

JMBA32

FINANCIAL MANAGEMENT



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SYLLABUS

JMBA32 - FINANCIAL MANAGEMENT

| UNIT | Details |
|------|--|
| I | Meaning, objectives and Importance of Finance – Sources of finance – Functions of financial management – Role of financial manager in Financial Management. |
| II | Capital structures planning - Factors affecting capital structures – Determining Debt and Equity proportion – Theories of capital structures – Leverage concept. |
| III | Cost of capital – Cost of equity – Cost of preference share capital – Cost of debt – Cost of retained earnings – Weighted Average (or) Composite cost of capital (WACC) |
| IV | Capital Budgeting: ARR, Payback period, Net present value, IRR, Capital rationing, simple problems on capital budgeting methods. |
| V | Working capital – Components of working capital – operating cycle – Factors influencing working capital – Determining (or) Forecasting of working capital requirements. |

| | Reading List |
|---|--|
| 1 | Dr. Kulkarni and Dr. SathyaPrasad, Financial Management, 13th Edition 2011 |
| 2 | Advanced Financial Management kohok, M A, Everest Publishing House |
| 3 | Financial Management Kishore R M, Taxman Allied Service |
| 4 | Strategic Financial Management Jakhotiya |
| 5 | Financial Management & Policy Srivastava, R M Himalaya |

CONTENTS

| UNITS | TITLE | PAGE NO. |
|--------------|---|-----------------|
| I | Meaning, objectives and Importance of Finance | 4 - 25 |
| II | Capital structures planning | 26 - 57 |
| III | Cost of capital | 58 - 81 |
| IV | Capital Budgeting | 82 - 113 |
| V | Working capital | 114 - 157 |

UNIT – I

INTRODUCTION

Structure:

1.1 Introduction

1.2 Meaning

1.3 Definitions

1.4 Nature or Characteristics of Financial Management

1.5 Objectives of Financial Management

1.6 Importance of Finance

1.7 Sources of Finance

1.8 Functions of Financial Management

1.9 Role of a Finance Manager

1.1 Introduction

Financial management during this century has undergone dramatic changes. The financial manager's responsibilities are broadening and becoming more vital for the development of the corporation. Once these responsibilities were mainly concerned with the procurement of funds, preparing reports, instruments and institutions for raising funds etc. At presents, the financial management emerges as immense important discipline both to the academicians and practitioners. They now have a major voice in all aspects of both raising and allocations of funds. It is of great interest to the academicians because subject is still growing and there are certain areas in financial management where controversies exist and no unanimous solutions have been reached yet. The practitioners are interested because they want solution of most crucial problems and financial management helps them in understanding, analyzing and solving the problem.

1.2 Meaning

Financial management involves obtaining funds required by an organization in the most economic and prudent manner and employment of these funds in the most optimum manner to maximize the returns to the owners. Since success of the organisation depends on raising of funds and their best utilization, financial management as a functional area has occupied a place of prime relevance. All business decisions have financial implications and hence financial management is related to each and every aspect of business operation.

In simple words, financial management includes any decision made by a business that affects its finances.

1.3 Definitions

It can be defined as “the management of flow of funds in a firm and it deals with the financial decision making of firm”.

According to Joshep and Massie. “Financial management is the operational activity of a business that is responsible for obtaining and effectively utilizing the funds necessary for efficient operations”.

According to Dr. S.N. Maheshwari, “Financial Management is concerned with raising financial resources and their effective utilization towards achieving the organisational goals”.

Howard and Upton: Financial management “as an application of general managerial Principles to the area of financial decision-making.

Weston and Brigham: Financial management “is an area of financial decision-making harmonizing individual motives and enterprise goals”.

Joshep and Massie: Financial management “is the operational activity of a business that is responsible for obtaining and effectively utilizing the funds necessary for efficient operations.

Thus, Financial Management is mainly concerned with the effective funds management in the business. In simple words, Financial Management as practiced by business firms can be called as Corporation Finance or Business Finance.

1.4 Nature or Characteristics of Financial Management

With the help of the following points we can understand the nature of financial management

1. Financial Management is a broader concept. It is not just about accounting of finance. It starts with procurement of funds as per the requirement and their best allocation. Financial planning is required till the business survive. It is an essential part of the business.
2. It is the integral part of management. Financial planning is the part of top level Management. Financial policies are drafted by top level managers and then it is executed by other levels.
3. Effective financial management helps in maximizing profits. Financial management helps in selecting the best alternate available. Funds are raised in a perfect combination of debt and equity which bears less cost of capital and are invested in best profitable avenues for higher returns.
4. It is scientific and analytical as it starts right from the beginning of business and continues till its survival. Financial management works on certain basic principles. It helps in selecting the best method of financing with less risk and higher returns. It helps in understanding the behavior and pattern of finance.
5. Financial Management is different from accounting. In accounting only collection of financial and related data is done whereas in financial management, analysis and decision making are main functions.

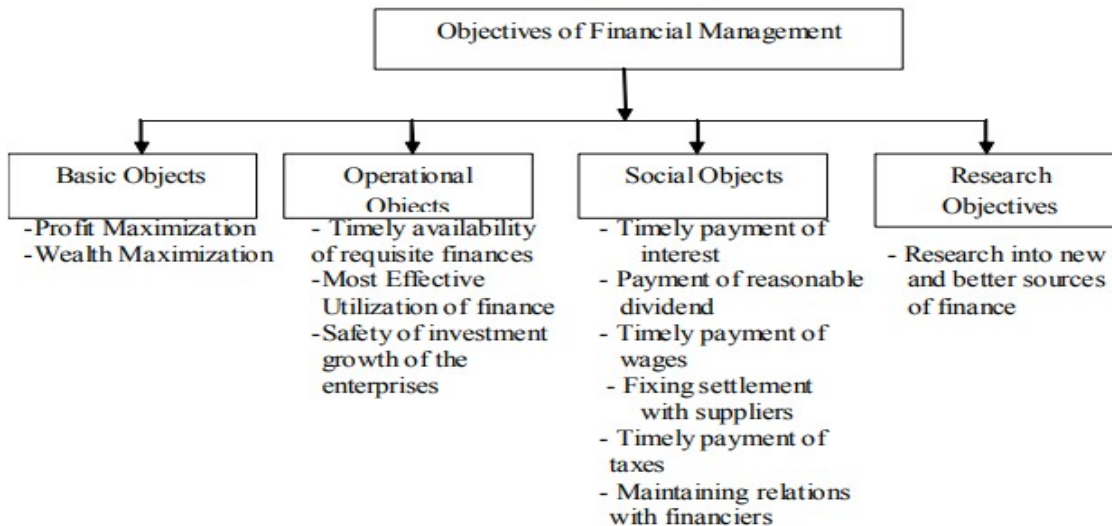
6. Financial Management is useful in every organisation whether it is sole proprietorship or corporate, manufacturing or service. It is applicable in non – profit organisation also.
Financial Management
Financial Decision
Investment Decision
Dividend Decision
Capital Structure Decision (Long Term Sources)
Working capital Financing (Short Term Sources)
Capital Expenditure Decisions
Current Assets or Working Capital Management
Cost Of Capital
7. Financial Management is helpful for top management in decision making.

1.5 Objectives of Financial Management

Objectives may be expressed as goals, purpose, targets, aims to be attained over a period of time. They also provide the standards to be judged or evaluate the performance of a business. The main purpose of financial management is to help the firm in achievement of its predetermined objectives. The objectives of financial management can be explained with the help of following figure:

Figure - 1.1

Objectives of Financial Management



Source: R.V. Badi and N.V. Badi, “Business Ethics”

1. Profit Maximization: Earning profit is the main objective of any business. It can be achieved by maximizing profits. Profit is the reward for risk. It also motivates for better performance. Survival of any business mainly depends upon its capacity of earning profits. Efficient and effective utilization of financial funds helps in achieving this goal. This objective was supported under the traditional approach of the financial management. Profit maximization as an objective of financial management can be justified on the following grounds:

- a) Earning more profit indicates the economic efficiency of a business whereas loss indicates economic inefficiency.
- b) Profit earning objective provides basis for strategic and tactical decisions. Profit is a premium for staying in business.

- c) Maximum social welfare activities like more wages, better quality of products at cheaper rate to customers, timely payment to creditors, more employment to society can be attained through earning more and more profits
- d) Profits can be said as major source of incentives in a business. If there is no profit incentives in a business, then there will be no competition and thus all the development process will be zero.
- e) The objective of profit maximization seems rational because it is a device which stimulates mankind into channels of useful services.

But like traditional approach it has been also criticized on some grounds which are as follows:

- ✓ It is narrow concept. It gives stress only on generating higher profits. It is not clear under this concept as which profit should be focused like gross profit, net profit, profit before tax or profit after tax.
- ✓ Earning profits give benefits only to its owners. It does not add much benefit to the society. Social responsibility is not fulfilled under this concept.
- ✓ Decisions taken for earning profits sometimes endangers the stability of the long run of business.
- ✓ The biggest disadvantage of this objective is that it ignores time value of money. Profits generated today do not have the same value as it is today. Rupee earned today has more value than its value after one or two years.
- ✓ This concept registers progress in monetary terms only. It completely ignores qualitative aspect. Contribution of humans is ignored under this.

- ✓ The objective of profit maximisation ignores the time value of money. Because profit received today is not same as it received after 1 or 2 years.
- ✓ It is vague term as it do not clear that profit increase in short term or long term.
- ✓ Earning more and more profit may be immoral and leads to corrupt practices.
- ✓ Profit maximisation objective sometimes degrades human ethical values.
- ✓ The objective of profit maximisation ignores social responsibility of a business.

2. Wealth Maximization: The profit maximisation objective is not only a vague term but it also ignores risk and time value of money. Therefore, the wealth maximisation objective is considered as basic objective rather than profit maximisation. According to Ezra Soloman, the ultimate objective of financial management should be maximisation of wealth. It is modern approach of Financial Management. It is also known as ‘Value maximizing’ or ‘Net worth Maximizing’. Financial Management helps in effective utilisation of its assets which is viewed in terms of benefits it can produce. Wealth maximisation objective means maximizing the wealth of the shareholders, by increasing the value of the firm. Increasing value of the firm means increasing the market price of a company’s share. The value of the firm is affected by many ways i.e. the firm’s growth, risk acceptable to the investors, efficiency and effectiveness of the firm, dividend policy etc.

A firm must consider following points to increase market value of shares.

- ✓ Customer should be managed properly.
- ✓ Maintain satisfactory dividend policy.
- ✓ Increase employees satisfaction level.
- ✓ Enhance information system.
- ✓ Improve quality of the products.

