minimum level.

Just in Time (JIT)

Popularly known in its acronym JIT. JIT may be applied for either raw materials purchase or producing finished goods. From raw materials purchases it means that no inventories are held at any stage of production and the exact requirement is bought in each and every successive stage of production of the right time. In other words, maintenance of a minimum level of raw materials, where by the inventory carrying cost could be minimized, and the risk of loss due to stock-out position could be well avoided. From production of goods view, JIT means goods are produced only when the orders are received, there by no storage of finished goods, can avoid costs of carrying finished goods. JIT is also known as "Zero Inventory Production System" (ZIPS), Zero Inventories (ZIN), Materials as Needed (MAN), or Neck of Time (NOT).

Task The annual cash requirement of a company is ₹ 20 lakhs, firm has short-term marketable securities is lot size of ₹ 50,000; ₹ 1,00,000; ₹ 1,50,000; ₹ 2,00,000; ₹ 2,50,000; ₹ 5,00,000 and ₹ 5,50,000. The cost of conversion of marketable securities is ₹ 4,000 per lot. The company's opportunity cost is 6 per cent. Determine the economic lot size.

Notes

10.4 Summary

- Inventory management occupies the most significant position in the structure of working capital.
- Management of optimum level of inventory investment is the prime objective of inventory management.
- Inadequate or excess investment in inventories is not healthy by for any firm.
- The optimum level if investment in inventories lies between excess investment and inadequate investment.
- Economic Order Quantity (EOQ) [Order Quantity Problem] refers to that level of inventory at which the total cost of inventory is minimum.

10.5 Keywords

Economic Order Quantity (EOQ): It refers to that level of inventory at which the total cost of inventory is minimum.

Inventory: The stockpile of the products a firm is offering for sales and the components that make up the product.

Optimum Level of Inventory: It is the level where the total costs of inventory is less.

Raw Materials: It is the input that is converted into finished goods through a manufacturing or conversion process.

Work-in-progress: It is the stage of stocks between raw materials & finished goods.

10.6 Self Assessment

Fill in the blanks:

1. Inventory is one of components of ..... assets.
2. The term inventory is originated from the ....."Inventoried", and the Latin ....
3. Raw materials, work-in-process, finished goods and stores and spares are the components of .....
4. ..... motive necessitates the holiday of inventories for unexpected changes in demand and supply factors.
5. ..... are those costs that are associated with the acquisition of raw materials.
6. ..... are those costs that arise due to stock out, either shortage of raw materials or finished goods.
7. ..... refers to that level of inventory at which the total cost of inventory is minimum.

State whether the following statements are true or false:

8. Holding of inventories to take the advantages of changes in prices and getting quantity discounts are known as speculative motive.
9. Inventory carrying costs are those costs that are associated with the carrying of goods from supplies to the firm.

Notes

10. Price decline, product deterioration, and product obsolescence are the risks of holding inventory.

10.7 Review Questions

1. What is EOQ?
2. What is inventory management?
3. Name the three main components of inventory.
4. The Management of Shesha Sai Textiles has predicted sales of 1,00,000 units of a product in the next 12 months. The product cost is ₹18 per unit. Its estimated carrying cost is 25 per cent of inventory value and ordering cost is ₹10 per order. What is the EOQ ?
5. Bharath Engineering Factory consumes 3,00,000 units of a component per year. The ordering, receiving and handling costs are ₹ 60 per order and the firm is estimating its carrying cost at 20 per cent. Component cost per unit is ₹ 20. Calculate EOQ.
6. Finance Department of RRR Cement Company gathered the following information. You are required to compute EOQ, number of orders in a year, the time gap between the two orders and the total cost of ordering and carrying. Monthly usage 150 units, ordering cost ₹ 20, cost of purchase of the component ₹ 5 and carrying cost are 16 per cent.
7. From the following information of ABC Co, Ltd., calculate minimum, maximum and re-order stock levels.

   Minimum consumption – 300 units per day

   Maximum consumption – 400 units per day

   Normal consumption – 320 units per day

   Re-order period – 10-20 days

   Re-order quantity – 1,500 units

   Normal re-order period – 14 days.
8. A manufacturing company has an expected usage of 1,00,000 units of certain product during the next year. The cost of an order is ₹ 40 and carrying cost is ₹ 0.5 per unit for one year. Lead-time on an order is five days and company will keep a reserve supply of two days' usage. You are required to calculate (a) EOQ and (b) the Re-order point (assuming 250-day year).
9. A company received an order for 15,000 units at the rate of 1,000 units per order. The production cost per unit is ₹ 24 per unit – ₹ 10 for raw materials and ₹ 14 as overhead cost. It costs ₹ 1,500 to set up for one run of 1,000 units and inventory-carrying cost is 20 per cent of the production cost. Since the customer may buy at least 15,000 this year, the company would like to avoid making five different production runs. Determine most economic production run.
10. A wholesale fruit dealer sells 16,000 boxes of dry fruits during the year. The cost of placing an order is ₹ 500 and each box of dry fruit costs ₹ 2,000. The cost of carrying inventory is 20 per cent. Find out economic order quantity.

Notes

Answers: Self Assessment

1.	Current	2.	French, Inventariom
3.	Inventory	4.	Precautionary
5.	Ordering costs	6.	Shortage costs
7.	Economic order quantity	8.	True
9.	False	10.	True

10.8 Further Readings

Books

Chandra, P., *Financial Management - Theory and Practice*, New Delhi, Tata McGraw Hill Publishing Company Ltd., 2002, p. 3.

Sudhindra Bhat, *Financial Management*, New Delhi, Excel Books, 2008.

Van Horne, J.C. and Wachowicz, Jr, J.M., *Fundamentals of Financial Management*, New Delhi, Prentice Hall of India Pvt. Ltd., 1996, p. 2.

Online link

http://www.fei.org/

Notes

Unit 11: Cash Management

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Objectives

After studying this unit, you will be able to:

- Define meaning and objectives of cash management
- Discuss important aspects of cash management

Introduction

Cash is one of the components of current assets. It is a medium of exchange for purpose of goods and services and for discharging liabilities. Cash management is one of the key areas of working capital management as cash is both beginning and the end of working capital cycle-cash, inventories, receivables and cash. It is the most liquid asset and the basic input required to keep the business running on a continuous basis.

11.1 Concept of Cash Management

Efficient management of the inflow and outflow of cash plays a crucial role in the overall performance of a firm. Shortage of cash will disrupt the firm's manufacturing process while excess cash will remain idle without any contribution towards profit. Cash is not an end itself, but is a means to achieve the end. To quote Brigham, "Cash is a non-earning asset, so excessive cash balance simply lowers the total assets turnover, thereby reducing both the rate of return on net worth and the value of the stock." The steady and healthy circulation of cash throughout the entire business operation is the business solvency.

Notes

Therefore, effective management of cash involves an effort to minimise investment in cash without impairing to liquidity of the firm. It implies a proper balancing between the two conflicting objectives of the liquidity and profitability.

Notes

Nature of Cash

Cash is the medium of exchange for purchase of goods and services, and for discharging liabilities. In cash management the term cash has been used in two senses:

1. ***Narrow Sense:*** Under this cash covers currency and generally accepted equivalents of cash, viz., cheques, demand drafts and banks demand deposits.
2. ***Broad Sense:*** Here, cash includes not only the above stated but also cash assets. There are bank's time deposits and marketable securities. The marketable security can easily sold and converted into cash. Here, cash management is in broader sense.

11.2 Objectives of Cash Management

Following as the objectives of cash management:

1. ***To Meet Cash Payments:*** The prime objective of cash management is to meet various cash payments needed to pay in business operations. The payments are like payment to supplier of raw materials, payment of wages and salaries, payment of electricity bills, telephone bills and so on. Firm should maintain cash balances to meet the payments; otherwise it will not be able to run business. To quote Bollen, "Cash is an oil to lubricate the ever-turning wheels of business: without it, the process grinds to a stop". Hence, one of the cash management objectives is to meet the payments with the maintenance of sufficient cash.
2. ***To Maintain Minimum Cash Balance (Reserve):*** This is second important objective of cash management. It means the firm should not maintain excess cash balances. Excess cash balance may ensure prompt payment, but if the excess balance will remain idle, as cash is a non-earning asset and the firm will have to forego profits. On the other hand, maintenance of low level of cash balance may not help to pay the obligations. Hence, the aim of cash management is to maintain optimum cash balance.

Notes

Motives for Holding Cash

Cash is the most crucial component of the working capital of a firm, as every transaction results either in an inflow or outflow of cash. Cash has no earning power, then why does a firm need cash? John Maynard Keynes puts forth that there are three possible motives for holding cash.

1. ***The Transaction Motive:*** This motive arises due to the necessity of having cash for various disbursements like purchase of raw materials, payment of business expenses, payment of tax, payment of dividend and so on. The need to hold cash would not arise, if there is perfect synchronization between the cash receipts and the cash payments. Hence, the firm must have an adequate cash balance particularly when payments are in excess of receipts to meet its obligations. The requirement of cash to meet routine cash needs is known as the transaction motive and such motive refers to the holding of cash to meet anticipated obligations whose timing is not perfectly synchronized with each receipts. The transaction motive, thus, refers to the holding

Contd....

Notes

of cash to meet anticipated obligations whose timing is not perfectly synchronized with cash receipts.

2. ***The Precautionary Motive:*** Apart from the non-synchronization of anticipated cash flows in the ordinary course of business, firm may require cash for the payment of unexpected disbursements. The unexpected cash needs at short-notice may be the result of floods, strikes and failure of important customers, bills may be presented for settlement earlier than expected, slow down in collection of accounts receivables, sharp increase in cost of raw materials. It provides a cushion or buffer to withstand some unexpected emergency. The precautionary balance may be held in near-money assets like marketable securities. The amount set aside for precautionary motive is not expected to earn anything. As matter of abundant caution, many companies had learnt the art of 'cultivating the rich uncle', by establishing and maintaining good lasting link with progressive banking institutions. Ready borrowing power is the best antidote to emergency cash drains and facilities release available cash resources for remunerative applications.

3. ***The Speculative Motive:*** It refers to the desire of a firm to take advantage of opportunities, which present themselves at unexpected moments and that are typically outside the normal course of business. In simple words, it is a motive of holding cash relates for investing in profitable opportunities as and when they arise. In other words, this motive comes from a desire of holding cash to gain in speculative transactions such as, purchase of raw materials at reduced price on payment of immediate cash, dealing in commodities in bulk purchasing and selling when rates are considered favourable. Hence firms, which have such speculative dealings, may carry additional liquidity.

11.3 Aspects of Cash Management

The aspects or problems of cash management can be examined under three heads, such as:

1. Cash inflows and outflows,
2. Cash flow within the firm, and
3. Cash balances held at the point of time.

Cash inflows (receipts) and outflows (payments) may not match, they may be excess or less over cash outflows. Surplus cash arise when the cash inflows are excess over cash outflows and deficit will arise when the cash inflows are less than the cash outflows. The balance known as synchronisation firm should develop appropriate strategies for resolving the uncertainty involved in cash flow prediction and in balance between cash receipts and payments. Firm has to come up with some cash management strategies regarding the following four facets of cash management.

1. ***Cash Planning:*** Cash planning is required to estimate the cash surplus or deficit for each planning period. Estimation of cash surplus or deficit can be arrived by preparation of cash budget.

2. ***Cash Flows Management:*** Cash flows means cash inflows and cash outflows. The cash flows should be properly managed that the cash inflows should be accelerated (collected as early as possible) and cash outflows should be decelerated (cash payments should be delayed without affecting firm name).

3. ***Determination of Optimum Cash Balance:*** Optimum cash balance is that balance at which the cost of excess cash and danger of cash deficiency will match. In other words, it is the cash balance at that the total cost (total cost equals to transaction cost and opportunity cost) is minimum. Firm has to determine optimum cash balance.

Notes

4. ***Investment of Surplus Cash:*** Whenever there is surplus cash it should be properly invested in marketable securities, to earn profits. Firms should not invest in long-term securities; they cannot be converted into cash within a short period.

11.4 Cash Planning or Cash Budget

Cash planning and control of cash is the central point of finance functions. Maintenance of adequate cash is one of the prime responsibilities of financial manager. It is possible only through preparation of cash planning.

Cash control is also included in cash planning. Since planning and control are the twins of management. Cash planning is a technique to plan and control the use of cash.

Cash Forecasting and Budgeting

Cash forecast is used as a method to predict future cash flow because it deals with the estimation of cash flows (i.e., cash in flows and cash outflows) at different stages and offers the management an advance notice to take appropriate and timely action.

Cash budget is an important tool for the flow of cash in any firm over a future period of time. In other words, it is a statement showing the estimated cash inflows and cash outflows over a planning period. It pinpoints the surplus or deficit cash of a firm as it moves from one period to another period. The surplus of deficit data helps the financial manager to determine the future cash needs of the firm, plan for the financing of those needs and exercise control over the cash and liquidity of the firm. Cash budget is also known as short-term cash forecasting.

Notes

Steps Involved in Preparation of Cash Budget

Preparation of cash budget involves the following steps:

Step 1: Selection of period of time (planning horizon): Planning horizon is that period for which cash budget is prepared. There are no fixed rules for cash budget preparation. Planning horizon of a cash budget may differ from firm to firm, depending upon the size of the firm. Cash budget period should not be too short or too long.

Step 2: Selection of factor that has bearing on cash flows: The factors that generate cash flows are divided into two broad categories. (a) Operating, and (b) Financial.

1. ***Operating Cash Flows:*** Operating cash inflows are cash sales, collection of accounts receivables and disposal of fixed assets and the operating cash outflows are bills payables, purchase of raw materials, wages, factory expenses, administrative expenses, maintenance expenses and purchase of fixed assets.
2. ***Financial Cash Flows:*** Loans and borrowings, sale of securities, dividend received, refund of tax, rent received, interest received and issue of new shares and debentures cash outflows are redemption of loan, repurchase of shares, income tax payments, interest paid and dividend paid.

Notes

Illustration 1: From the following information prepare cash budget for VSI Co. Ltd.:

Particulars		Jan	Feb	March	April
Opening cash balance		20,000			
Collection from customer		1,30,000	1,60,000	1,65,000	2,30,000
Payments:					
	Raw materials purchase	25,000	45,000	40,000	63,200
	Salary and wages	1,00,000	1,05,000	1,00,000	1,14,200
	Other expenses	15,000	10,000	15,000	12,000
	Income tax	6,000	----	----	----
	Machinery	----	----	20,000	----

The firm wants to maintain a minimum cash balance of ₹ 25,000 for each month. Creditors are allowed one-month credit. There is no lag in payment of salary, other expenses.

Solution:

Cash budget for the period Jan to April (₹)

Particulars		Jan	Feb	March	April
Opening cash balance		20,000	29,000	49,000	34,000
Cash collection from customer		1,30,000	1,60,000	1,65,000	2,30,000
(A) Total receipts		1,50,000	1,89,000	2,14,000	2,64,000
Payments :					
	Raw materials	----	25,000	45,000	40,000
	Salary	1,00,000	1,05,000	1,00,000	1,14,200
	Other expenses	15,000	10,000	15,000	12,000
	Income tax	6,000	----	----	----
	Machinery	----	----	20,000	----
(B) Total payments		1,21,000	1,40,000	1,80,000	1,66,200
Closing Balance (A – B)		29,000	49,000	34,000	97,800

11.5 Managing Cash Flows

After estimation of cash flows, then the next financial manager's job is to ensure that there should not be more deviation between the projected cash flows and the actual cash flows, for that efficient cash management is must. That financial manager will have the control on collection of receipts and cash disbursements. As the objectives of cash management is to accelerate cash receipts as much as possible and decelerate or delay cash payments as much as possible. In other words, the various collection and disbursement methods can be employed to improve cash management efficiently constitutes two sides of the same coin. Both collections and disbursements exercise a joint impact on the overall efficiency of cash management. The idea is that speed collection of accounts receivables so that the firm can use money sooner; otherwise, it has to borrow money, wherein costs are involved. Conversely, firm wants to pay accounts payables late without affecting credit standing with suppliers, so that firm can make use of the money it already has. Hence, for efficient cash management firm has (A) to collect accounts receivables as early as possible, and (B) it has to delay the accounts payables without affecting credit standing.

11.6 Computation of Optimum Cash Balance

A firm has to maintain optimum cash balance. Optimal cash balance is that cash balance where the firm's opportunity cost equals to transaction cost and the total cost are minimum. Then how to determine optimum cash balance?

Notes

Optimum cash balance can be determined by a number of mathematical models. But here the most important two models are discussed. They are:

1. Baumol Model (Inventory Model)
2. Miller—Orr Model (Statistical Model)

11.6.1 Baumol Model

This model was developed by Baumol. This model is suitable only when the cost flows are predictable (under certainty). It considers optimum cash balance similar to the economic order quantity, since it is based on EOQ Concept and also in both the cases there is trade off between cost of borrowing (sale of securities cost) and opportunity the cost. The point where the total cost is minimum. Figure shows Baumol model.

Caution Baumol model is based on the following assumptions:

The firm knows its cash needs with certainty.

1. The cash payment (disbursement) of the firm occurs uniformly over a period of time and is known with certainty.
2. The opportunity cost of holding cash is known and it remains stable over time.
3. The transaction cost is known and remains stable.

Elements of Total Cost

The total cost associated with management of cash under this model involves two elements (a) Conversion cost (transaction cost) and (b) Opportunity cost (interest cost).

1. ***Conversion Cost (Transaction cost):*** Conversion costs are those costs that are associated with sale of marketable security and raise whenever firm converts marketable security into cash. Conversion Cost (C) = C [F/M]

   Where, C = Cost per conversion;

   F = Expected cash need for future period

   M = Amount of marketable securities sold in each sale.

2. ***Opportunity Cost:*** Is the (cost benefit) foregone by holding idle cash. In other words, opportunity cost is the interest forgone on an average cash balance. Symbolically,

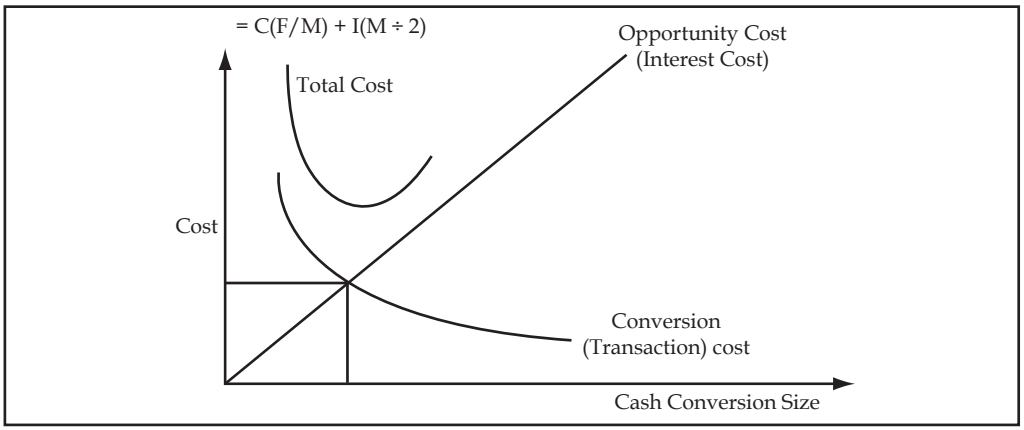
   Opportunity cost (O) = I (M ÷ 2)

   Where, I = Interest rate that could have been earned

   M ÷ 2 = Average can balance [(Opening cash + Closing cash)/2]

   Total cost = Conversion cost + Opportunity cost

Notes



Economical (optimal) Conversion lot size:

$$ECL = \sqrt{\frac{2CF}{O}}$$

Where,

ECL = Economic Conversion Lot; F = Expected cash needed for future period

C = Cost per conversion; O = Opportunity cost

Illustration 2: VS International Coy Ltd., estimated cash needs of ₹ 20 lakhs for a year. Cost of transaction of marketable securities is ₹ 2000 per lot. The company has marketable securities in lot sizes of ₹ 1,00,000, ₹ 2,00,000, ₹ 4,00,000, ₹ 5,00,000 and ₹ 10,00,000. Determine economic conversion lot size if 20% is the opportunity cost.

Solution:

$$ECL = \sqrt{\frac{2 \times 2000 \times 20,00,000}{0.20}} = ₹2,00,000$$

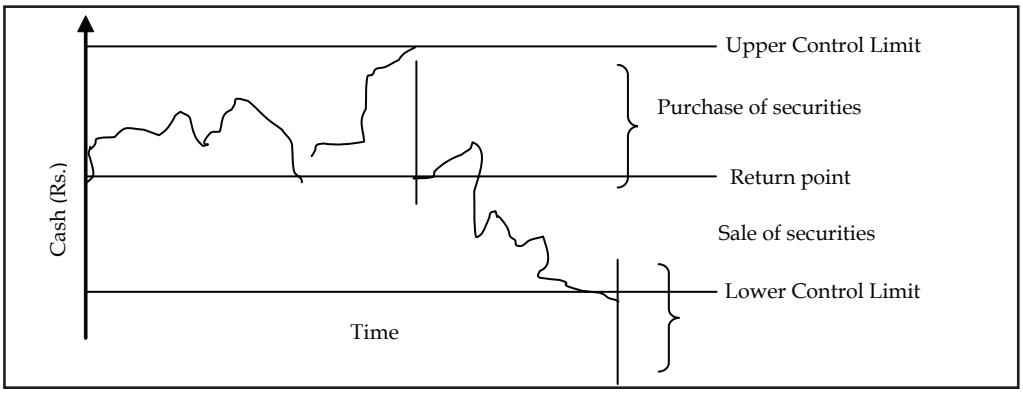
11.6.2 Miller and ORR Model

The Miller and ORR model is in fact an attempt to make Baumol model more elastic with regards to the pattern of periodic changes in cash balances. Baumol's model is based on the assumption that uniform and certain level of cash balances. But in practice firms do not use uniform cash balances nor are they able to predict daily cash inflows and outflows. The Miller ORR Model overcomes the limitations of Baumol model. It's augmented on the Baumol Model and came out of a statistical model. That is useful for the firms with uncertain cash flows. The Miller and ORR model provides two control limits—the upper control limit and the lower control limit along with a return point. The following figure shows the two control limits and return point.