- ✓ Increase the market share by launching new products.

Wealth maximizing policy advocates following objectives:-

- ✓ It ensures long run survival and growth of the business.
- ✓ It increases the value of shares as high dividends are distributed under this.
- ✓ Dividend policy is designed in such a way to satisfy shareholders.
- ✓ A perfect combination of debt and equity mix is carried out.
- ✓ It reduces risk as projects having positive net present value are selected after careful and detailed investigation.
- ✓ Stakeholders are also satisfied as they feel connected with business.

1.6 Importance of Finance

Maximum utilization of financial resources to earn maximum profit is the main aim of financial management. The success of every business depends upon sufficient finance as per its requirement. The study of financial management is indispensable for both profit earning and non – profit earning organisations. Even the industrial progress of the country depends upon effective financial management.

In the words of Ezra Solomon, “Financial Management is properly viewed as an integral part of overall management rather than as a staff specially concerned with fund raising operations. In addition to raising funds, financial management is directly concerned with production, marketing and other functions within an enterprise whether decisions are made about the acquisitions or distribution of assets.” The same views have also been expressed by Irwin Friend who said, “a firm’s success and even survival, its ability and willingness to maintain production and to invest in the fixed or working capital are to a very considerable extent, determined by its financial policies, both past and present.”

Not only finance officers are related with financial management but every activity of business planning and control has become very significant. As Husband and Dockery have said, “something must direct the flow of economic activity that facilitates its smooth operations. Finance is the agent that produces this results.

Significance of financial management is being discussed under the following points:

- 1. Reduces Chances of Failure:** Implementation of proper system of financial management brings financial discipline in the organization. Every project is overlooked and carried out by detailed investigation which reduces chances of failure. Strong financial position ensures smooth functioning of the business.
- 2. Maximization of Returns:** Good financial planning maximizes returns on investment as financial management is of scientific and analytical nature. Under modern approach of financial management, main objective is of wealth maximization. These keep shareholders and other stakeholders satisfy.
- 3. Broader Concept:** Study of financial management has its applicability to each type of business from sole proprietorship to large business enterprises. It covers each and every financial activity in the business.
- 4. Makes Base for Planning and Control:** Financial planning forms base for planning of other departments. As it is noted that each departments depends upon financial department to starts their functioning. Various budget plans are drafted on the basis of financial availability.
- 5. Optimum and Effective Utilization of Resources:** Financial planning ensures optimum utilization of financial resources. Each and every stage is carefully planned under this beginning from generating funds to allocation and disposal of profits. Higher returns are

expected for smooth functioning and survival of the business which can be only achieved by properly managing funds.

- 6. Useful for Stakeholders:** Various stakeholders like business managers, investors, financial institutions, economist, politicians etc. are always interested in knowing financial position of the company as they maintain financial relation with business in some way.

1.7 Sources of Finance

1) Long Term Finance

Financing means providing money for investment in the form of fixed assets and also in the form of working capital needed for day to day operations.

I) External Sources:

1. Owned capital (Preference and Equity Capital)
2. Debentures
3. Public Deposits
4. Lease Financing
5. Hire Purchase
6. Institutional Assistance
7. Government subsidies 8. Mortgage Bonds
9. Venture Capital

II) Internal Sources:

1. Retained earnings
2. Provision for Depreciation

I) External Sources:

1. Preference Shares

Preference shares have two preferential rights. One at the time of payment of dividend and second repayment of capital at the time of liquidation of the company.

The company has the following advantages by this way of source:

- ✓ No voting rights and normally has no control over the policies.
- ✓ Finance through preference shares is less costly as compared to the equity shares.

The disadvantages of raising funds by way of preference capital are:

- ✓ Compared to equity capital it is a very expensive source of financing.
- ✓ Though there is no legal obligation to pay preference dividends, skipping them can adversely affect the image of the firm in the capital market.

2. Equity Shares

The equity shares are the main sources of finance and the owners of the company contribute it. It is the source of permanent capital since it does not have a maturity date. The holders of equity shares have a control over the working of the company. These shares are issued without creating any charge over the assets of the company. The major advantage to raise funds through equity shares is that it does not involve any fixed obligation for payment of dividends. The disadvantage of raising funds by way of equity capital is high cost of capital. The rate of return required by equity shareholders is generally higher than the rate of return required by other investors.

3. Debentures

Debentures are certificates issued by the company acknowledging the debt due by to its holders with or without a charge on the assets of the company. A fixed interest has to be paid regularly till the principal has been fully repaid by the company.

4. Institutional Assistance

The Government has set up certain special financial corporation with the object of stimulating industrial development in the country. These include IFC, SFC, ICICI, IDBI etc.

5. Public Deposits

Public deposits are the another important source for the firms. Companies prefer public deposits because, these deposits carry lower rate of interest

6. Lease Finance

Lease financing involves the acquisition of the economic use of an asset through a contractual commitment to make periodic payments called lease rentals to the person who owns the asset. Thus this is a mode of financing to acquire the use of assets.

7. Hire Purchase

Assets involving huge amounts if other sources of long-term finance are too costly may be acquired through hire purchase.

8. Government Assistance

The government provides finance to companies in cash grants and other forms of direct assistance, as part of its policy of helping to develop the national economy, especially in high technology industries and in areas of high unemployment. Government subsidies and concessions are other modes of financing long-term requirement. Subject to the government regulations, subsidies and concessions are granted to business enterprises.

9. Mortgage Bonds

It is a written promise given by the company to the investor to repay a specified sum of money at a specified rate of interest at a specified time

10. Venture capital

Venture capital is the Money provided by investors to startup firms and small businesses with perceived long-term growth potential. This is a very important source of funding for startups that do not have access to capital markets. It typically entails high risk for the investor, but it has the potential for above-average returns.

II) Internal Sources

1. Retained Earnings

A company out of its profits, a certain percentage is retained that amount is reinvested into the business for its development. This is also known ploughing back of profits.

2. Provision for Depreciation

Depreciation means decrease in the value of the asset due to wear and tear, lapse of time and accident. Provision for depreciation considered as one of the source of financing to business.

2) Short Term Sources

The sources of short-term funds used for financing variable part of working capital mainly include the following:

1. Loans from Commercial Banks

Small-scale enterprises can raise loans from the commercial banks with or without security. This method of financing does not require any legal formality except that of creating a mortgage on the assets. Loan can be paid in lump sum or in parts

2. Public Deposits

Often companies find it easy and convenient to raise short-term funds by inviting shareholders, employees and the general public to deposit their savings with the company. It is a simple method of raising funds from public for which the company has only to advertise and inform the public that it is authorised by the Companies Act 1956, to accept public deposits.

3. Trade Credit

Just as the companies sell goods on credit, they also buy raw materials, components and other goods on credit from their suppliers. Thus, outstanding amounts payable to the suppliers i.e., trade creditors for credit purchases are regarded as sources of finance. Generally, suppliers grant credit to their clients for a period of 3 to 6 months. Thus, they provide, in a way, short-term finance to the purchasing company.

4. Discounting Bills of Exchange

When goods are sold on credit, bills of exchange are generally drawn for acceptance by the buyers of goods. The bills are generally drawn for a period of 3 to 6 months. In practice, the writer of the bill, instead of holding the bill till the date of maturity, prefers to discount them with commercial banks on payment of a charge known as discount.

5. Factoring

Factoring is a financial service designed to help firms in managing their book debts and receivables in a better manner. The book debts and receivables are assigned to a bank called the “factor” and cash is realised in advance from the bank. For rendering these services, the fee or commission charged is usually a percentage of the value of the book debts/receivables factored. This is a method of raising short-term capital and known as “factoring”.

6. Bank Overdraft

Overdraft is a facility extended by the banks to their current account holders for a short period generally a week. A current account holder is allowed to withdraw from its current deposit account up to a certain limit over the balance with the bank. The interest is charged only on the amount actually overdrawn. The overdraft facility is also granted against securities.

7. Cash Credit

Cash credit is an arrangement whereby the commercial banks allow borrowing money up to a specified limit known as 'cash credit limit'. The cash credit facility is allowed against the security. The cash credit limit can be revised from time to time according to the value of securities. The money so drawn can be repaid as and when possible. The interest is charged on the actual amount drawn during the period rather than on the limit sanctioned. Arranging overdraft and cash credit with the commercial banks has become a common method adopted by companies for meeting their short-term financial, or say, working capital requirements.

8. Advances from Customers

One way of raising funds for short-term requirements is to demand for advance from one's own customers. Examples of advances from the customers are advance paid at the time of booking a car, a telephone connection, a flat, etc. This has become an increasingly popular source of short-term finance among the small business enterprises mainly due to two reasons. The enterprises do not pay any interest on advances from their customers. Thus, advances from customers become one of the cheapest sources of raising funds for meeting working capital requirements of companies.

9. Accrual Accounts

Generally, there is a certain amount of time gap between incomes is earned and is actually received or expenditure becomes due and is actually paid. Salaries, wages and taxes, for example, become due at the end of the month but are usually paid in the first week of the next month. Thus, the outstanding salaries and wages as expenses for a week helps the enterprise in meeting their working capital requirements. This source of raising funds does not involve any cost.

1.8 Functions of Financial Management

1. Estimation of Financial requirements

A finance manager has to make estimation with regards to capital requirements of the company. This will depend upon expected costs and profits and future programmes and policies of a concern. Estimations have to be made in an adequate manner which increases earning capacity of enterprise.

2. Determination of capital composition

Once the estimation have been made, the capital structure have to be decided. This involves short- term and long- term debt equity analysis. This will depend upon the proportion of equity capital a company is possessing and additional funds which have to be raised from outside parties.

3. Choice of sources of funds

For additional funds to be procured, a company has many choices like

- ✓ Issue of shares and debentures.
- ✓ Loans to be taken from banks and financial institutions.
- ✓ Public deposits to be drawn like in form of bonds.

4. Investment of funds

The finance manager has to decide to allocate funds into profitable ventures so that there is safety on investment and regular returns is possible. It can be –

- ✓ Capital Budgeting Decision – It is related to selection of long-term assets in which investments will be made by the company. Investment decisions are related to future and involve risk, that's why these should be evaluated in terms of expected risk and return.
- ✓ Working Capital decision – It is concerned with management of current assets. It is an important function of financial manager since short –term survival of the firm is a prerequisite for long term success.

5. Disposal of surplus

The net profits decision has to be made by the finance manager. This can be done in two ways:

- ✓ Dividend declaration - It includes identifying the rate of dividends and other benefits like bonus.
- ✓ Retained profits - The volume has to be decided which will depend upon expansion, innovational, diversification plans of the company.