According to this model, cash balance fluctuates between LCL and UCL. Whenever, cash balance touches UCL then the firm purchases sufficient (UCL - RP) marketable securities to take bank cash balance to return point. On the other hand when the firm touches the lower control limit, it will sell the marketable securities to the extent of (RP - LCL), take back cash balance to return point.

The cash balance at the lower control limit (LCL) is set by the firm as per requirement of maintaining minimum cash balance. The cash balances at upper control limit (UCL) and record points will be determined on the basis of the transaction cost (C), the interest rate (O) and standard deviation (σ) of net cash flows.

Notes



The following formula is used to determine the spread between UCL and LCL (called Z) as per MO model.

$$Z(RP) = \sqrt[3]{\frac{3C\sigma^2}{4O}} + LCL \; or \left(\frac{3}{4} \times \frac{C\sigma^2}{O}\right)^{1/3} + LCL$$

Where,

Z = Control limit of cash balance (or) return point

C = Transaction cost

σ = Variance of net cash flow

LCL = Lower control limit

O = Opportunity cost or interest rate earned on marketable security

Case Study

Bajaj Electronics: Cash Forecasting

This case tests the reader's ability to develop a basic cash forecast for a firm and prepare a recommendation for backup financing over a period of 12 months.

A leading producer of telecommunications components and a major contender in shorter antennas is Bajaj Electronics Company. Bajaj's business has grown tremendously in recent years despite increased competition. The primary reasons for increased growth are technological advancement that have expanded production capacity, an aggressive marketing effort, and a reputation for quality products and excellent service.

Loofer the financial analyst for the company, has been assigned the task of preparing a quarterly cash forecast for the next fiscal year. After checking with marketing, he was given a monthly breakdown of actual sales for last month and the current month and the current month and a forecast for the next 12 months. These are given in Table 1 and reflect the somewhat seasonal nature of the firm's marketing activities.

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Table 1: Actual and Forecast Sales from Marketing

Month	Actual Credit Sales	Forecast Sales
November	$ 4,338,000	
December	5,204,000	
January		$ 4,600,000
February		4,500,000
March		4,500,000
April		52,00, 000
May		5, 000, 000
June		4,700, 000
July		6, 000, 000
August		6,000,000
September		5,800,000
October		4,500,000
November		4,600,000
December		4,600,000

From the accounting department, Loofer obtained information on the historical mix of sales and collection information. During the first half of the year, credit sales generally mad up about 80 per cent of all sales. In the second half, this dropped to 75 per cent. With respect to the credit sales, collection patterns varied seasonally. This information is contained in Table 2 Once again, the collection pattern is also seasonal Note, however, that the collections do not total to 100 per cent of credit sales. This is the case because the firm allows a margin for bad debts and unexpected collection costs.

The firm follows a unique and highly controlled system for its trade payables. Each month during the first half of the year, the accounts payable section pays suppliers cash equal to 50 per cent of the monthly sales. During the second half of the year, this rises to 55 per cent. Over a full year, this pattern of payment seems to be adequate to pay all bills. At times, suppliers are pressing for more payments and some maneuvering is needed. Still, this policy assists the firm's cash management during the busy third quarter and will be followed next year.

Cash operating expenses are paid as they occur. During the first and fourth quarters, they are estimated at 50 per cent of sales. During the second and third quarters, they rise to 55 per cent of sales.

Loofer knows that the firm includes the impact of interest and taxes in its operating cash flow forecasts. The levels of such debt, along with the forecasted average interest rate for each month, are given in Table 3. Interest will be calculated to reflect changes in debt levels.

The firm pays estimated tax payments monthly at a 35 per cent rate. It uses a cost of goods sold estimate at 50 per cent of sales, not including depreciation. Loofer assumes that monthly depreciation for the next year will be $ 185,000.

Table 2: Collection Pattern of Receivables

		Percent of Credit Sales	
Months	**Collected in Same Month**	**Collected One Month Later**	**Collected Two Months Later**
November	0.20		
December	0.60	0.15	

Contd...

Notes

January	0.20	0.60	0.15
February	0.30	0.60	0.50
March	0.25	0.60	0.10
April	0.25	0.60	0.10
May	0.15	0.60	0.20
June	0.20	0.60	0.15
July	0.10	0.60	0.25
August	0.20	0.60	0.15
September	0.15	0.60	0.20
October	0.20	0.60	0.15
November	0.15	0.60	
December	0.10		

Debt Forecast, Last Day of Each Month, and Average Monthly Interest Rates

Months	Interest-Bearing Debt (,000s)	Interest Rate
December	1600	
January	1800	0.120
February	1500	0.100
March	1600	0.110
April	1500	0.100
May	1600	0.110
June	1500	0.100
July	1500	0.090
August	1400	0.080
September	1300	0.090
October	1400	0.080
November	1200	0.095
December	1600	0.095

The final information for the forecast involves establishing a safety level. The firm requires cash or equivalents equal to 20 per cent of the monthly cash operating expenses. The firm began the year with $6,10,000 in the form of cash and equivalents.

Question

Prepare a statement showing cash forecast for the next 12 months, and in case where firm needs additional cash, draw the recommendation with the tune of credit that must be arranged from bank.

11.7 Summary

- Cash management is one of the key areas of working capital management as cash is both beginning and the end of working capital cycle-cash, inventories, receivables and cash.
- It is the most liquid asset and the basic input required to keep the business running on a continuous basis.
- Efficient management of cash involves an effort to minimise investment in cash without impairing to liquidity of the firm.
- Objectives of cash management are to meet cash payment needs; and to maintain minimum cash balance.
- Cash planning is a technique to plan and control the use of cash.

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- A projected cash flow statement prepared based on expected cash receipts and payments, anticipation the financial condition of the firm.
- Cash budget is a statement showing the estimated cash inflows and cash outflows over a planning period.

11.8 Keywords

Cash Budget: It is a statement showing the estimated cash inflows and cash outflows over a planning period.

Cash Planning: It is a technique to plan and control the use of cash.

Cash: It is one of the components of current assets and a medium of exchange for the purpose of transactions.

Money Market: It refers to the market for short-term securities.

11.9 Self Assessment

Fill in the blanks:

1. Cash is one of the components of ..... .
2. Cash is the most ..... asset.
3. The two types of cash forecasting are ..... and ..... .
4. Surplus cash is ..... .
5. ..... is required to estimate the cash surplus or deficit for each planning period.
6. .....is that balance at which the cost of excess cash and danger of cash deficiency will match.

State whether the following statements are true or false:

7. There is no time gap between cash inflows and outflows.
8. The time taken by post offices in transferring the cheques from the customer to the firm is referred to as postal float.
9. There are four motives for holding cash.
10. Conversion cost is the cost of converting securities into cash.

11.10 Review Questions

1. ABC Ltd., estimates its total cash requirement as ₹ 5 crore in the next year. ₹ 300 is the conversion cost of securities in cash on which the firm was earning 15 per cent interest per annum. Determining the optimum cash balance.
2. Best of Luck Co. Ltd., firm estimated its total cash requirements of ₹ 2,00,000 for next six months. The firm has to spend ₹ 200 as conversion cost, if it wants to convert its securities into cash. The firm has 10 per cent securities. What is the economic conversion size of cash. Assume the firm has securities in the lot sizes of ₹ 20,000, ₹ 40,000, ₹ 60,000, ₹ 80,000 and ₹ 1,00,000.

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3. Venkat & Co., expects its cash flow to behave in a random manner, as it was assumed by Miller Orr model. Venkat & Co. requested you to set an UCL and RP, with the following information. The management of firm would like to maintain a minimum cash balance of ₹ 70,000. The standard deviation its daily cash balances in ₹ 7,000. Firm earns a 12 per cent yield on its short-term marketable securities. Conversion of securities into cash is net cost free it involves ₹ 120 (Assume 366 days a year).
4. How do you determining optimum level of cash balances? How does uncertainty of cash balance affects this problem?
5. "Management of cash flows plays a very important role in cash management". Discuss.
6. Briefly discuss the various avenues or opportunities available to the companies to park their surplus funds for a short-term.
7. Efficient cash management will aim at maximizing the cash inflows and slowing cash outflows". Discuss.
8. "Cash budgeting or short-term cash forecasting (budgeting) is the principal tool of cash management." Discuss.
9. What represents the optimal cash balance for a firm?
10. What do you understand by Badla financing?

Answers: Self Assessment

1.	Current assets	2.	Liquid
3.	Short-term, Long-term	4.	Unproductive
5.	Cash planning	6.	Optimum cash balance
7.	False	8.	True
9.	False	10.	True

11.11 Further Readings

Books

Chandra, P., *Financial Management - Theory and Practice*, New Delhi, Tata McGraw Hill Publishing Company Ltd., 2002, p. 3.

Sudhindra Bhat, *Financial Management*, New Delhi, Excel Books, 2008.

Van Horne, J.C. and Wachowicz, Jr, J.M., *Fundamentals of Financial Management*, New Delhi, Prentice Hall of India Pvt. Ltd., 1996, p. 2.

Online link

http://www.fei.org/

Unit 12: Dividend Policy

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Objectives

After studying this unit, you will be able to:

- Define meaning of dividend policy
- Discuss determinants of dividend policy

Introduction

Finance is the life-blood of business, without which a firm cannot promote, maintain and expand and achieve its predetermined objective. Whether it is big, medium or small it needs finance. Profit is the primary motivating force for any economic activity, a business enterprise essentially being an economic organization, it has to maximise the welfare of its stakeholders. To this end, the business undertaking has to earn profit from its operations. Profit is the excess of revenue over expenses on conducting operations. In fact, profits are useful intermediate beacon towards which a firm's capital should be directed. In this connection McAlpine rightly remarked that profit cannot be ignored since it is both, a measure of the success of business and the means of its survival and growth.

Certainly, profit growth coupled with high level of profit and the ability to maintain reasonable profit will help towards:

1. Ensuring that shareholders receive an adequate dividend;
2. Preserving the assets worth of the business;
3. Generating a sufficient cash flow out of profits to provide capital for expansion; and

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4. Providing funds for research, and development of new and improved products to replace the existing products before they decline.

12.1 Meaning of Dividend Policy

The term 'dividend' refers to that portion of company's net earnings that is paid out to the equity shareholders (not for preference shareholders, since they are entitled to have a fixed rate of dividend). Dividend policy of a firm decides the portion of earnings is to be paid as dividends to ordinary shareholders and the portion that is ploughed back in the firm for investment purpose. The total net earnings of equity may be paid as dividends (100% dividend payout ratio), which may consequently result in slower growth and lower market price or a part of net earnings may be paid as dividends, higher capital gains and higher market price. When a company uses a part of its net earnings for dividend payments then, the remaining earnings are retained.

Did u know? Net earnings = Operating Profit - (Interest + Tax + Preference Dividend)

Hence, the alternative use of net earnings or net profit dividends and retained earnings are competitive and conflicting.

12.2 Types of Dividend Policies

Dividend decision of a firm is taken after taking into consideration, its operating and financial condition. When there are variations in these conditions the firm may require to adopt the one that is suitable for the present conditions. What are the different types of dividend policies available to the financial manager? The types of dividend policies are as follows:

12.2.1 Stable Dividend Policy

The term "stability" refers to the consistency or lack of variability in the stream of dividend payments. In more precise terms, stable dividend means payment of a certain minimum amount of dividend regularly. There are three distinct forms of stability, they are:

1. ***Constant Dividend Per Share:*** A company that follows this policy will pay a fixed amount per share as dividend. For example ₹ 2 as a dividend on the face value of share of ₹ 10 each. The level of earnings would not affect this policy or the dividend payments. This type of dividend policy is more suitable for the company whose earnings are stable over a number of years. Stability of dividend does not mean stagnation in dividend payout. In fact, the prime feature of this policy is to study positive change.

2. ***Constant Payout Ratio:*** The ratio of dividend to earnings is known as payout ratio. In other words, dividend per share is divided by earnings per share to get dividend payout ratio. It is also known as constant percentage of net earnings. In this policy a fixed percentage of earnings are paid as dividends each year. Here the ratio is fixed or constant, but dividend per share varies according to the fluctuations in the earnings.

Example: It a company follows a 30 per cent payout ratio it means for every one rupee of net earnings, ₹ 0.30 ,paid as dividends. Assume if a company earned ₹ 10 last year and ₹ 15 in the current year. Then the dividend amount for last year is ₹ 3 (10 x 30/100) and ₹ 4.5 (15 x 30/100) for the current year. The relationship between EPS and DPS is shown in figure 12.1.

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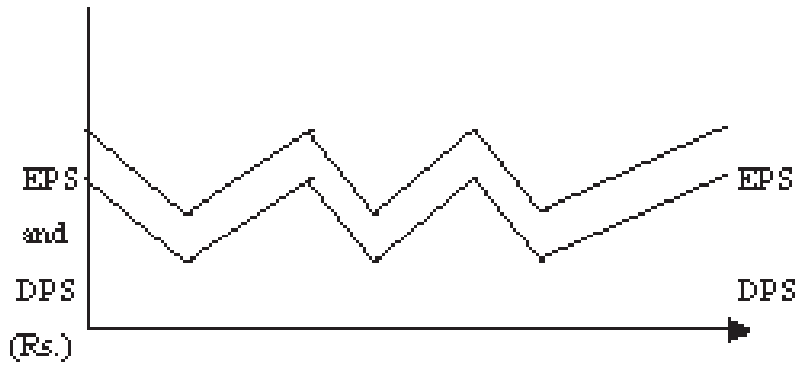
Figure 12.1



This policy is suitable for a company that is not confident getting stable earnings.

3. ***Stable Rupee Dividend Plus Extra Dividend:*** Under this policy the management fixes the minimum dividend per share to reduce the possibility of net paying dividend. An extra dividend is paid in the years of prosperity. This type of policy is more suitable to the company having minimum earnings and over the minimum, the earnings may fluctuate.

Advantages of Stable Dividend Policy

A stable dividend policy is advantageous for both the company and the shareholders because:

1. ***Building Confidence Among Investors:*** Payment of stable dividends may help the company in creating and building confidence among shareholders with regard to regularity. A company that follows stable dividend policy will not change the amount of dividends, even though there are any variations in its earnings. Thus, when the earnings of a firm go down, the company does not cut the amount of dividend. But to its presents investors, a very bright future, and thus, gains confidence of the shareholders.

2. ***Investors Desire for Current Income:*** A company may have many investor categories, of them a few groups of investors depend on dividend income to meet their portion of living expenses. Investor group may include old and retired persons etc., who require the current income. Their living expenses are fairly stable from the period to period increase over time. Therefore, sharp changes in dividend income may create a need to sell shares to get funds in order to meet current expenses and vice versa. Sale of securities involves inconvenience and it involves transaction costs. Stable dividend policy avoids sale of securities, which automatically avoids inconvenience and transaction cost, hence, such investors may prefer stable dividends.

3. ***Information about Firms Profitability:*** There is another reason for adopting a stable dividend policy that is, investors are thought to use dividends and the fluctuation in dividends as a source of information about the company's profitability. A growth in dividends indicates improved earnings prospects, a downward trend in dividends implies less earnings and stable dividends means unchanged prospects. In other words, the dividend decision of a firm resolves uncertainty in the minds of investors. Variation in dividend policy cannot resolve uncertainty in the investor minds. Hence, companies may tries to change dividend policy in response to a certain long-term changes in future prospects.

4. ***Institutional Investors Requirements:*** Companies shares are not only purchased by individuals but also institutional investors like LIC companies, GIC's, MF's, educational

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institutes and social institutes. Normally, companies are very much interested to have these institutional investors in the list of their investors. Generally, this type of institutional investors have large size of their ingestible funds, these funds will be invested in the shares of those companies that have the record of paying stable dividends. So, to attract institutional investors a firm may prefer to adopt a regular or stable dividend policy.

5. ***Raising Additional Finances:*** This is another advantage to the company that is following a stable dividend policy, in raising external finance. Shares of this type of company appear as investment rather than a speculation. Investors, who invest in this type of company's shares hold them for a long period of time and their loyalty and goodwill towards the firm increase by adoption of stable dividend policy. If the company wants to raise additional funds by issuing shares to the public, they would be more receptive to that offer. For example recently in beginning of the year 2004, the public issue of ONGC, ICICI, IPTCL, GAIL are over subscribed. Thus, rising of additional funds required by the firm becomes very easy, even with high premium.

Limitations of Stable Dividend Policy

In spite of the above discussed advantages the stable dividend policy suffers from certain limitations. They are:

1. ***Difficult to Change:*** Once a stable dividend policy is established, it cannot be changed without affecting investors' attitude and financial position of the company, in the minds of investor.
2. ***Adverse Effect on Market Price of Share:*** As we have discussed in the advantages, about the investors desire for current income to meet their living expenses, the investors who prefer or depend on stable dividends, may feel bad, when the firm cuts dividend, consequently they may sell some of their shares to fulfill the gap between expected dividend and the actual dividend received (negative dividend. This leads to the reduction in the share price. Hence, directors have to maintain stability in dividends, in lean years.
3. ***Long-Run Effect on Company:*** When a firm maintains stable dividend policy in lean years over a period of time with borrowed funds it may lead to death in the long-run.

12.2.2 Irregular Dividend Policy

Some companies follow irregular dividend payments on account of the following:

1. Uncertainty of earnings.
2. Unsuccessful business operations.
3. Lack of liquid resources.
4. Fear of adverse effects of regular dividends on the financial standing of the company.

12.2.3 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.

12.2.4 Residual Dividend Policy

When new equity is raised floatation costs are involved. This makes new equity costlier than retained earnings. Under the Residual approach, dividends are paid out of profits after making provision for money required to meet upcoming capital expenditure commitments.

12.3 Determinants of Dividend Policy

Notes

The following are the various factors that have a bearing on the dividend policy:

1. ***Nature of Business:*** The nature of business has an important bearing on the dividend policy.

Example: The industrial units that are having stability of earnings may formulate (adopt) stable or a more consistent dividend policy than other that are having unstable earnings, because they can predict easily their earnings. Firms that are involved in necessities suffer less from stable incomes than the firms that are involved in luxury goods.

2. ***Age of Company:*** The age of company has more impact on distribution of profits as dividends. A newly started and growing company may require much of its earnings for financing expansion programs or growth requirements and it may follow rigid dividend policy.

3. ***Liquidity Position of Company:*** Generally dividends are paid in the form of cash, hence, it entails, cash. Although, a firm may have sufficient profits to declare dividends, but it may not have sufficient cash to pay dividends. Thus, availability of cash and sound financial position of the firm is an important factor in taking dividend decision.

4. ***Equity Shareholders Preference for Current Income:*** Legally, the Board of Directors has discretion to decide the distribution of the earnings of a firm. The shareholders who are legal owners of the firm appoint the (BOD's). Hence, directors have to take into consideration owners' preferences, while deciding dividend payment.

5. ***Legal Rules:*** Legal rules restrictions are significant as they provide framework within which dividend policy is formulated. In other words, dividend policy of a firm has to be evolved within the legal framework and rules and regulations. The legal rules have to do with capital impairment rule, net profits and insolvency rule.

Example: The dividend can be paid from earnings either from current years earnings or from past years earnings and be reflected in the earned surplus.

6. ***Financial Needs of the Company:*** This is one of the key factors, which influence the dividend policy of a firm. Financial needs means funds required for foreseeable future investment.

7. ***Access to the Capital Market (External Sources):*** Access to the capital market means the firms ability to raise funds from the capital market. A company, which has easy access to the capital market provides that flexibility in deciding dividend policy. Easy access is possible only to the companies that are well established and hence here a profit track record.

8. ***Control Objective:*** Control over the company is also an important factor, which influences dividend policy. When a firm distributes more earning as dividends in the form of cash it reduces its cash position. As a result, the firm will have to issue shares to the public to raise funds required to finance investment opportunities that leads to loss of control, since, the existing shareholders will have to share control with new owners. Financing investment projects by way of internal source avoids, loss of control.

9. ***Inflation:*** Inflation is the state of economy in which the prices of products or goods have been increasing. Inflation is a factor that influences dividend policy indirectly. Indian accounting system is based on historical costs. The funds accumulated from depreciation may not be sufficient to replace the absolute asset or equipment, since depreciation is provided based on historical costs. Consequently, to replace assets and equipment, firm has to depend upon retained earnings, this leads to the payment of low dividend, during inflation period.

Notes

10. ***Dividend Policy of Competitors:*** Keeping one eye on competitors' dividend policy is very important. If the firm wants to retain the existing shareholders or it want to maintain share price in the market, and if it is planning to raise funds from public for expansion programs, it has to pay dividends at par with its competitors. Hence, it is one of the factors that influence dividend policy of a firm.

12.4 Summary

- The term 'dividend' refers to that portion of company's net earnings that is paid out to the equity shareholders (not for preference shareholders, since they are entitled to have a fixed rate of dividend).
- Dividend policy of a firm decides the portion of earnings to be paid as dividends to ordinary shareholders and what portion is ploughed back in the firm for investment purpose.
- Payment of dividend through issue of bonus share is a financial gimmick, since it will not affect the owners' wealth.
- Stock dividend is advantages for company and the owners.
- Stock dividend is also beneficial to owners by tax savings, indication of future benefits, psychological value.

12.5 Keywords

Dividends: It refers to that portion of company's net earnings that is paid out to the equity shareholders.

Dividend Policy: It decides the portion of earnings to be paid as dividends to ordinary shareholders and what portion is ploughed back in the firm for investment purpose.

Payout Ratio: The ratio of dividend to earnings is known as payout ratio.

Stability: It refers to the consistency or lack of variability in the stream of dividend payments.