6. Management of cash

Finance manager has to make decisions with regards to cash management. Cash is required for many purposes like payment of wages and salaries, payment of electricity and water bills, payment to creditors, meeting current liabilities, maintenance of enough stock, purchase of raw materials, etc.

7. Financial controls

The finance manager has not only to plan, procure and utilize the funds but he also has to exercise control over finances. This can be done through many techniques like ratio analysis, financial forecasting, cost and profit control, etc.

1.9 Role of a Finance Manager

In the present business context, the role of a finance manager is to perform the following functions:

1. Financial forecasting and planning

A finance manager has to estimate the financial needs of a business, for purchasing fixed assets and meeting working capital needs.

2. Acquisition of funds

There are number of sources available for supplying funds, like shares, debentures, financial institutions, commercial banks etc. The selection of an appropriate source is a difficult task to be exercised by the finance manager.

3. Investment of funds:

The funds so raised should be used in the best possible way. The cost of acquiring them and the returns from their investment should be compared. The technique of capital budgeting may be helpful in selecting a project.

4. Helping in valuation decisions:

A finance manager is supposed to assist the management in making valuation when mergers and consolidations take place.

5. Maintain proper liquidity:

Every concern is required to maintain some liquidity for meeting day-to-day needs. A finance manager is required to determine the need for liquid assets and then arrange liquid assets in such a way that there is no scarcity of funds.

Check Your Progress

Choose the Correct Answer:

1. What is Finance?

- a) Production of goods
- b) Management of money and funds
- c) Marketing of products
- d) Hiring employees

Answer: b) Management of money and funds

2. Which of the following is a main objective of financial management?

- a) Profit maximization
- b) Worker satisfaction
- c) Market research
- d) Product design

Answer: a) Profit maximization

3. Finance is important for which business activity?

- a) Purchasing assets
- b) Paying salaries
- c) Expanding business
- d) All of the above

Answer: d) All of the above

4. Which of the following is an internal source of finance?

- a) Bank loan
- b) Retained earnings
- c) Debentures
- d) Public deposits

Answer: b) Retained earnings

5. Which of the following is an external source of finance?

- a) Owner's capital
- b) Retained profits
- c) Bank loan
- d) Depreciation fund

Answer: c) Bank loan

6. The function of financial management includes:

- a) Investment decision
- b) Financing decision
- c) Dividend decision
- d) All of the above

Answer: d) All of the above

7. Financial management mainly deals with:

- a) Planning funds
- b) Controlling funds

- c) Managing funds
- d) All of the above

Answer: d) All of the above

8. Who is responsible for financial planning in a company?

- a) Production manager
- b) Financial manager
- c) Sales manager
- d) HR manager

Answer: b) Financial manager

9. One important role of a financial manager is:

- a) Managing cash flow
- b) Hiring workers
- c) Advertising products
- d) Designing products

Answer: a) Managing cash flow

10. Which source of finance is raised by issuing shares to the public?

- a) Equity share capital
- b) Bank loan
- c) Retained earnings
- d) Trade credit

Answer: a) Equity share capital

Small Questions – LOCF Mapping Table

| S.No | Small Question | CO | Bloom's Level | PO |
|------|---|-----|---------------|-----|
| 1 | Define Finance. | CO1 | Remembering | PO1 |
| 2 | State any two objectives of Financial Management. | CO1 | Understanding | PO1 |
| 3 | What are the sources of finance? | CO2 | Remembering | PO1 |
| 4 | List any two functions of Financial Management. | CO2 | Understanding | PO1 |
| 5 | Mention the role of a Financial Manager in an organization. | CO3 | Understanding | PO2 |

Big Questions – LOCF Mapping Table

| S.No | Big Question | CO | Bloom's Level | PO |
|------|--|-----|---------------|-----|
| 1 | Explain the meaning and importance of Finance. | CO1 | Understanding | PO1 |
| 2 | Discuss the objectives of Financial Management. | CO1 | Understanding | PO1 |
| 3 | Explain the various sources of finance. | CO2 | Understanding | PO2 |
| 4 | Describe the functions of Financial Management. | CO2 | Analyzing | PO2 |
| 5 | Explain the role of a Financial Manager in Financial Management. | CO3 | Analyzing | PO3 |

UNIT – II

CAPITAL STRUCTURES PLANNING

Structure:

2.1 Introduction

2.2 Meaning

2.3 Definitions

2.4 Importance of Capital Structure

2.5 Factors Affecting Capital Structure

2.6 Factors Determining Capital Structure

2.7 Theories of Capital Structures

2.8 Leverages

2.1 Introduction

The capital structure is how a firm finances its overall operations and growth by using different sources of funds. Debt comes in the form of bond issues or long-term notes payable, while equity is classified as common stock, preferred stock or retained earnings. Short-term debt such as working capital requirements is also considered to be part of the capital structure.

A company's proportion of short and long-term debt is considered when analyzing capital structure. When people refer to capital structure they are most likely referring to a firm's debt-to-equity ratio, which provides insight into how risky a company is. Usually a company more heavily financed by debt poses greater risk, as this firm is relatively highly levered.

2.2 Meaning

The term 'structure' means the arrangement of the various parts. So capital structure means the arrangement of capital from different sources so that the long-term funds needed for the business are raised.

Thus, capital structure refers to the proportions or combinations of equity share capital, preference share capital, debentures, long-term loans, retained earnings and other long-term sources of funds in the total amount of capital which a firm should raise to run its business.

The capital structure is the particular combination of debt and equity used by a company to finance its overall operations and growth. Debt comes in the form of bond issues or loans, while equity may come in the form of common stock, preferred stock, or retained earnings. Short-term debt such as working capital requirements is also considered to be part of the capital structure.

2.3 Definitions

According to Gerstenberg "Capital structure of a company refers to the make-up of its capitalisation and it includes all long-term capital resources viz., loans, reserves, shares and bonds".

According to John J. Hampton "Capital structure is the combination of debt and equity securities that comprise a firm's financing of its assets".

According to I. M. Pandey. "Capital structure refers to the mix of long-term sources of funds, such as, debentures, long-term debts, preference share capital and equity share capital including reserves and surplus".

2.4 Importance of Capital Structure

The importance or significance of Capital Structure:

1. Increase in value of the firm

A sound capital structure of a company helps to increase the market price of shares and securities which, in turn, lead to increase in the value of the firm.

2. Utilisation of available funds

A good capital structure enables a business enterprise to utilise the available funds fully. A properly designed capital structure ensures the determination of the financial requirements of the firm and raises the funds in such proportions from various sources for their best possible utilisation. A sound capital structure protects the business enterprise from over-capitalisation and under-capitalisation.

3. Maximisation of return

A sound capital structure enables management to increase the profits of a company in the form of higher return to the equity shareholders i.e., increase in earnings per share. This can be done by the mechanism of trading on equity i.e., it refers to increase in the proportion of debt capital in the capital structure which is the cheapest source of capital. If the rate of return on capital employed (i.e., shareholders' fund + long-term borrowings) exceeds the fixed rate of interest paid to debt-holders, the company is said to be trading on equity.

4. Minimisation of cost of capital

A sound capital structure of any business enterprise maximises shareholders' wealth through minimisation of the overall cost of capital. This can also be done by incorporating long-term debt capital in the capital structure as the cost of debt capital is lower than the cost of equity or preference share capital since the interest on debt is tax deductible.

5. Solvency or liquidity position

A sound capital structure never allows a business enterprise to go for too much raising of debt capital because, at the time of poor earning, the solvency is disturbed for compulsory payment of interest to the debt-supplier.

6. Flexibility

A sound capital structure provides a room for expansion or reduction of debt capital so that, according to changing conditions, adjustment of capital can be made.

7. Undisturbed controlling

A good capital structure does not allow the equity shareholders control on business to be diluted.

8. Minimisation of financial risk

If debt component increases in the capital structure of a company, the financial risk (i.e., payment of fixed interest charges and repayment of principal amount of debt in time) will also increase. A sound capital structure protects a business enterprise from such financial risk through a judicious mix of debt and equity in the capital structure.

2.5 Factors Affecting Capital Structure

1. Control

Determination of capital structure also operates in the company's willingness to maintain control. The issue of equity shares involves the risk of losing control. In this way, if the company is interested – in order to maintain control. He should prefer to use debt and preference share capital for equity share capital.

2. Size of Company

Small companies may have to rely on the founder's money but as they grow they will be eligible for long-term financing because larger companies are considered less risky by investors.

3. Nature of Business

If your business is a monopoly you can go for debentures because your sales can give you adequate profits to pay your debts easily or pay dividends.

4. The Regularity of Earnings

A firm with large and stable incomes may incur more debt in its capital structure, unlike the one that is unstable.

5. Capital Structure of Other Companies

Capital structure is influenced by the industry to which a company is related. All companies related to a given industry produce almost similar products, their costs of production are similar, they depend on identical technology, they have similar profitability, and hence the pattern of their capital structure is almost similar.

6. Conditions of the Money Markets

Capital markets are always changing. You don't want to issue company shares during a bear market, you do it when there is a bull run.

7. Government policy

This is important to consider. A change in lending policy may increase your cost of borrowing.

8. Cost of Floating

The cost of floating equity is much higher than that of floating debt. This may influence the finance manager to take debt financing the cheaper option.

9. Debt -Equity Ratio

As stated debt is a liability whose interest has to be paid irrespective of earnings. Equity, on the other hand, is shareholders money and payment depend on profits being paid. High debt in the capital structure is risky and may be a problem in adverse times. However, debt is cheaper than issuing shares. Debt interest has some tax deductions that is not the case for dividends paid to equity holders.

2.6 Factors Determining Capital Structure

The following factors influence the capital structure decisions:

1. Risk of cash insolvency

Risk of cash insolvency arises due to failure to pay fixed interest liabilities. Generally, the higher proportion of debt in capital structure compels the company to pay higher rate of interest on debt irrespective of the fact that the fund is available or not. The non-payment of interest charges and principal amount in time call for liquidation of the company.

The sudden withdrawal of debt funds from the company can cause cash insolvency. This risk factor has an important bearing in determining the capital structure of a company and it can be avoided if the project is financed by issues equity share capital.

2. Risk in variation of earnings

The higher the debt content in the capital structure of a company, the higher will be the risk of variation in the expected earnings available to equity shareholders. If return on investment on total capital employed (i.e., shareholders' fund plus long-term debt) exceeds the interest rate, the shareholders get a higher return. On the other hand, if interest rate exceeds return on investment, the shareholders may not get any return at all.