12.6 Self Assessment

Fill in the blanks:

1. Dividend refers to that portion of companies ..... that are paid out to the equity shareholders.
2. Distribution of profits between dividends and retained earnings affects the ..... of the firm.
3. Dividend policy of a firm affects both ..... and owners' wealth.
4. Investors' desire for current income is one of the advantages of ..... policy.
5. Making share trading attractive is one of the reasons of .....

State whether the following statement are true or false:

6. Dividend decision involves legal as well as financial considerations.
7. Capital impairment rule says that dividends can be paid from capital.
8. Sec 205 of the Companies Act says that dividends can be declared only from current years profits or from past reserves after providing depreciation.

Notes

9. Payment of dividend is prohibited when the firm is insolvent.
10. There is no relation between financing decisions and dividend decision.

12.7 Review Questions

1. 'Payment of dividend involves legal considerations' - Discuss.
2. Explain the factors that influence the dividend policy of a company.
3. Is there any relation between the dividend policy and value of a form? Give suggestions with some live market examples.
4. Briefly discuss the legal and procedural aspects of dividends according to company's law.
5. Discuss the dividend procedural aspects.
6. Inflation is a factor that influences dividend policy indirectly. How?
7. Why companies go for no divided policy?
8. A stable dividend policy is advantageous for both the company and the shareholders. Discuss.
9. The age of company has more impact on distribution of profits as dividends. Give some suggestions in support of the above statement.
10. Illustrate constant payout ratio with suitable example.

Answers: Self Assessment

1.	Net earnings	2.	value
3.	Long-term finance	4.	Stable dividend
5.	Stock split	6.	True
7.	False	8.	True
9.	True	10.	False

12.8 Further Readings

Books

Chandra, P. *Financial Management - Theory and Practice*, New Delhi, Tata McGraw-Hill Publishing Company Ltd., 2002, p. 3.

Sudhindra Bhat, *Financial Management,* New Delhi, Excel Books, 2008

Van Horne, J.C. and Wachowicz, Jr, J.M., *Fundamentals of Financial Management,* New Delhi, Prentice Hall of India Pvt. Ltd., 1996. p. 2.

Online links

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www.globusz.com

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Unit 13: Theory and Forms of Dividend

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13.2 Forms of Dividend

13.3 Summary

13.4 Keywords

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13.7 Further Readings

Objectives

After studying this unit, you will be able to:

- Discuss theories of dividend
- Explain forms of dividend

Introduction

If the choice of the dividend policy affects the value of a firm, it is considered as relevant. In that case a change in the dividend payout ratio will be followed by a change in the market value of the firm. If the dividend is relevant there must be an optimum payout ratio. If the dividend is irrelevant, there must be an optimum payout ratio.

Did u know? **What is optimum payout ratio?**

Optimum payout ratio is that which gives highest market value per share.

13.1 Theories of Dividend

13.1.1 Walter's Model (Relevant)

Prof. James E Walter argues that the choice of dividend payout ratio almost always affects the value of the firm Prof. Walter has very scholarly studied the significance of the relationship between internal rate of return (R) and cost of capital (K) in determining optimum dividend policy which maximizes the wealth of shareholders.

Notes

Walters models is based on the following assumptions

1. The firm finances its entire investments by means of retained earning only.
2. Internal rate or return (R) and cost of capital (K) of the firm remains constant.
3. The firms earning are either distributed as dividend or reinvested internally.
4. Beginning earnings and dividends of the firm will never change.
5. The firm has a very long or infinite life.

$$P = \frac{D + r/k(E - D)}{K}$$

P = Market price per share.

D = Dividend per share

E = Earning per share

R = Interest rate per capital

K = Cost of capital.

According to the theory, the optimum dividend policy depends on the relationship between the firm's internal rate of return and cost of capital. If R>K , the firms should retain the entire earnings.

Notes Walter's view on optimum dividend payout ratio can be summarized as below:

1. ***Growth Firms: (R>K):*** The firms having R>K may be referred to as growth opportunities. These firms naturally can earn a return which is more than what shareholders could earn on their own. So optimum payout ratio for growth firm is 0%.
2. ***Normal Firms (R = K):*** If R is equal to K the firm is known as normal firm. These firms earn a rate of return which is equal to that of shareholders in this case dividend policy will not have any influence on the price per share. So there is nothing like optimum payout ratio for a normal firm. All the payout ratios are optimum.
3. ***Declining Firms (R<K):*** If the company earns a return which is less than, what the shareholders can earn on their investments, it is known as declining firm. Here it should not make any sense to retain the earnings. So entire earnings optimum payout ratio for a declining firms is 100%.

So according to walter the optimum payout ratio is either 0% (when R>K) or 100% (when R<K).

Criticisms

Walter's model based on certain assumptions, which are true for Walter but not true in the real world. The following are the limitations of the Walter's model.

1. Walter assumes that there is no external financing. When R>K , the firm must issue additional security and finance its profitable investments, if the company uses only retained earnings, all the profitable investments cannot be undertaken. So the investment decision of the firm will be sub-optimum.

Notes

2. Constant R, Internal rate of return cannot remain same. It actually diminishes as and when we make more and more investments.

3. Constant K, Cost of capital of a company cannot remain same. Risk of the company definitely changes with additional investments of retained earnings.

Illustration 1: Given the following information about Sunrise Industries Ltd. Show the effect of the dividend policy on the market price per share, using Walter's model.

EPS = ₹8

Cost of capital (K) = 12%

Assumed rate of return

1. 15%

2. 10%

3. 12%

Solution:

To show the effect of different dividend policies on the shareholders of the firm for 15% and 12%, let us consider 0%, 25%, 50%, 75% and 100% payout ratios.

I when R>K (15>12)

At 0% payout ratio (dividend=0)

$$P = \frac{D + R/K(E - D)}{K}$$

$$= \frac{0 + 0.15/0.12(8 - 0)}{0.12}$$

= ₹ 83.33

At 25% payout ratio.

$$P = \frac{2 + 0.15/0.12(8\text{-}2)}{0.12}$$

= ₹ 79.16

At 50% payout ratio

$$P = \frac{4 + 0.15/0.12(8\text{-}4)}{0.12}$$

= ₹ 75.

At 75% payout ratio

$$P = \frac{6 + 0.15/0.12(8\text{-}6)}{0.12}$$

= ₹ 70.83

At 100% payout ratio

$$P = \frac{8 + 0.15/0.12(8\text{-}8)}{0.12}$$

= 66.67

Notes

Therefore, when R>K, price share will be maximum at 0% payout ratio. Price per share decreases as and when payout ratio is increased.

II when R<K (10%<12%)

At 0% payout ratio

$$P = \frac{0 + 0.10/0.12(8 - 0)}{0.12}$$

= ₹ 55.55

At 25% payout ratio

$$P = \frac{2 + 0.10/0.12(8 - 2)}{0.12}$$

= ₹ 58.33

At 50% payout ratio

$$P = \frac{4 + 0.10/0.12(8\text{-}4)}{0.12}$$

= ₹ 61.11

At 75% payout ratio

$$P = \frac{6 + 0.10/0.12(8\text{-}6)}{0.12}$$

= ₹ 63.88

At 100% payout ratio

$$P = \frac{8 + 0.10/0.12(8\text{-}8)}{0.12}$$

= ₹ 66.66

Therefore, when R<K, price per will be maximum at 100% payout ratio. Price per share increases as and when the payout ratio is increased.

III when R=K (12%=12%)

At 0% payout ratio

$$P = \frac{0 + 0.12/0.12(8\text{-}0)}{0.12}$$

= ₹ 66.66

At 25% payout ratio

$$P = \frac{2 + 0.12/0.12(8\text{-}2)}{0.12}$$

= ₹ 66.66

Notes

At 50% payout ratio

$$P = \frac{4 + 0.12/0.12(8\text{-}4)}{0.12}$$

= ₹ 66.66

At 75% payout ratio

$$P = \frac{6 + 0.12/0.12(8\text{-}6)}{0.12}$$

= ₹ 66.66

At 100% payout ratio

$$P = \frac{8 + 0.12/0.12(8\text{–}8)}{0.12}$$

= ₹ 66.66

Therefore, when R=K, price per share remains the same at all payout ratios. So, there is no one-payout ratio, which is optimum.

Task Given the following information about ABC Ltd. Show the effect of the dividend policy on the market price per share, using Walter's model.

EPS = ₹9, Cost of capital (K) = 14%

Assumed rate of return

1. 15%
2. 10%
3. 14%

13.1.2 Gordon's Model

Another theory, which contents that dividends are relevant, is the Gordon's model. This model which opines that dividend policy of a firm affects its value is based on the following

Assumptions

The key assumptions of Gordon's model are as follows:

1. The firm is an all equity firm (no debt).
2. There is no outside financing and all investments are financed exclusively by retained earnings.
3. Internal rate of return (R) of the firm remains constant.
4. Cost of capital (K) of the firm also remains same regardless of the changes in the risk complexion of the firm.
5. The firm derives its earnings in perpetuity.

Notes

6. The retention ratio (b) once decided upon is constant. Thus, the growth rate (g) is also constant ($g=b_r$).
7. The growth rate of the firm is product of its retention ration and its rate of return. i.e. $g= b_r$. It is constant.
8. A corporate tax does not exist.

Gordon used the following formula to find out price per share

$$P = \frac{E_1(1-b)}{K-b_r}$$

P = price per share

K = cost of capital

E_1 = earnings per share

b = retention ratio

(1-b) = payout ratio

g = b_r growth rate. (r = internal rate of return)

Implications with points according to Gordon

1. When R>K, the price per share increases as the dividend payout ratio decreases.
2. When R<K the price per share increases as the dividend payout ratio increases.
3. When R=K the prices per share remains unchanged in response to the change in the payout ratio.

Note Gordon's view on the optimum dividend payout ratio can be summarized as below:

1. The optimum payout ratio for a growth firm (R.K) is zero.
2. There is no optimum ratio for a normal firm (R = K).
3. Optimum payout ratio for a declining firm R<K is 100%.

Thus, the Gordon's Model's conclusions about dividend policy are similar to that of Walter. This similarity is due to the similarities of assumptions of both the models.

Illustration 2: If K= 11% and earnings per share is ₹15. Calculate the price per share of Sushma Ltd. For r = 12%, 11% and 10% for the following levels of D/P ratios.

	D/P ratios	Retention ratio
1.	10%	90%
2.	30%	70%
3.	50%	50%

Notes

Solution:

I **If R>K (12% > 11%)**

$$P = \frac{E_1(1-b)}{K-b_r}$$

1. D/P ratio of 10%. Retention ratio = 90%

$$P = \frac{15(1-0.9)}{0.11-0.9\times0.12}$$

= ₹ 750

2. D/P ratio of 30%. Retention ratio = 70%

$$P = \frac{15(1-0.7)}{0.11-0.7\times0.12}$$

= ₹ 173.08

3. D/P ratio of 50%. Retention ratio = 50%

$$P = \frac{15(1-0.5)}{0.11-0.5\times0.12}$$

= ₹ 125

II **If R=K (11% = 11%)**

(a) D/P ratio of 10%. Retention ratio = 90%

$$P = \frac{15(1-0.9)}{0.11-0.9\times0.11}$$

= ₹ 136.36

(b) D/P ratio of 30%. Retention ratio = 70%

$$P = \frac{15(1-0.7)}{0.11-0.7\times0.11}$$

= ₹ 136.36

(c) D/P ratio of 50%. Retention ratio = 50%

$$P = \frac{15(1-0.5)}{0.11-0.5\times0.11}$$

= ₹ 136.36

III **If R<K (10% < 11%)**

1. D/P ratio of 10%. Retention ratio is 90%

$$P = \frac{15(1-0.9)}{0.11-0.9\times0.10}$$

= ₹ 75

Notes

2. D/P ratio of 30%. Retention ratio is 70%

$$P = \frac{15(1-0.7)}{0.11-0.7\times0.10}$$

= ₹ 112.50

3. D/P ratio 50%. Retention ratio = 50%

$$P = \frac{15(1-0.5)}{0.11-0.5\times0.10}$$

= ₹ 125

From the above it is clear that, when R>K, the price per share increases and the payout ratio decreases, if R=K price per share remains same at all payout ratios. When R<K, the price per share increases with the increases in the payout ratio.