3. Cost of capital

Cost of capital means cost of raising the capital from different sources of funds. It is the price paid for using the capital. A business enterprise should generate enough revenue to meet its cost of capital and finance its future growth. The finance manager should consider the cost of each source of fund while designing the capital structure of a company.

4. Control

The consideration of retaining control of the business is an important factor in capital structure decisions. If the existing equity shareholders do not like to dilute the control, they may prefer debt capital to equity capital, as former has no voting rights.

5. Trading on equity

The use of fixed interest bearing securities along with owner's equity as sources of finance is known as trading on equity. It is an arrangement by which the company aims at increasing the return on equity shares by the use of fixed interest bearing securities (i.e., debenture, preference shares etc.).

If the existing capital structure of the company consists mainly of the equity shares, the return on equity shares can be increased by using borrowed capital. This is so because the interest paid on debentures is a deductible expenditure for income tax assessment and the after-tax cost of debenture becomes very low.

Any excess earnings over cost of debt will be added up to the equity shareholders. If the rate of return on total capital employed exceeds the rate of interest on debt capital or rate of dividend on preference share capital, the company is said to be trading on equity.

6. Government policies

Capital structure is influenced by Government policies, rules and regulations of SEBI and lending policies of financial institutions which change the financial pattern of the company totally. Monetary and fiscal policies of the Government will also affect the capital structure decisions.

7. Size of the company

Availability of funds is greatly influenced by the size of company. A small company finds it difficult to raise debt capital. The terms of debentures and long-term loans are less favourable to such enterprises. Small companies have to depend more on the equity shares and retained earnings. On the other hand, large companies issue various types of securities despite the fact that they pay less interest because investors consider large companies less risky.

8. Needs of the investors

While deciding capital structure the financial conditions and psychology of different types of investors will have to be kept in mind. For example, a poor or middle class investor may only be able to invest in equity or preference shares which are usually of small denominations, only a financially sound investor can afford to invest in debentures of higher denominations. A cautious investor who wants his capital to grow will prefer equity shares.

9. Flexibility

The capital structures of a company should be such that it can raise funds as and when required. Flexibility provides room for expansion, both in terms of lower impact on cost and with no significant rise in risk profile.

10. Period of finance

The period for which finance is needed also influences the capital structure. When funds are needed for long-term (say 10 years), it should be raised by issuing debentures or preference shares. Funds should be raised by the issue of equity shares when it is needed permanently.

11. Nature of business

It has great influence in the capital structure of the business, companies having stable and certain earnings prefer debentures or preference shares and companies having no assured income depends on internal resources.

12. Legal requirements

The finance manager should comply with the legal provisions while designing the capital structure of a company.

13. Purpose of financing

Capital structure of a company is also affected by the purpose of financing. If the funds are required for manufacturing purposes, the company may procure it from the issue of long-term sources. When the funds are required for non-manufacturing purposes i.e., welfare facilities to workers, like school, hospital etc. the company may procure it from internal sources.

14. Corporate taxation

When corporate income is subject to taxes, debt financing is favourable. This is so because the dividend payable on equity share capital and preference share capital are not deductible for tax purposes, whereas interest paid on debt is deductible from income and reduces a firm's tax liabilities. The tax saving on interest charges reduces the cost of debt funds.

Moreover, a company has to pay tax on the amount distributed as dividend to the equity shareholders. Due to this, total earnings available for both debt holders and stockholders is more

when debt capital is used in capital structure. Therefore, if the corporate tax rate is high enough, it is prudent to raise capital by issuing debentures or taking long-term loans from financial institutions.

15. Cash inflows

The selection of capital structure is also affected by the capacity of the business to generate cash inflows. It analyses solvency position and the ability of the company to meet its charges.

16. Provision for future

The provision for future requirement of capital is also to be considered while planning the capital structure of a company.

17. EBIT-EPS analysis

If the level of EBIT is low from HPS point of view, equity is preferable to debt. If the EBIT is high from EPS point of view, debt financing is preferable to equity. If ROI is less than the interest on debt, debt financing decreases ROE. When the ROI is more than the interest on debt, debt financing increases ROE.

2.7 Theories of Capital Structures

In finance literature, there are four prominent theories of capital structure. These are (i) Net Income Theory (Based on relevance approach), (ii) Net Operating Income Theory (Based on irrelevance approach), (iii) Traditional Theory (Based on relevance approach), and (iv) Modigliani & Miller Theory (Based on irrelevance approach). These theories discuss the effects of change in debt-equity mix (leverage) on cost of capital and the value of firm. The brief description of these theories is as follows:

1. Net Income Theory

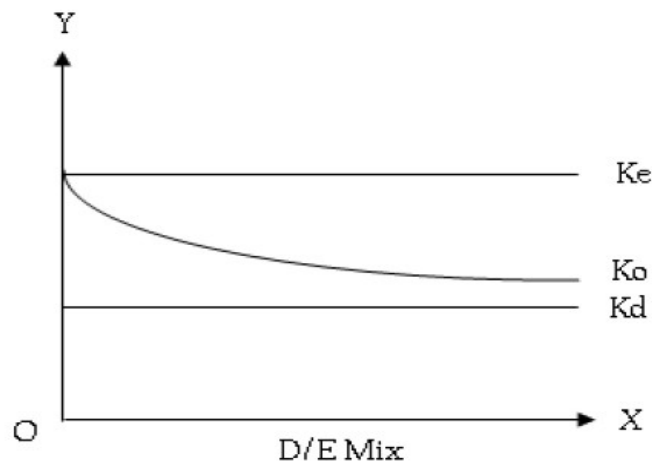
Net income (NI) theory was propounded by David Durand. It argues that capital structure decisions are relevant to the value of firm. This theory is based on certain assumptions; these are:

- ✓ There are two sources of capital - debt and equity.
- ✓ Firm can change debt-equity mix.
- ✓ Cost of debt (K_d) is less than cost of equity (K_e).
- ✓ Firm follows 100 percent dividend pay-out.
- ✓ Business risk is constant over time.
- ✓ There are no taxes.
- ✓ Use of debt does not change risk perception of common investors, so, K_e remains same at all degrees of financial leverage.

The theory states that an increase in proportion of debt, i.e. the degree of financial leverage will lead to decline in the firm's cost of capital, while the value of firm and market price of equity shares will increase and vice versa.

In simple words, using more debt capital with a corresponding reduction in cost of capital, the value of the firm will increase. It can be explained with the help of following figure –

Figure – 2



The main proposition of the theory is that ‘the value of firm (V) is determined by value of equity (E) and value of debt (D).’ Symbolically,

$$V = (E + D)$$

$$V = \frac{EBIT}{K_o}, D = \frac{I}{K_d} \text{ and } E = \frac{EE}{K_e}$$

Here: V = Value of firm, EBIT = Earnings before interest & tax, Ko = Overall cost of capital, D = Value of debt, I = Interest on debt, Kd = Cost of debt, E = Value of equity, EE = Equity earnings, and Ke = Cost of equity.

2. Net Operating Income Theory

Net income (NOI) theory also was given by David Durand; it is known as Durand’s second theory. It states that capital structure decisions are irrelevant to the cost of capital and the value of firm; hence, there is nothing like optimal capital structure. It is based on following assumptions.

- ✓ There are two sources of capital - debt and equity.

- ✓ Firm can change debt-equity mix.
- ✓ Cost of debt (K_d) is less than cost of equity (K_e).
- ✓ Cost of equity (K_e) increases with every increase in debt.
- ✓ Firm follows 100% dividend pay-out.
- ✓ Business risk is constant over time.
- ✓ Market evaluates firm as a whole, hence, split between debt and equity is irrelevant.
- ✓ There are no taxes.

The theory states that an increase in debt increases risk perception of common stockholders, hence, their expectations about return increase. This exactly offsets the advantage of low-cost debt to the firm, and results into no effect on cost of capital (K_o) and value of firm (V). The most significant assumption is that the K_o is constant irrespective of the degree of leverage. The segregation of debt and equity is not important here and the market capitalises the value of the firm as a whole. Thus, an increase in the use of apparently cheaper debt funds is offset exactly by the corresponding increase in the equity- capitalisation rate. So, the weighted average cost of capital K_o and K_d remain unchanged for all degrees of leverage. Needless to mention here that, as the firm increases its degree of leverage, it becomes more risky proposition and investors are to make some sacrifice by having a low price-earnings (PE) ratio. Main proposition of the theory is that the value of equity (E) is residual; it depends on value of firm (V) and the value of debt (D), $E = (V - D)$

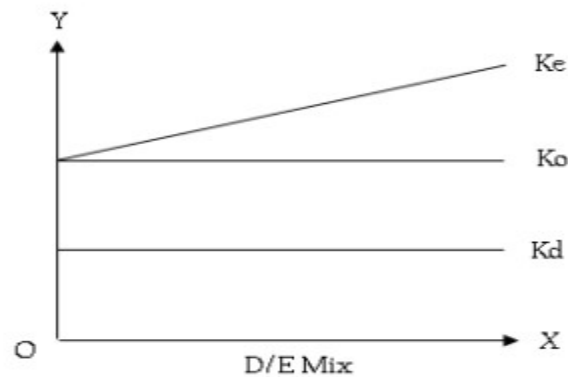
$$K_e = K_o + (K_o - K_d) \frac{D}{E}$$

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

Here: V = Value of firm, K_o = Overall cost of capital, D = Value of debt, K_d = Cost of debt, E = Value of equity, and K_e = Cost of equity

The crux of the theory can be explained with the help of following figure – 3.

Figure – 3



3. Traditional Theory

According to this theory, capital structure decisions are relevant to the cost of capital and the value of firm. Firm should strive to reach at the ‘optimal capital structure’. It is accepted by all that the judicious use of debt will increase the value of the firm and reduce the cost of capital. So, the optimum capital structure is the point at which the value of the firm is highest and the cost of capital is at its lowest point. Practically, this approach encompasses all the ground between the Net Income Approach and the Net Operating Income Approach, i.e., it may be called Intermediate Approach.

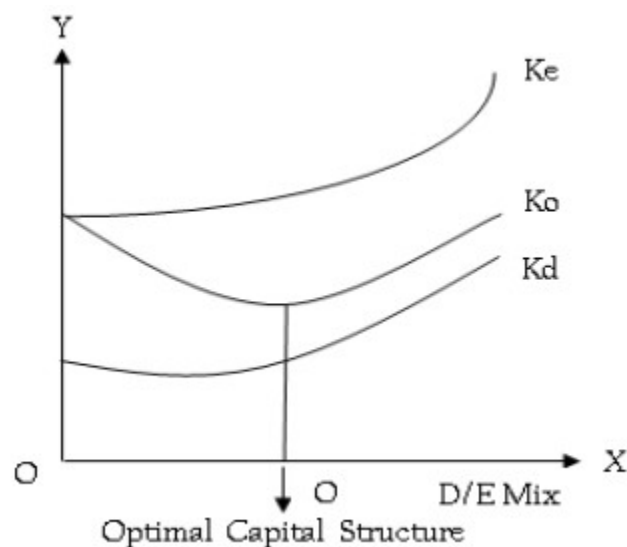
The traditional approach explains that up to a certain point, debt-equity mix will cause the market value of the firm to rise and the cost of capital to decline. But after attaining the optimum level, any additional debt will cause to decrease the market value and to increase the cost of capital. In other words, after attaining the optimum level, any additional debt taken will offset the use of cheaper debt capital since the average cost of capital will increase along with a

corresponding increase in the average cost of debt capital. Basic assumptions of theory are as follows:

- ✓ There are two sources of capital: debt and equity.
- ✓ Firm can change debt-equity mix.
- ✓ Cost of debt (K_d) is less than cost of equity (K_e).
- ✓ With increase in debt, initially, cost of equity (K_e) remains constant. But, after a point due to increase in risk perception of lenders and equity holders, both K_d and K_e increase.
- ✓ Firm follows 100% dividend payout ratio.
- ✓ Business risk is constant over time.
- ✓ There are no taxes

The theory states that because of increase in debt up to certain point, cost of capital (K_o) comes down and value of firm (V) increases; beyond that point, reverse trend emerges . The crux of the theory can be explained with the help of following figure – 4.

Figure – 4



The basic propositions of this approach are as follows:

- ✓ Stage I: With increase in debt, firm gets advantage of low-cost debt. Since K_e is constant, K_o decreases and V increases.
- ✓ Stage II: Further increase in debt leads to increased risk to equity holders. So, K_e increases, and as a result, K_o tends to increase, and V is decreasing.
- ✓ Stage III: Excessive increase in debt leads to increased K_e as well as K_d . This results into high K_o and low V .

In nutshell, traditional theory of Capital Structure says that a firm's value increases to a certain level of debt capital, after which it tends to remain constant and eventually begins to decrease if there is too much borrowing. This decrease in value after the debt tipping point happens because of overleveraging. On the other hand, a company with zero leverage will have a WACC equal to its cost of equity financing and can reduce its WACC by adding debt up to the point where the marginal cost of debt equals the marginal cost of equity financing. In essence, the firm faces a trade-off between the value of increased leverage against the increasing costs of debt as borrowing costs rise to offset the increase value. Beyond this point, any additional debt will cause the market value and to increase the cost of capital. A blend of equity and debt financing can lead to a firm's optimal capital structure.

4. Modigliani and Miller Theory

Modigliani – Miller (MM) theory is akin to NOI theory; it also talks about irrelevance of capital structure decisions. However, this theory provides operational and behavioral justification for irrelevance of capital structure.

Basic assumptions of MM theory are as follows:

- ✓ Perfect capital markets: Free market play, Free flow of information, Rational investors, Infinitely divisible securities, and No transaction costs.

- ✓ None of the investors can affect the stock price.
- ✓ Firms can be grouped into 'equivalent risk classes' based on their business risk. These are substitutable firms for investors.
- ✓ The cost of debt (k_d) is fixed and always lower than the cost of equity (K_e).
- ✓ Investor can borrow freely on the terms as the firm can.
- ✓ 100% dividend payout and No taxes (removed later)

Main propositions of this theory are as follows.

- ✓ Overall cost of capital (K_o) and value of firm (V) are independent of capital structure.
- ✓ Increase in debt leads to increased risk to equity holders and increased cost of equity (K_e), which exactly offsets advantage of low cost debt.
- ✓ Market value of firm (V) is equal to discounted operating income (EBIT), at a rate (K_o) appropriate to its risk class.

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

- ✓ The cost of capital is:

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

- ✓ A leveraged firm has higher cost of equity than an unlevered firm because it's cost of equity (K_e) include risk premia for financial risk.

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

The MM theory believes that valuation of a firm is irrelevant to its capital structure. The equation describing this relationship is: ($V_L = V_U$). Here, V_U is the market value of an

unlevered firm (capital is represented by equity only), and VL is the market value of a levered firm (capital is represented by a mix of debt and equity).

Thus, the market value of a firm depends on the operating income and business risk rather than its capital structure. Therefore, the market value of an unlevered firm can be calculated using the following formula.

$$V_U = V_L = \text{EBIT} / K_{eU}$$

Here, EBIT is earnings before interest and taxes, and K_{eU} is the required rate of return on equity of an unlevered firm.

The Modigliani-Miller theory of capital structure also believes that the weighted average cost of capital (WACC) is fixed at any level of financial leverage and equals the required rate of return on equity of an unlevered firm (K_{eU}). Thus, $\text{WACC} = K_{eU}$

Modigliani and Miller suggest that the weighted average cost of capital remains fixed because the risk is growing by an increase in financial leverage, and investors will claim a higher return to compensate for it. In other words, the required rate of return on equity will increase as financial leverage increases. Therefore, increasing cheaper debt will be offset by a higher required rate of return on equity. This relationship is described by the equation, $K_{eL} = K_{eU} + D/E (K_{eU} - K_{dU})$.

Here, k_{eL} is the required rate of return on equity of a levered firm, k_{eU} is the required rate of return on equity of an unlevered firm, d is the market value of debt, e is the market value of equity, and k_d is the required rate of return on debt.

The operational justification of this theory is explained through functioning of the process of arbitrage. The 'Process of Arbitrage' states that investors sell 'Over-valued' shares of levered firm and buy 'Under-valued' shares of unlevered firm. Therefore, the price of overvalued stock

will decline, and the price of undervalued stock will increase until they are equal, i.e., until the moment when market equilibrium will occur. When the market reaches equilibrium, arbitrage becomes impossible. Therefore, the market value of firms within the same class of business risk will be the same regardless of their capital structure.

The process of arbitrage sets right the discrepancy in the valuation of levered and unlevered firm. It's functioning can be explained as:

Firm A (Levered): $K_o \downarrow - V \uparrow - MPS \uparrow - \text{Sell} - MPS \downarrow - V \downarrow$

Firm B (Unlevered): $K_o \uparrow - V \downarrow - MPS \downarrow - \text{Buy} - MPS \uparrow - V \uparrow$

The theory also states that while switching his investment from levered to unlevered firm, an investor replaces 'corporate leverage' by 'personal/ home-made leverage'. The rationale behind this is that an investor, for equalizing risk in new investment (unlevered firm), will replicate the debt-equity mix of the firm in his personal capacity, and invest total fund (sale proceed plus loan) for maximizing return on investment.

Illustration 1: Expected earnings of a company are Rs. 2,00,000. It has 10 percent debt of Rs. 8,00,000. The equity capitalization rate (cost of equity) to the company is 12.5 percent. Using NI approach find out (i) Value of firm, and (ii) Overall cost of capital to the firm. If firm decides to redeem part of equity capital by raising further debt of Rs. 2,00,000, examine impact on overall cost of capital and the value of firm.

Solution:

| | Amount |
|--|-----------------|
| EBIT | 2,00,000 |
| Less: Interest @ 10% | 80,000 |
| Equity Earnings (EE) | 1,20,000 |
| Equity Capitalization Rate (Ke) | 12.5% |
| Value of Equity (E) | 9,60,000 |

| | |
|--|------------------|
| Value of Debt (D) | 8,00,000 |
| Value of Firm: V = (E + D) | 17,60,000 |
| Overall Cost of Capital (K_o) | 11,36% |

$$E = \frac{EE}{K_e} = \frac{1,20,000}{0.125} = \text{Rs. } 9,60,000$$

$$D = \frac{I}{K_d} = \frac{80,000}{0.10} = \text{Rs. } 8,00,000$$

$$\text{Since, } V = \frac{\text{EBIT}}{K_o}$$

$$K_o = \frac{\text{EBIT}}{V} = \frac{2,00,000}{17,60,000} = 11.36\%$$

If firm decides to redeem equity by raising further debt of Rs. 2,00,000 (i) The value of equity (S) will be 8,00,000; Value of debt (D) will be Rs. 10,00,000; and value of firm will increase to Rs. 18,00,000. (ii) The overall cost of capital will reduce to 11.11%. It proves application of NI approach.

Illustration 2: Expected earnings of a company are Rs. 4,00,000. It belongs to 10 percent risk class (it means overall cost of capital to the firm is 10 percent). Using NOI approach find out (i) Value of firm, and (ii) Cost of equity capital, if it employs 8 percent debt to the extent of 20 percent, 35 percent or 50 percent of total financial requirement of Rs. 20,00,000. Also prove how advantage of low-cost debt to firm gets neutralized as argued by NOI theory.

Solution:

| | 20% Debt | 35% Debt | 50% Debt |
|--|------------------|------------------|------------------|
| EBIT | 4,00,000 | 4,00,000 | 4,00,000 |
| Overall Cost of Capital | 10% | 10% | 10% |
| Value of Firm (V) | 40,00,000 | 40,00,000 | 40,00,000 |
| Amount of Debt (% of 20,00,000) | 4,00,000 | 7,00,000 | 10,00,000 |
| Interest @ 8% | 32,000 | 56,000 | 80,000 |
| Value of Debt (D) | 4,00,000 | 7,00,000 | 10,00,000 |
| Value of Equity: E = (V – D) | 36,00,000 | 33,00,000 | 30,00,000 |
| Equity Earning (EE) = (EBIT – Int.) | 3,68,000 | 3,44,000 | 3,20,000 |
| Cost of Equity (Ke) | 10.22% | 10.42% | 10.66% |

$$V = \frac{\text{EBIT}}{K_o} = \frac{4,00,000}{0,10} = 40,00,000$$

$$D = \frac{I}{K_d}$$

$$\text{Case of 20\% Debt: } D = \frac{32,000}{0,08} = 4,00,000$$

$$\text{Case of 35\% Debt: } D = \frac{56,000}{0,08} = 7,00,000$$

$$\text{Case of 50\% Debt: } D = \frac{80,000}{0,08} = 10,00,000$$

$$K_e = \frac{EE}{E}$$

$$\text{Case of 20\% Debt: } K_e = \frac{3,68,000}{36,00,000} = 10.22\%$$

$$\text{Case of 35\% Debt: } K_e = \frac{3,44,000}{33,00,000} = 10.42\%$$

$$\text{Case of 50\% Debt: } K_e = \frac{3,20,000}{30,00,000} = 10.66\%$$

$$\text{Proof of application of NOI Approach: } K_o = K_e \left(\frac{E}{E + D} \right) + K_d \left(\frac{D}{E + D} \right)$$

$$\text{Case of 20\% Debt: } K_o = 10.22 \left(\frac{36,00,000}{40,00,000} \right) + 8 \left(\frac{4,00,000}{40,00,000} \right) = 10$$

$$\text{Case of 35\% Debt: } K_o = 10.42 \left(\frac{33,00,000}{40,00,000} \right) + 8 \left(\frac{7,00,000}{40,00,000} \right) = 10$$

$$\text{Case of 50\% Debt: } K_o = 10.66 \left(\frac{30,00,000}{40,00,000} \right) + 8 \left(\frac{10,00,000}{40,00,000} \right) = 10$$

It proves that advantage of low-cost debt to firm gets neutralized due to increased cost of equity, and K_o remains same at all debt-equity mix.