13.1.3 Modigliani-Miller Model (Irrelevance Theory)

According to MM, the dividend policy of a firm is irrelevant, as it does not affect the wealth of shareholders. The model which is based on certain assumptions, sidelined the importance of the dividend policy and its effect thereof on the share price of the firm. According to the theory, the value of a firm depends solely on its earnings power resulting from the investment policy and not influenced by the manner in which its earnings are split between dividends and retained earnings.

Explanation of MM's Arguments

M-M's irrelevance approach is based on arbitrage argument. Arbitrage is the process of entering into such transactions simultaneously as exactly balance or completely offset each other. The two transactions in the present case are payment of dividends and garnering funds to exploit investment opportunities. Suppose, for example, a firm decides to invest in a project it has alternatives:

1. Pay out dividends and raise an equal amount of funds from the market;
2. Retain its entire earnings to finance the investment programme. The arbitrage process is involved where a firm decides to pay dividends and raise funds from outside.

When a firm pays its earnings as dividends, it will have to approach market for procuring funds to meet a given investment programme. Acquisition of additional capital will dilute the firms share capital which will result in drop in share values. Thus, what the stockholders gain in cash dividends they lose in decreased share values. The market price before and after payment of dividend would be identical and hence the stockholders would be indifferent between dividend and retention of earnings. This suggests that dividend decision is irrelevant.

M-M's argument of irrelevance of dividend remains unchanged whether external funds are obtained by means of share capital or borrowings. This is for the fact that investors are indifferent between debt and equity with respect to leverage and cost of debt is the same as the real cost of equity.

Finally, even under conditions of uncertainty, divided decision will be of no relevance because of operation of arbitrage. Market value of share of the two firms would be the same if they identical with respect to business risk, prospective future earnings and investment policies. This is because of rational behavior of investor who would prefer more wealth to less wealth. Difference in respect of current and future dividend policies cannot influence share values of the two firms.

Notes

Assumption

1. ***Capital markets are perfect:*** Investors are rational as information is freely available, transaction cost are nil, securities are divisible and no investor can influence the market price of the share.
2. ***There are no taxes:*** No difference between tax rates on divisible and capital gains.
3. ***The firm has a fixed investment policy:*** Which will not change. So if the retained earnings are reinvested, there will not be any change in the risk of the firm. So K remains same.
4. ***Floatation costs does not exist:***

   The substance of MM arguments may be stated as below:

   (a) If the company retains the earnings instead of giving it out as dividends, the share holders enjoy capital appreciation, which is equal to the earnings, retained.

   (b) If the company distributes the earnings by the way of dividends instead of retention, the shareholders enjoy the dividend, which is equal to the amount by which his capital would have been appreciated had the company chosen to retain the earnings.

Hence, the division of earnings between dividends and retained earnings is irrelevant from the point of view of shareholders.

Criticisms

MM theory of division irrelevance is based on some assumptions. When these assumptions hold good, the conclusions derived by them are logically consistent and intuitively appealing. But the assumption will not hold water in the real world. So MM theory lacks practical relevance. The following are some of the limitations.

1. ***Tax differentials:*** MM's assumption that taxes does not exist is far from reality. Dividends are not taxed where as tax is levied on capital gains. So the shareholders may prefer dividend to capital gains.
2. ***Floatation cost:*** MM argue that payment of dividend and raising external funds are equivalent. This is not true in practice due to the presence of flotation costs. So a rupee of dividend cannot be replaced by a rupee by external funds. So it is advantageous to retain the earnings.
3. ***Transaction costs:*** In the absence of transition cost a rupee of capital value can be converted into a rupee of current income and vice versa. This implies that if the dividends are not paid, the shareholders desiring current income can sell a part of their holdings without incurring transaction cost. Because of the presence of the transaction cost, investors may prefer current dividend than retained earnings.
4. ***Diversification:*** If the company retains the earnings, investors cannot diversify their portfolios. As the investors are willing to pay a higher value to the company which pays more current dividend.
5. ***Uncertainty:*** MM argues that the prices of the 2 firms which are exactly identical in all the respect except with the dividend policy cannot be different. But this is not true due to "bird in hand argument".

Notes

Illustration 4: The following is the information relating to the acquiring company (A) and the Target Company (T)

	A	T
Earnings after Tax (EAT) (Rs).	50,00,000	10,00,000
Number of shares	5,00,000	2,00,000
Earnings per shares (Rs)	10	5
P/E Ratio	15	10
Market price per share (Rs)	150	50

Based on the evaluation of T, A has agreed to offer ₹ 65 per shares to T. This is 30% premium over the premerger market price of ₹ 50. If the offer price is ₹ 65, exchange ratio is determined as below.

$$ER = \frac{\text{Offer price}}{\text{Share price of the acquires}}$$

$$= \frac{65}{150} = 0.4333 \text{ shares}$$

So A will issue 0.4333 shares for every one share of the target company. The total number of shares to be issued is exchanged ratio x number of shares of T Company.

0.4333 × 2,00,000 = 86666 shares

Earnings per shares of the surviving company after the merges is calculated as below.

$$\frac{\text{Combined earnings}}{\text{Total Number of shares}}$$

$$= \frac{\text{Rs. } 60,00,000}{5,00,000 + 86666}$$

In the above case the EPS of A has increased from ₹ 10 to ₹ 10.22

Assuming that the offer price of ₹ 65 is rejected by the target company. So A company will offer ₹ 90 per shares to the target company. Now the exchange ratio would be:

$$ER = \frac{90}{150} = 0.60 \text{ shares}$$

So 0.6 shares of A must be issued for every shares of T company.

Total number of shares to be issued is 0.6 × 2,00,000 = 120,000 shares.

Now EPS of the surviving company after the merger would be:

$$EPS = \frac{60,00,000}{5,00,000 + 1,20,000} = \text{Rs.} 9.67$$

So when the offer prices is ₹ 90 per shares, the EPS of the A company falls to ₹ 9.67 from Rs. 10.

Notes

Task A textile company belongs to a risk-class for which the appropriate PE ratio is 10. It currently has 50,000 outstanding shares selling at ₹100 each. The firm is contemplating the declaration of ₹8 dividend at the end of the current fiscal year which has just started.

Given the assumption of MM, answer the following questions:

1. What will be the price of the share at the end of the year: (a) if a dividend is not declared, (b) if its is declared?
2. Assuming that the firm pays the dividend and has a net income of ₹5,00,000 and makes new investments of ₹10,00,000 during the period, how many new shares must be issued?
3. What would be the current value of the firm: (a) if a dividend is declared, (b) if a dividend is not declared?

13.2 Forms of Dividend

Dividend is the portion of earnings available to equity shareholders that equally (per share bias) is distributed among the shareholders. The following discussion deals with the different forms of dividends.

1. ***Cash Dividend:*** Generally many companies pay dividends in the form of cash. But payment of dividend in the form of cash requires enough cash in the bank or in hands. In other words, there should not be any shortage of cash for payment of dividends. Sufficient cash is available only when a company prepares cash budget to estimate the required amount for the period for which the budget is prepared. If the company finds any shortage of cash, it should make arrangements to borrow funds. But it may be difficult to prepare a cash budget with the expected amount needed for payment of dividends.
2. ***Scrip Dividend:*** In this form of dividends, the equity shareholders are issued transferable promissory notes for a shorter maturity period that may or may not be interest bearing. It is a simple payment of dividends in the form of promissory notes. Payment of dividend in this form takes place only when the firm is suffering from shortage of cash or weak liquidity position. Payment of dividends in the form of cash is justifiable only when the company has earned profits and it will take some time to convert current assets into cash.
3. ***Bond Dividend:*** Both scrip dividend and bond dividend are same, but they differ in terms of maturity. Bond dividends caries longer maturity whereas, scrip dividend carries shorter maturity. The effect of both forms of dividends on the company is the same. Bond dividend bears interest.
4. ***Property Dividend:*** The name itself suggests that payment of dividend takes place in the form of property. In other words, payment of dividends in the form of assets. This form of dividends takes place only when a firm has assets that are no longer necessary in the operation of business and shareholders are ready to accept dividend in the form of assets. This form of dividend payment is not popular in India.
5. ***Stock Dividend (Bonus Shares):*** Stock dividend is the payment of additional shares of common stocks to the ordinary shareholders. In other words, distribution of bonus shares to the stockholders instead of cash dividend.

Notes

Case Study

Future Earnings Per Share

Ramesh Products Case

This case allows the reader to apply the concept of future EPS in evaluating a course of action in terms of its effect on the market value of the firm's common stock.

Ramesh Products (RKP) is a medium-sized producer of chemicals and vinyl coating used in a variety of industrial processes. The company's main facilities are located in an industrial park in East Baltimost, a central site by a rail line that is linking the firm with its major customers on the east coast.

Last year the firm recorded over $200 million in sales, showed a net income of $53 million and concluded a very successful year. For the coming year, the firm expects a 15 per cent improvement in sales and operating income figures.

The firm's management committee, consisting of the president and the vice-presidents of production, marketing, and finance, will be meeting with in a week to discuss a major new activity for the next year. Products has been invited to bid on a long-term contract to produce a line of plastics for a large chemical company in Wilmington, Delaware. It appears that the firm can easily get the $50 million contract which should yield an additional $14 million in operating income. These figures are for next year only, and the firm estimates even higher sales and profits in the future.

Chowdhary vice -president of finance, has been studying the financial data related to the new line of plastics. The production manager knows of a small plastic company located about three miles from RKP's facilities. The plastics company has all the equipment needed to produce the new line of plastics; the company is for sale for $104 million. This price represents largely the value of the assets, since the company has lost its only large contracts. Chowdhary Prasad has discussed the purchase of this plastics company with a local real estate agent and has confirmed that it is available for $100 million.

Chowdhary Prasad figures that RKP has sufficient working capital to add the new plastics line but does not have the cash to buy the 100 million of machinery and equipment needed to begin the production. Discussion with a representative of a large Baltimore bank reveals that RKP can borrow $39 million through a 12 per cent mortgage on its main facilities. A mortgage company has indicated that it would help finance the plastic machinery with a $51 million, 13.6 per cent mortgage. Chowdhary Prasad is considering these choices but knows that RKP has traditionally kept its debt-asset ratio below 41 per cent He does not want to borrow if the additional debt causes the ratio to exceed 41 per cent.

Chowdhary Prasad discussed equity financing with RKP's investment banker on a recent trip to New Jersy City. He learned that the firm could probably issue upto $150 million in 15 per cent preferred stock or class A common stock. If the common stock were offered, it could net $20 per share to RKP. Chowdhary Prasad called new Jersy and confirmed that these options were still open to the firm.

In making decision on new investments, Chowdhary Prasad believes in the validity of the future-earnings per share technique. He knows that RKP has traditionally traded at a 6/1 price-earning multiple and he expects that this will hold. Thus, if a new project increases future earnings per share, it will increase the value of the firm for its shareholders.

Question

According to the future earning share approach and after detailed analysis what do you feel about the plastic project. Is it worth while to accept.

Notes

13.3 Summary

- Payment of dividend through issue of bonus share is a financial gimmick, since it will not affect the owners' wealth. The reasons for payment of dividend in the form of stock are to: bring the market price per share within a more popular range, promotes more active trading, reduce the nominal rate of dividend, increase paid up share capital, indicate the prospects of the firm, improve prospects of raising additional funds.
- Stock dividend is advantages for company and the owners. Advantages enjoyed by the issuing company are: Maintenance of liquidity portion, manage financial difficulties, attractive share price, enhances prestige, widening the share for market, availability of funds for expansion programme. Stock dividend is also beneficial to owners by tax savings, indication of future benefits, psychological value.
- Apart from the advantages stock dividend has the following disadvantages. Costly, reduces EPS and price earnings ratio, prevents new investor from becoming the shareholders of the firm, misuse of management power, since there is no dilution of control it is disadvantageous to the company. Disappointment of shareholders, shareholders wealth remains unaffected, lowers the market value of existing shares, less security to investors, done to reduction in reserves are the few disadvantages to owners.

13.4 Keywords

Inflation: It is the state of the economy in which the prices of the products have been increasing.

Scrip Dividend: It is the dividend payment method in the form of promissory note.

Stock Dividend: It is the payment of the additional shares of common stocks to the ordinary shareholders.

13.5 Self Assessment

Fill in the blanks:

1. Prof. James E Walter argues that the choice of ..... almost always affects the value of the firm.
2. The firms having R>K may be referred to as .....
3. According to MM, the dividend policy of a firm is .....
4. ..... carries longer maturity whereas, scrip dividend carries shorter maturity.
5. ..... is the payment of additional shares of common stocks to the ordinary shareholders.
6. Usual forms of paying dividend is .....
7. The issue of bonus shares amounts to a corresponding increase in the ..... of a firm.

State whether the following statement are true or false:

8. Stock dividend affects the liquidity position of the firm.
9. Management of earnings has nothing to do with retention of profits.
10. Ploughing back of profits is the same as self-financing.

Notes

13.6 Review Questions

1. 'Stock dividends are unfair to those stockholders who desire cash income', comment.
2. What is stock dividend? Discuss the advantages of stock dividend to the company.
3. The earnings per share of a company is ₹ 8 and the rate of capitalisation applicable is 10%. The company has before it an option of adopting (i) 5 0 % , (ii) 75%and (iii) 100% dividend payout ratio. Compute the market price of the company's quoted shares as per Walter's model if it can earn a return of (i) 15%, (ii) 10% and (iii) 5% on its retained earnings
4. Illustrate the Walter Model with a suitable example.
5. State the irrelevant theories of dividend.
6. ABC Ltd. has a capital of ₹10 lakhs in equity shares of ₹100 each. The shares currently quoted at par. The company proposes declaration of a dividend of ₹10 per share at the end of the current financial year. The capitalisation rate for the risk class to which the company belongs is 12%.

   What will be the market price of the share at the end of the year, if

   (a) A dividend is not declared?

   (b) A dividend is declared?

   (c) Assuming that the company pays the dividend and has net profits of ₹5,00,000 and makes new investments of ₹10 lakhs during the period, how many new shares must be issued?

   Use the M.M. model.
7. Illustrate that dividend policy is irrelevant.
8. Agile Ltd. belongs to a risk class of which the appropriate capitalisation rate is 10%. It currently has 1,00,000 shares selling at ₹ 100 each. The firm is contemplating declaration of a dividend of ₹6 per share at the end of the current fiscal year which has just begun. Answer the following questions based on Modigliani and Miller Model and assumption of no taxes:

   (a) What will be the price of the shares at the end of the year if a diviend is not declared?

   (b) What will be the price if dividend is declared?

   (c) Assuming that the firm pays dividend, has net income of ₹ 10 lakh and new investments of ₹ 20 lakhs during the period, how many new shares must be issued?

Answers: Self Assessment

1.	dividend payout ratio	2.	growth opportunities
3.	irrelevant	4.	Bond dividends
5.	Stock dividend	6.	Cash
7.	Paid up capital	8.	False
9.	False	10.	True

Notes

13.7 Further Readings

Books

Chandra, P. *Financial Management - Theory and Practice*, New Delhi, Tata McGraw-Hill Publishing Company Ltd., 2002, p. 3.

Sudhindra Bhat, *Financial Management,* New Delhi, Excel Books, 2008

Van Horne, J.C. and Wachowicz, Jr, J.M., *Fundamentals of Financial Management,* New Delhi, Prentice Hall of India Pvt. Ltd., 1996. p. 2.

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Unit 14: Break Even Analysis

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Objectives

After studying this unit, you will be able to:

- Define meaning and concept of break even analysis
- Discuss uses of break even analysis
- Explain advantages and limitations of break even analysis
- Describe methods of break even analysis

Introduction

Break even is the point where total revenue equals the total costs (variable and fixed). It is that level of activity at which an enterprise makes neither a loss nor any profit. At this point or level, the sales revenues are just equal to the costs incurred. Below this level the firm will make losses, while above this level it will be making profits.

14.1 Meaning and Concept of Break Even Analysis

Break even analysis examines the relationship between the total revenue, total costs and total profits of the firm at various levels of output. It is used to determine the sales volume required for the firm to break even and the total profits and losses at other sales level. Break even analysis is a method, as said by Dominick Salnatore, of revenue and total cost functions of the firm. According to Martz, Curry and Frank, a break even analysis indicates at what level cost and revenue are in equilibrium.

In case of break even analysis, the break even point is of particular importance.

Notes

Did u know? **What is Break Even Point?**

Break even point is that volume of sales where the firm breaks even i.e., the total costs equal total revenue.

It is, therefore, a point where losses cease to occur while profits have not yet begun. That is, it is the point of zero profit.

$$\text{BEP} = \frac{\text{Fixed Costs}}{\text{Selling price} - \text{Variable costs per unit}}$$

Example:

$$= \frac{\text{Fixed Costs Rs 10,000}}{\text{Selling price Rs 5 per unit} - \text{Variable costs Rs 3 per unit}}$$

Therefore, BEP = $\frac{\text{Rs } 10{,}000}{5 - 3}$=5,000 units.

The conclusion that can be drawn from the above example is that sales volume of 5000 units will be the accurate point at which the manufacturing unit would not make any loss or profit.

Note **Assumptions of Break Even Analysis**

The break even analysis is based on certain assumptions, namely:

1. All costs are either perfectly variable or absolutely fixed over the entire period of production but this assumption does not hold good in practice.
2. The volume of production and the volume of sales are equal; but in reality they differ.
3. All revenue is perfectly variable with the physical volume of production and this assumption is not valid.
4. The assumption of stable product mix is unrealistic.

14.2 Uses of Break Even Analysis

Break even analysis is a very generalised approach for dealing with a wide variety of questions associated with profit planning and forecasting. Some of the important practical applications of break even analysis are:

1. What happens to overall profitability when a new product is introduced?
2. What level of sales is needed to cover all costs and earn, say, ₹ 1,00,000 profit or a 14% rate of return?
3. What happens to revenues and costs if the price of one of a company's product is hanged?
4. What happens to overall profitability if a company purchases new capital equipment or incurs higher or lower fixed or variable costs?
5. Between two alternative investments, which one offers the greater margin of profit (safety)?

Notes

6. What are the revenue and cost implications of changing the process of production?
7. Should one make, buy or lease capital equipment?

Caution Margin of safety is the difference between the actual sales and sales at break even point. Sales beyond break even volume bring in profits. Such sales represent a margin of safety.

Margin of safety = Actual sales – Break even Sales

or = Profit/PV Ratio

or $$\frac{\text{Profit} \times \text{Selling Price per Unit}}{\text{Selling Price per Unit} - \text{Variable Cost Per Unit}}$$

Margin of safety as % of total sales

= Margin of Safety/Total cost × 100

14.3 Advantages of Break Even Point

A break even point does not help a person to run his business; its usefulness lies in the fact that it enables him to discern variations a little more clearly.

1. The usefulness of the break even point is evident in budgeting, forecasting and controlling costs. In itself, a break even point moves only with changing conditions and, in so moving, it flashes a warning.
2. The cost-volume-profit analysis deals with the net effect of changes in cost, price and volume in profits. It not only helps a management in profit prediction, but is also very useful to it in virtually all decision-making areas.
3. It is useful in product decisions, the pricing of products, the selection of channels of distribution, in making or buying decisions and if changing to the best methods of production.
4. The price-volume study method has proved to be of the greatest possible assistance to the management, for it enables to fix prices on a scientific basis.
5. A cost-volume-profit analysis is useful when, it determines the sales volume required to attain a given level of profits, and; it yields the most profitable combination of products to produce and sell.

14.4 Limitations of Break Even Analysis

Key limitations of break even analysis are:

1. It does not include adjustments for risk and uncertainty.
2. The break even chart shows the short-run relationship of total costs to total revenue. It is a static picture in which assumption of profit is influenced solely by the level of output.
3. A break even point is virtually useless, if the materials used fluctuate widely in price, particularly when these materials represent large proportions of the total cost.
4. If the product mix consists of product with varying profit margins, the picture presented by a simple break even point may be meaningless.

Notes

5. It is difficult in practice to distinguish between variable and fixed decision costs, particularly, when the distinction is drawn in the light of a specific problem situation and not in general terms.

6. A single fixed cost level clearly implies that the analysis is concerned with a situation within a single given plant capacity. If volume in excess of that limit is to be considered, then the same level of fixed costs would not be appropriate.

14.5 Methods of Break Even Analysis

The sales volume which equates total revenue with related costs and results in neither profit nor loss is called Break even Point (BEP). Break even point can be determined by the following methods:

14.5.1 Algebraic Method

Algebraic Methods

(i) Contribution Margin Approach

$$\text{Break even Point (units)} = \frac{\text{Fixed cost}}{\text{Contribution per Unit}}$$

$$\text{Break even point (₹)} = \frac{\text{Fixed cost}}{\text{P/V ratio}}$$

$$\text{OR} = \text{Break even units} \times \text{Selling price p.u.}$$

$$\text{P/V ratio} = \frac{\text{Contribution}}{\text{Sales}} \times 100$$

$$\text{Desired sales} = \frac{\text{Fixed cost + Desired profit}}{\text{P/V ratio}}$$

Desired sales or profit or fixed cost or to know variable cost we can use following equation i.e.,

Sales X P/V Ratio – Total Fixed Cost – Profit

At Break even point

$$\text{Contribution} = \text{Fixed cost}$$

$$\text{Contribution} - \text{Fixed cost} = 0$$

(ii) Equation Technique

It is based on an income equation i.e.