Illustration 3: Expected earnings of a company are Rs. 3,00,000. It presently raised its total financial needs of Rs. 20,00,000 by issue of equity with equity capitalization rate of 16 percent. It is now contemplating to redeem a part of equity by raising debt to the extent of 30 percent or 50 percent of total capital. It is expected that the debt financing up to 30 percent, the rate of interest on debt will be 10 percent and equity capitalization rate will increase to 17 percent. However, if firm opts for 50 percent debt, the rate of interest on debt will be 12 percent and equity capitalization rate will further increase to 20 percent. Calculate (i) firm's overall cost of capital, and (ii) value of firm under different scenarios. Also find optimal capital structure.

Solution:

| | 0% Debt | 30% Debt | 50% Debt |
|----------------------|-----------------|-----------------|-----------------|
| Total Debt | | 6,00,000 | 10,00,000 |
| Interest Rate | | 10% | 12% |
| EBIT | 3,00,000 | 3,00,000 | 3,00,000 |
| Less: Interest | | 60,000 | 1,20,000 |
| Equity Earnings (EE) | 3,00,000 | 2,40,000 | 1,80,000 |

| Equity Capitalization Rate (K_e) | 16% | 17% | 20% |
|--|------------|---------------|---------------|
| Value of Equity (E) | 18,75,000 | 14,11,176 | 9,00,000 |
| Value of Debt (D) | | 6,00,000 | 10,00,000 |
| Value of Firm: $V = (E + D)$ | 18,75,000 | 20,11,176 | 19,00,000 |
| Overall Cost of Capital (K_o) | 16% | 14.91% | 15.78% |
| | | Optimal Point | |

$$E = \frac{EE}{K_e}$$

$$\text{Case of 0\% Debt: } E = \frac{3,00,000}{0.16} = 18,75,000$$

$$\text{Case of 30\% Debt: } E = \frac{2,40,000}{0.17} = 14,11,176$$

$$\text{Case of 50\% Debt: } E = \frac{1,80,000}{0.20} = 9,00,000$$

$$D = \frac{I}{K_d}$$

$$\text{Case of 30\% Debt: } D = \frac{60,000}{0.10} = 6,00,000$$

$$\text{Case of 50\% Debt: } E = \frac{1,20,000}{0.12} = 10,00,000$$

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

$$\text{Case of 0\% Debt: } K_o = \frac{3,00,000}{18,75,000} = 16\%$$

$$\text{Case of 30\% Debt: } K_o = \frac{3,00,000}{20,11,176} = 14.91\%$$

$$\text{Case of 50\% Debt: } K_o = \frac{3,00,000}{19,00,000} = 15.78\%$$

It proves that at optimal debt-equity mix, K_o is minimum, and V is maximum.

2.8 Leverages

Leverage, as a business term, refers to debt or to the borrowing of funds to finance the purchase of a company's assets. Business owners can use either debt or equity to finance or buy the company's assets. Using debt, or leverage, increases the company's risk of bankruptcy. It also increases the company's returns; specifically its return on equity. This is true because, if debt financing is used rather than equity financing, then the owner's equity is not diluted by issuing more shares of stock.

Meaning

Leverage is a practice which can help a business drive up its gains / losses. In business language, if a firm has fixed expenses in P/L account or debt in capital structure, the firm is said to be levered. Nowadays, almost no business is away from it but very few have struck a balance.

Types of Leverage

There is a different basis for classifying business expenses. For our convenience, let us classify fixed expenses into operating fixed expenses such as depreciation on fixed expenses, salaries etc, and financial fixed expenses such as interest and dividend on preference shares. Similar to them, leverages are also of two types – financial and operating.

Financial Leverage (FL)

It is a leverage created with the help of debt component in the capital structure of a company. Higher the debt, higher would be the FL because with higher debt comes the higher amount of interest that needs to be paid. It can be both good and bad for a business depending on the situation. If a firm is able to generate a higher return on investment (ROI) than the interest rate it is paying, leverage will have its positive effect shareholder's return. The darker side is that if the said situation is opposite, higher leverage can take a business to a worst situation like bankruptcy.

Operating Leverage (OL)

Just like the financial, it is a result of operating fixed expenses. Higher the fixed expense, higher is the OL. Like the FL had an impact on the shareholder's return or say earnings per share, OL directly impacts the operating profits (Profits before Interest and Taxes (PBIT)). Under good economic Conditions, an increase of 1% in sales will have more than 1% change in operating profits.

Combined Leverage (CL)

It means combination of operating and financial leverages. It expresses the effect of changes on sales over changes in taxable profit.

Illustration 4: Calculate the operating financial and combined leverage from the following information:

Sales – 35,000 Interest – 2,500 Variable costs – 20,000 Fixed cost – 10,000

Solution:

| Particulars | Rs. |
|---------------------------------|--------------|
| Sales | 35000 |
| <u>Less:</u> Variable cost | 20000 |
| Contribution | 15000 |
| <u>Less:</u> Fixed cost | 10000 |
| Operating profit (EBIT) | 5000 |
| <u>Less:</u> Interest | 2500 |
| Profit before tax (EBIT) | 2500 |

a) Operating Leverage Contribution / Operating profit (Or) Contribution / EBIT

$$= 15000/5000 = 3 \text{ times}$$

b) Financial Leverage Operating profit / Profit before tax (Or) EBIT / EBT

$$= 5000/2500 = 2 \text{ times}$$

c) Combined Leverage Operating leverage X Financial Leverage

$$= 3 \times 2 = 6$$

Illustration 5: A firm has sales of Rs. 10,00,000, variable cost of Rs. 7,00,000 and fixed costs of Rs. 2,00,000 and debt of Rs. 5,00,000 at 10% rate of interest. What are the operating, financial

and combined leverages. If the firm wants to double its earnings before interest and tax (EBIT), how much of a rise in sales would be needed on a percentage basis?

Solution:

| Particulars | Rs. |
|--|-----------------|
| Sales | Rs.10,00,000 |
| Less Variable cost | 7,00,000 |
| Contribution | 3,00,000 |
| Less Fixed cost | 2,00,000 |
| EBIT | 1,00,000 |
| Less Interest @ 10% on 5,00,000 | 50,000 |
| Profit after Tax | 50,000 |

Operating leverage $\text{Contribution/ EBIT} = 3,00,000/1,00,000 = 3$

Financial Leverage $\text{EBIT/PBT} = 1,00,000/50,000 = 2$

Combined Leverage = $3 \times 2 = 6$

Statement of sales needed to double EBIT

Operating Leverage is 3 times i.e. 33 – 1/3% increase in sales volume causes a 100% increase in operating profit or EBIT. Thus, at the sales of Rs. 13,33,333, operating profit or EBIT will become Rs. 2,00,000 i.e. double existing one.

Verification:

| Particulars | Rs. |
|---------------------------------|-----------------|
| Sales | Rs.13,33,333 |
| Less Variable cost (70%) | 9,33,333 |
| Contribution | 4,00,000 |
| Less Fixed cost | 2,00,000 |
| EBIT | 2,00,000 |

Illustration 6: The balance sheet of Well Established Company is as follows:

| Liabilities | Rs. | Assets | Rs. |
|----------------------|-----------------|----------------|-----------------|
| Equity share capital | 60,000 | Fixed Assets | 1,50,000 |
| Retained Earnings | 20,000 | Current Assets | 50,000 |
| 10% long term debt | 80,000 | | |
| Current Liabilities | 40,000 | | |
| | 2,00,000 | | 2,00,000 |

The company's total assets turnover ratio is 3, its fixed operating costs are Rs.1,00,000 and its variable operating cost ratio is 40%. The income tax rate is 50%. Calculate the different types of leverages given that the face value of share is Rs.10.

Solution:

Total Assets Turnover Ratio = Sales / Total Assets

$$3 = \text{Sales} / 2,00,000$$

| Particulars | Rs. |
|---|-----------------|
| Sales | 6,00,000 |
| Less Variable Operating Cost (40%) | 2,40,000 |
| Contribution | 3,60,000 |
| Less Fixed Operating Cost | 1,00,000 |
| EBIT | 2,60,000 |
| Less interest (10% of 80,000) | 8,000 |
| PBT | 2,52,000 |
| Less Tax at 50% | 1,26,000 |
| PAT | 1,26,000 |
| Number of shares | 6,000 |
| EPS | Rs.21 |

Degree of Operating Leverage = Contribution/EBIT

$$= 3,60,000/2,60,000 = 1.38$$

Degree of Financial leverage = EBIT / PBT

$$= 2,60,000/2,52,000 = 1.03$$

Degree of Combined Leverage

$$= 1.38 \times 1.03 = 1.42$$

Illustration 7: The following information is available for ABC & Co.

EBIT Rs. 11,20,000, Profit before Tax 3,20,000, Fixed Costs 7,00,000 Calculate % change in EPS if the sales are expected to increase by 5%

Solution: In order to find out the % change in EPS as a result of % change in sales, the combined leverage should be calculated as follows:

Operating Leverage = Contribution/ EBIT

$$= \text{Rs. } 11,20,000 + \text{Rs. } 7,00,000 / 11,20,000 = 1.625$$

Financial Leverage = EBIT / Profit before Tax

$$= \text{Rs. } 11,20,000 / 3,20,000 = 3.5$$

Combined Leverage = Contribution/ Profit before Tax

$$= \text{OL} \times \text{FL} = 1.625 \times 3.5 = 5.69$$

The combined leverage of 5.69 implies that for 1% change in sales level, the % change in EPS would be 5.69% So, if the sales are expected to increase by 5%, then the % increase in EPS would be $5 \times 5.69 = 28.45\%$.