Sales – Total costs = Net profit.

Breaking up total costs into fixed and variable,

Sales – Fixed costs – Variable cost = Net profit

Sales = Fixed costs + Variable cost + Net profit

i.e. SP(S) = FC + VC(S) + P.

where

SP = Selling price per unit

Notes

S = Number of units required to be sold to break even

FC = Total fixed costs

VC = Variable cost per unit

P = Net profit (Zero)

SP(S) = FC + VC(S) + Zero

SP(S) = FC + VC(S) + 0

SP(S) – VC(S) = FC

Or S(SP – VC) = FC FC

S = FC (SP – VC)

To calculate the level of sales required to earn a particular level of profit, the formula is:

Required Sales = (Fixed cost + Desired profit)/P/V ratio.

Did u know? What is PV ratio?

The ratio or percentage of contribution margin to sales is known as P/V ratio. This ratio is also known as marginal income ratio, contribution to sales ratio, or variable profit ratio.

Example: KSBS Co. produces a simple article and sells it at ₹100 each at the mat. Cost of production is ₹ 60 p/unit and fixed cost ₹40,000 P/annum. Calculate:

1. P.V(ratio)
2. BEP (sales)

Solution

1. PV (r) = 100 – 60/100 × 100

   = 40/100 × 60 = 40%

2. BEP (sales) = 40,000/40 × 100

   = 4,00,000/4 = ₹ 1,00,000

Task Calculate BEP from the following informations:
Sales ₹ 500000, FC ₹ 150000, Profit ₹ 100000

14.5.2 Break Even Chart

According to the Chartered Institute of Management Accountants, London, the break even chart means, "A chart which shows profit or loss at various levels of activity, the level at which neither profit nor loss is shown being termed as the break even point". It is a graphic relationship between costs, volume and profits. It shows not only the BEP but also the effects of costs and revenue at varying levels of sales. The break even chart can, therefore, be more appropriately called the cost-volume-profit graph.

Notes

Assumptions regarding Break even Charts

1. Costs are bifurcated into variable and fixed components.
2. Fixed costs will remain constant and will not change with change in level of output.
3. Selling price will remain constant even though there may be competition or change in volume of production.
4. The number of units produced and sold will be the same so that there is no operating or closing stock.
5. There will be no change in operating efficiency.
6. In case of multi-product companies, it is assumed that the sales mix remains constant.
7. Variable cost per unit will remain constant during the relevant volume range of graph.

Note

Steps Involved in Construction of Break Even Chart

1. Select a scale for sales (units) on horizontal axis.
2. Select scale for costs and revenues on vertical axis.
3. Draw the fixed cost line parallel to the horizontal axis.
4. Draw the total cost line, starting from the point on the vertical axis which represents fixed costs.
5. Draw the sales line, starting from the point of origin (zero) and finishing at point of maximum sales.
6. The sales line will cut the total cost line at the point where the total cost equal to total revenues.
7. The point of intersection of two lines is called 'break even point' i.e., the point of no profit no loss.
8. The lines drawn from intersection to horizontal axis and vertical axis give the sales value and number of units produced at break even point.
9. The loss is shown if the production is less than the break even point and profit is shown if the production is more than the break even point.
10. The total sales minus break even sales represent the margin of safety.
11. The angle that the sales line makes with total cost line, while intersecting it at break even point is called 'angle of incidence'.

Illustration 1: From the following data, calculate the break even point by means of a break even chart:

Selling price per unit = ₹ 15

Variable cost per unit = ₹ 10

Total fixed cost = ₹ 1,50,000

Notes

Solution:

For plotting the data, we need at least two points – one for plotting the total cost line and the other for plotting the total sales line. Therefore, it will be necessary to presume different levels of output and sales as below:

Output Units	Fixed costs	Variable costs	Total costs	Sales
	(Rs.)	(Rs.)	(Rs.)	(Rs.)
0	1,50,000	–	1,50,000	–
10,000	1,50,000	1,00,000	2,50,000	1,50,000
20,000	1,50,000	2,00,000	3,50,000	3,00,000
30,000	1,50,000	3,00,000	4,50,000	4,50,000
40,000	1,50,000	4,00,000	5,50,000	6,00,000
50,000	1,50,000	5,00,000	6,50,000	7,50,000
60,000	1,50,000	6,00,000	7,50,000	9,00,000

Caselet

To Break Even, Tata hopes to sell 12,500 Nanos a month

Despite the slow start and low sales, Tata Motors hopes to sell more than 20,000 Nanos a month. And, if sales pick up, the company may increase the Sanand plant's capacity to 3.5 lakh units.

Tata Motors produces the Nano at Sanand in Gujarat.

The company should sell at least 12,500 units to make Nano a profitable venture.

Mr C. Ramakrishnan, Chief Financial Officer, Tata Motors, has indicated that it requires more than 60 per cent of plant capacity realisation for Nano to start making profit. The Sanand plant's installed capacity is 2.5 lakh units a year.

From July 2009 to October 2010, Tata Motors despatched 70,000 Nanos. The despatch to select customers is coming to an end and the company has started retail sales in 11 States.

"Typically in a small segment car, the margins are low, it's a volume and scale issue. Typically one would operate at around 60 per cent to 65 per cent break even. I do not want to comment specifically on Nano but that is typically the broad picture in passenger car industry, particularly in these segments," Mr Ramakrishnan said in a recent interaction with analysts.

"The plant has a capacity of 250,000 which can be increased to about 300,000 or even 350,000. So, on an average our hope and expectation would be we should be able to do about 20,000 to 25,000 cars a month," he said.

However, analysts do not share this optimism. Four auto analysts with stock broking firms whom Business Line spoke to expressed doubts over Nano clocking 20,000-plus numbers. Three of them did not want to be identified or their firms mentioned. Analysts said that issues related to availability and safety had impacted the sales prospect of Nano.

Immediate target

"I don't think they will make 20,000 anytime soon. Their immediate target would be around 10,000 units a month," said Mr Amol Bhutada, auto analyst with Elara Capital. "The sales might not exceed 8,000-10,000 levels in the near future," said another analyst.

Contd...

Notes

Tata Motors despatched 3,000 units of Nano in October. However, sales are expected to improve with the open sales in many states. Mr Bhutada said that the operating profit on Nano might have improved quite significantly with company hiking the price of the car by ₹ 9,000.

Volume game

"Nano is a volume game which is purely driven by pricing. The ex-showroom price of even the base version of Nano is now ₹ 1.4 lakh. There are pressures on raw material front," said another analyst.

Source: http://www.thehindubusinessline.in/2010/12/01/stories/2010120152730200.htm

14.6 Summary

- Break even analysis refers to ascertainment of level of operations where total revenue equal to total costs.
- This is the point where profit equal to zero or in other words BEP is point where there is no profit and loss.
- The break even chart indicates fixed and variable costs, sales revenue so that profit or loss at any given level of production or sales can be ascertained.
- Break even point helps in assessing the viability of the organization and to take decisions on profit planning and cost control.
- Break even point indicates the level of operating capacity and sales to be achieved to recover all costs.

14.7 Keywords

B E P (Units): It is the level of units at which the firm neither incurs a loss nor earns profit

BEP (Volume): It is the level of sales in Rupees at which the firm neither incurs a loss nor earns profit

Contribution: It is an amount of balance available after the deduction of variable cost from the sales

Fixed Cost: It is a cost which is fixed or remains the same for irrespective level of production

Variable Cost: It varies along with the level of production

14.8 Self Assessment

Fill in the blanks:

1. ..... is the point where total revenue equals the total costs.
2. ..... = $\frac{\text{Fixed Costs}}{\text{Selling price} - \text{Variable costs per unit}}$
3. The ..... deals with the net effect of changes in cost, price and volume in profits.
4. The ..... can be more appropriately called the cost-volume-profit graph.
5. The firm will make ..... below the BEP.
6. The firm will make ..... above the BEP.

Notes

7. According to Martz, Curry and Frank, a break even analysis indicates at what level cost and revenue are in .....
8. The break even chart shows the ..... relationship of total costs to total revenue.
9. Break even analysis does not include adjustments for risk and .....
10. The ratio or percentage of contribution margin to sales is known as .....

State whether the following statements are true or false:

11. Break Even is the point where TR > TC.
12. Costs incurred for pilots' salaries by a commercial airline can be classified as variable.
13. CVP analysis is useful in product decisions.
14. Break even analysis is a very generalised approach for dealing with a wide variety of questions associated with profit planning and forecasting.
15. If the product mix consists of product with varying profit margins, the picture presented by a simple break even point may be meaningless.

14.9 Review Questions

1. What do you understand by the term 'break even point'? Mention the types of problems which an accountant can expect to solve with the help of such analysis.

   You are required to calculate the break even point in the following case:

   The fixed costs for the year are ₹ 80,000, variable cost per unit for the single product is ₹ 4.

   Estimated sales for the period are valued at ₹ 2,00,000. The number of units involved coincides with the expected volume of output. Each unit sells at ₹ 20.

2. From the following results of a company, determine by how much the value of sales must be increased for the company to break even?

   Net sales – ₹ 400000

   Fixed Cost – ₹ 200000

   Variable Cost – ₹ 240000

   Use break even chart to illustrate this.

3. Golden Ltd. has annual fixed cost of ₹ 1,20,000. In the year 2005 sales amounted to ₹ 6,00,000 as compared with ₹ 4,50,000 in 2004 and the profit for 2005 was ₹ 50,000 higher than in 2004. You are required to:

   (i) Estimate profits for 2006 on forecast sales volume of ₹ 8,40,000 on the assumption that this would not involve any addition to the company's capacity; and

   (ii) Calculate the break even sales volume (in rupees).

4. The following information are available from the cost records of a manufacturing company:

   Fixed expenses ₹ 4.000

   Break even point ₹ 10,000

Notes

You are required to calculate:

(i) P/V ratio

(ii) Profit where sales are ₹ 20,000

5. Draw a break even chart that will show contribution more clearly than the orthodox presentation.
6. Taking suitable data construct a simple break even chart and show the break even point, angle of incidence and margin of safety on the chart.
7. Distinguish between P/V ratio and break even point?
8. What are the various applications of break even chart? What are the criticisms leveled against BEP analysis?
9. Fixed costs do not change with changes in volume and it is difficult for management to control them". Discuss.
10. "While variable costs are fixed per unit of output, the fixed costs are variable per unit of output although all costs tend to be variable in the long run". Explain.

Answers: Self Assessment

1.	Break Even	2.	BEP
3.	cost-volume-profit analysis	4.	Break Even chart
5.	losses	6.	profit
7.	equilibrium	8.	short-run
9.	uncertainty	10.	P/V ratio
11.	false	12.	false
13.	true	14.	true
15.	true		

14.10 Further Readings

Books

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Online links

http://www.fei.org/

www.scribd.com