Check Your Progress

Choose the Correct Answer:

1. Capital structure refers to the:

- a) Total assets of a firm
- b) Mix of debt and equity used by a firm
- c) Total sales of a firm
- d) Profit earned by a firm

Answer: b) Mix of debt and equity used by a firm

2. Capital structure planning mainly aims to:

- a) Maximize cost
- b) Minimize cost of capital
- c) Increase expenses
- d) Reduce production

Answer: b) Minimize cost of capital

3. Which of the following is a factor affecting capital structure?

- a) Cost of capital
- b) Risk factor
- c) Control considerations
- d) All of the above

Answer: d) All of the above

4. Debt capital means:

- a) Owner's investment
- b) Borrowed funds
- c) Retained earnings
- d) Share capital

Answer: b) Borrowed funds

5. Equity capital refers to:

- a) Borrowed money
- b) Loans from banks
- c) Owner's funds
- d) Public deposits

Answer: c) Owner's funds

6. Which theory states that capital structure is irrelevant to the value of the firm?

- a) Net Income Theory
- b) Net Operating Income Theory
- c) Traditional Theory
- d) Pecking Order Theory

Answer: b) Net Operating Income Theory

7. Leverage refers to the use of:

- a) Fixed cost assets or funds
- b) Variable costs

- c) Sales promotion
- d) Marketing strategies

Answer: a) Fixed cost assets or funds

8. Financial leverage arises due to:

- a) Fixed operating costs
- b) Use of debt capital
- c) Increase in sales
- d) Reduction in expenses

Answer: b) Use of debt capital

9. Operating leverage is related to:

- a) Fixed operating costs
- b) Debt capital
- c) Equity capital
- d) Dividend policy

Answer: a) Fixed operating costs

10. The combination of operating leverage and financial leverage is called:

- a) Total leverage
- b) Debt leverage
- c) Equity leverage
- d) Capital leverage

Answer: a) Total leverage

Small Questions – LOCF Mapping Table

| S.No | Small Question | CO | Bloom's Level | PO |
|------|--|-----|---------------|-----|
| 1 | Define Capital Structure. | CO1 | Remembering | PO1 |
| 2 | State any two factors affecting Capital Structure. | CO1 | Understanding | PO1 |
| 3 | What is meant by Financial Leverage? | CO2 | Understanding | PO2 |
| 4 | A firm has Equity ₹2,00,000 and Debt ₹1,00,000. Calculate the Debt–Equity Ratio. | CO3 | Applying | PO2 |
| 5 | If EBIT is ₹50,000 and Interest is ₹10,000, calculate Financial Leverage. | CO3 | Applying | PO3 |

Big Questions – LOCF Mapping Table

| S.No | Big Question | CO | Bloom's Level | PO |
|------|--|-----|---------------|-----|
| 1 | Explain the concept and importance of Capital Structure Planning. | CO1 | Understanding | PO1 |
| 2 | Discuss the factors affecting the Capital Structure of a firm. | CO1 | Analyzing | PO2 |
| 3 | Explain the various theories of Capital Structure. | CO2 | Understanding | PO2 |
| 4 | A company has Debt ₹3,00,000 and Equity ₹2,00,000. Calculate the Debt–Equity Ratio and interpret the result. | CO3 | Applying | PO3 |
| 5 | A firm has EBIT ₹1,00,000 and Interest ₹20,000. Calculate Financial Leverage. | CO3 | Applying | PO3 |

UNIT – III

COST OF CAPITAL

Structure:

3.1 Introduction

2.2 Meaning

2.3 Definitions

2.4 Significance of Cost of Capital

2.5 Classification of Cost of Capital

2.6 Determination of Cost of Capital

2.7 Cost of Equity capital (K_e):

2.8 Cost of Preference Share Capital

2.9 Cost of Debt (K_d)

2.10 Cost of Retained Earnings (K_r)

2.11 Weighted Average Cost of Capital (K_o):

3.1 Introduction

The cost of capital is used by companies in order to evaluate new projects. In terms of accounting, it may be defined as the cost of a company's funds which includes both debt and equity. Basically, it serves as a benchmark which a company sets for its new projects. The cost of capital should be considered while taking investment decisions for a company. This unit will help you to understand the meaning and importance of cost of capital.

2.2 Meaning

Cost of capital is the return expected by the providers of capital (i.e. shareholders, lenders and the debt-holders) to the business as a compensation for their contribution to the total capital. When an entity (corporate or others) procured finances from either sources as listed above, it has to pay some additional amount of money besides the principal amount. The additional money paid to these financiers may be either one off payment or regular payment at specified intervals. This additional money paid is said to be the cost of using the capital and it is called the cost of capital. This cost of capital expressed in rate is used to discount/ compound the cashflow or stream of cashflows. Cost of capital is also known as 'cut-off' rate, 'hurdle rate', 'minimum rate of return' etc. It is used as a benchmark for:

- ✓ Framing debt policy of a firm.
- ✓ Taking Capital budgeting decisions.

2.3 Definitions

Ezra Solomon defines "Cost of capital is the minimum required rate of earnings or cutoff rate of capital expenditure".

According to Mittal and Agarwal "the cost of capital is the minimum rate of return which a company is expected to earn from a proposed project so as to make no reduction in the earning per share to equity shareholders and its market price".

According to Khan and Jain, cost of capital means "the minimum rate of return that a firm must earn on its investment for the market value of the firm to remain unchanged".

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

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

2.4 Significance of Cost of Capital:

1. Maximization of the Value of the Firm

For the purpose of maximization of value of the firm, a firm tries to minimize the average cost of capital. There should be judicious mix of debt and equity in the capital structure of a firm so that the business does not to bear undue financial risk.

2. Capital Budgeting Decisions

Proper estimate of cost of capital is important for a firm in taking capital budgeting decisions. Generally cost of capital is the discount rate used in evaluating the desirability of the investment project. In the internal rate of return method, the project will be accepted if it has a rate of return greater than the cost of capital. In calculating the net present value of the expected future cash flows from the project, the cost of capital is used as the rate of discounting. Therefore, cost of capital acts as a standard for allocating the firm's investible funds in the most optimum manner. For this reason, cost of capital is also referred to as cutoff rate, target rate, hurdle rate, minimum required rate of return etc.,

3. Decisions Regarding Leasing

Estimation of cost of capital is necessary in taking leasing decisions of business concern.

4. Management of Working Capital

In management of working capital the cost of capital may be used to calculate the cost of carrying investment in receivables and to evaluate alternative policies regarding receivables. It is also used in inventory management also.

5. Dividend Decisions

Cost of capital is significant factor in taking dividend decisions. The dividend policy of a firm should be formulated according to the nature of the firm— whether it is a growth firm, normal firm or declining firm. However, the nature of the firm is determined by comparing the internal rate of return (r) and the cost of capital (k) i.e., $r > k$, $r = k$, or $r < k$ which indicate growth firm, normal firm and decline firm, respectively.

6. Determination of Capital Structure

Cost of capital influences the capital structure of a firm. In designing optimum capital structure that is the proportion of debt and equity, due importance is given to the overall or weighted average cost of capital of the firm. The objective of the firm should be to choose such a mix of debt and equity so that the overall cost of capital is minimised.

7. Evaluation of Financial Performance

The concept of cost of capital can be used to evaluate the financial performance of top management. This can be done by comparing the actual profitability of the investment project undertaken by the firm with the overall cost of capital.

2.5 Classification of Cost of Capital

Cost of capital can be classified as follows:

i) Historical Cost and Future Cost

Historical costs are book costs relating to the past, while future costs are estimated costs. Future costs are more relevant than historical costs in financial decision-making, whereas historical costs act as guide for estimation of future costs.

ii) Specific Costs and Composite Cost

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

iii) Explicit and Implicit Cost

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

$$I_0 = \frac{C_1}{(I+K)^1} + \frac{C_2}{(I+K)^2} + \dots + \frac{C_n}{(I+K)^n}$$

I_0 = Net cash inflow received at zero point of time.

C = Cash outflow in the period concerned.

K = Explicit cost of capital.

n = Duration of time period.

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

iv) Average Cost and Marginal Cost

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

2.6 Determination of Cost of Capital

As stated already, cost of capital plays a very important role in making decisions relating to financial management. However, its determination is not an easy task. It involves the following problems.

i) Problems in Determination of Cost of Capital

- ✓ Conceptual controversy regarding the relationship between cost of capital and capital structure is a big problem.
- ✓ Controversy regarding the relevance or otherwise of historic costs or future costs in decision making process.
- ✓ Computation of cost of equity capital depends upon the expected rate of return by its investors. But the quantification of expectations of equity shareholders is a very difficult task.
- ✓ Retained earnings has the opportunity cost of dividends foregone by the shareholders. Since different shareholders may have different opportunities for reinvesting dividends, it is very difficult to compute cost of retained earnings.
- ✓ Whether to use book value or market value weights in determining weighted average cost of capital poses another problem.

ii) Computation of Cost of Capital

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

- ✓ Computation of cost of specific source of capital, viz., debt, preference capital, equity and retained earnings, and
- ✓ Computation of weighted average cost of capital.

2.7 Cost of Equity capital (K_e):

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

- ✓ External equity or new issue of equity shares.
- ✓ Retained earnings.

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

i) Dividend Yield / Dividend Price Approach

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

$$K_e = D/NP \text{ (For new equity shares)}$$

Or

$$K_e = D/MP \text{ (For existing shares)}$$

Where, K_e = Cost of equity

D = Expected Dividend Per Share

NP = Net Proceeds Per Share

MP = Market Price Per Share

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

Illustration 1

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

Solution:

$$K_e = D/NP = \text{Rs. } 20/\text{Rs. } 110 \times 100 = 18.18\%$$

If the market price per share = Rs. 150.

$$K_e = D/MP = \text{Rs. } 20/\text{Rs. } 150 \times 100 = 13.33\%$$

ii) Dividend Yield plus Growth in Dividend Method

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

Cost of equity is calculated as :

$$K_e = \frac{D_1}{NP} + g \quad (\text{for new equity issue})$$

Where

D_1 = expected dividend per share at the end of the year. [$D_1 = D_0 (1+g)$]

NP = net proceeds per share

g = growth in dividends

Cost of equity for existing shares is calculated as:

$$\frac{D_1}{MP} + g$$

Where,

MP = market price per share.

Illustration 2

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

If the current market price of the share is Rs. 15. Calculate the cost of existing equity share capital.

Solution:

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

$$K_e = 1/(10 - .50) + 0.05 = 1/9.5 + 0.05$$

$$= 0.1053 + 0.05$$

$$= 0.1553 \text{ or } 15.53\%$$

Cost of existing equity shares: $K_e = D/MP + g$

$$K_e = 1/\text{Rs. } 15 + 0.05 = 0.0667 + 0.05 = 0.1167 \text{ or } 11.67\%$$

iii) Earnings Yield Method

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

$$i) \quad K_e = \frac{\text{Earnings per share}}{\text{Net proceeds}} = \frac{EPS}{NP} \text{ [For new shares]}$$

$$ii) \quad K_e = \frac{EPS}{MP} \text{ [for existing equity]}$$

Illustration 3

XYZ Ltd is planning for an expenditure of Rs. 120 lakhs for its expansion programme. No. of existing equity shares are 20 lakhs and the market value of equity share is Rs. 60. It has net earnings of Rs. 180 lakhs.

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

Solution:

$$a) \quad \text{Cost of existing equity} = (K_e) = \frac{EPS}{MP}$$

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

$$\therefore K_e = \frac{9}{60} = 0.15 \text{ or } 15\%$$

$$b) \quad \text{Cost of new equity capital: } (K_e) = \frac{EPS}{NP} = \frac{9}{52-2} = \frac{9}{50} = 0.18 \text{ or } 18\%$$

iv) Realized Yield Method

One of the major limitations of using dividend yield or earnings yield methods is that it is not possible to estimate future dividends and earnings correctly. To remove this drawback,

realized yield method may be used. This method takes into account the actual rate of return realized in the past. The dividend received in the past and the gain realized at the time of sale of shares should be considered for the calculation of the average rate of return. This approach gives fairly good results in case of companies with stable dividends and growth record.

2.8 Cost of Preference Share Capital

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

1. Perpetual Preference Capital:

a) If issued at par: $K_p = D/P$

K_p = Cost of preference capital

D = Annual preference dividend

P = Proceeds at par value

b) If issued at premium or discount:

$K_p = D/NP$

Where,

NP = Net Proceeds

Illustration 4

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

Solution : Cost of preference capital, $(K_p) = \frac{D}{NP}$

a) When issued at par :

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

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

b) When issued at 10% premium :

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

c) When issued at 5% discount :

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

2. Redeemable preference shares: It is calculated with the following formula:

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

Where, K_p = Cost of preference capital

D = Annual preference dividend

MV = Maturity value of preference shares

NP = Net proceeds of preference shares

Illustration 5

A company issues 1,00,000 10% preference shares of Rs. 10 each. Calculate the cost of preference capital if it is redeemable after 10 years. a) at par b) at 5% premium.

Solution:

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

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

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

b) If redeemable at a premium of 5% $K_p = \frac{Rs.1,00,000 + \frac{1}{10}(10,50,000 - 10,00,000)}{\frac{1}{2}(10,50,000 + 10,00,000)} \times 100$

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

2.9 Cost of Debt (k_d)

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

1. Perpetual/Irredeemable debt:

At par:

$$k_d = \text{Cost of debt before tax} = I/P_o$$

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

$$k_d (\text{after-tax}) = I/P (1 - t)$$

Where T = Tax rate

Illustration 6

- i) A Ltd., issues Rs. 50,000 debentures of 8% at par. The tax rate is 50%. Determine the after tax cost of debt.

$$k_d (\text{before tax}) = \frac{\text{Rs. } 4000}{\text{Rs. } 50,000} \times 100 = 8\%$$

$$k_d (\text{after tax}) = k_d (\text{before tax}) \times (1 - T) = 8\% (1 - .5) = 4\%$$

- ii) At premium or discount:

$$k_d (\text{before tax}) = \frac{I}{NP} \quad \text{where } I = \text{Interest}$$

NP = net proceeds.

$$k_d (\text{after tax}) = \frac{I}{NP} (1-t)$$

Illustration 7

B Ltd has Rs. 50,000, 8% debentures at a premium of 10%. The tax rate applicable to the company is 40%. Compute the after tax cost of debt.

$$\text{Answer : } k_d (\text{before - tax}) = \frac{I}{NP} = \frac{Rs. 4,000}{55,000} \times 100 = 7.27\%$$

$$k_d (\text{after-tax}) = \frac{I}{NP} (I - t) = \frac{Rs. 4,000}{55,000} \times (1 - .4) = 4.36\%$$

Illustration 8

X Ltd has Rs. 1,00,000, 10% debentures issued at 5% discount. The tax rate is 40%.

Compute the after tax cost of debt.

$$\text{Answer : } k_d (\text{before - tax}) = \frac{I}{NP} = \frac{Rs. 10,000}{Rs. 95,000} = 0.1053 \text{ or } 10.53\%$$

$$k_d (\text{after - tax}) = k_d (\text{before tax}) \times (1 - t) = 10.53 \times (1 - .4) = 10.53 \times .6 = 6.32\%$$

2. Redeemable debt:

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

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

I = interest; P = proceeds at par;

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

$$\text{ii) After tax cost of debt} = \text{Before - tax cost of debt} \times (1 - t)$$

Illustration 9

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

Solution

$$\begin{aligned} \text{Before tax cost of debt} &= \frac{I + \frac{1}{n}(P - NP)}{\frac{1}{2}(P + NP)} \\ &= \frac{10,000 + \frac{1}{5}(1,00,000 - 92,000)}{\frac{1}{2}(1,00,000 + 92,000)} = \frac{10,000 + 1600}{96,000} = \frac{11,600}{96,000} = 12.08\% \end{aligned}$$

$$[NP = 1,00,000 - 5,000 - 3,000 = 92,000]$$

$$\text{After tax cost of debt} = \text{Before - tax cost} \times (1-t) = 12.08 \times (1-.5) = 6.04\%$$

2.10 Cost of Retained Earnings (K_r)

Retained earnings refer to undistributed profits of a firm. Out of the total, earnings, firms generally distribute only a part of them in the form of dividends and the rest will be retained within the firms. Since no dividend is required to be paid on retained earnings, some people feel that 'retained earnings carry no cost'. But this approach is not appropriate. Retained earnings has the opportunity cost of dividends foregone by the investors. The rate of return that could have been earned by investors by investing dividends in alternative investments becomes cost of

retained earnings. Hence, shareholders expect a return on retained earnings at least equal to cost of equity.

$$\therefore K_r = K_e = \frac{D}{NP} + g$$

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

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

Where,

K_r = cost of retained earning

K_e = cost of equity

t = rate of tax

b = cost of purchasing new securities or brokerage cost.

Illustration 10

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

Solution:

$$\begin{aligned} \text{Cost of retained earnings} = (K_r) &= K_e (1-t) (1-b) = 18 (1-.30) (1-.02) \\ &= 18 \times .7 \times .98 = 12.35\% \end{aligned}$$

2.11 Weighted Average Cost of Capital (K_w)

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

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

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

- 1) Market value
- 2) Book Value

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

- ✓ market values are subject to frequent fluctuations.
- ✓ equity capital gets more importance, with the use of market value weights.

moreover, book values are readily available.

average cost of capital is computed as follows

$$K_w = \frac{\sum xw}{\sum W}$$

Where, K_w = weighted average cost of capital

x = cost of specific source of finance

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

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

- i) multiply the cost of each source with the corresponding weight.
- ii) add all these weighted costs so that weighted average cost of capital is obtained.

Illustration 11

From the following capital structure and after - tax cost for different sources of funds, compute the weighted average cost of capital of a firm.

| Source of funds | Amount Rs. | After - tax cost of capitals |
|--------------------------|------------|------------------------------|
| Equity capital | 4,50,000 | 0.14 |
| Retained earnings | 1,50,000 | 0.13 |
| Preference share capital | 1,00,000 | 0.10 |
| Debentures | 3,00,000 | 0.5 |

Solution:

Computation of Weighted Average Cost of Capital

| Sources of funds (1) | Amount (2) (Rs.) | Proportion (3) | After - tax (4) | Weighted cost (5) (3 x 4 = 5) |
|-------------------------|---------------------|-------------------|--------------------|----------------------------------|
| Equity capital | 4,50,000 | .45 | 14% | 6.30 |
| Retained Earnings | 1,50,000 | .15 | 13% | 1.95 |
| Preference capital | 1,00,000 | .10 | 10% | 1.00 |
| Debentures | 3,00,000 | .30 | 5% | 1.50 |
| Total | 10,00,000 | | | 10.75 |

∴ Weighted average cost of capital = 10.75%

Illustration 12

Following are the details regarding the capital structure of a company:

| Sources of funds | Book Value Rs. | Market Value Rs. | Specific cost of capital |
|--------------------|-------------------|---------------------|-----------------------------|
| Debentures | 4,00,000 | 3,80,000 | 5% |
| Preference Capital | 1,00,000 | 1,10,000 | 8% |
| Equity Capital | 6,00,000 | 12,00,000 | 13% |
| Retained Earnings | 2,00,000 | | 9% |
| Total | 13,00,000 | 16,90,000 | |

You are required to determine the weighted average cost of capital using (i) book value weights, (ii) market value weights.

Solutions:

i) Computation of Weighted Average Cost of Capital Using Book Value Weights:

| Sources of funds (1) | Amount (2) (Rs.) | Proportion (3) | After - tax (4) | Weighted cost (5) (3 x 4 = 5) |
|-------------------------|---------------------|-------------------|--------------------|----------------------------------|
| Debentures | 4,00,000 | 0.31 | 5% | 1.55 |
| Preference Capital | 1,00,000 | 0.08 | 8% | 0.64 |
| Equity Capital | 6,00,000 | 0.46 | 13% | 5.98 |
| Retained Earnings | 2,00,000 | 0.15 | 9% | 1.35 |
| Total | 13,00,000 | 1.00 | | 9.52 |

Weighted average cost of capital = 9.52%

ii) Computation of Weighted Average Cost of Capital by Using Market Value Weights:

| Sources of funds (1) | Amount (2) (Rs.) | Proportion (3) | After - tax cost of capital (4) | Weighted cost (5) (3 x 4 = 5) |
|---------------------------------|-----------------------------|---------------------------|--|--|
| Debentures | 3,80,000 | 0.23 | 5% | 1.15 |
| Preference Capital | 1,10,000 | 0.07 | 8% | 0.56 |
| Equity Capital | 9,00,000 | 0.53 | 13% | 6.89 |
| Retained Earnings | 3,00,000 | 0.17 | 9% | 1.53 |
| Total | 16,90,000 | 1.00 | | 10.13 |

Weighted average cost of capital = 10.13%

Check Your Progress

Choose the Correct Answer:

1. Cost of capital refers to:

- a) Cost of production
- b) Minimum rate of return required by investors
- c) Selling price of a product
- d) Cost of marketing

Answer: b) Minimum rate of return required by investors

2. Cost of equity share capital is the return required by:

- a) Debenture holders
- b) Equity shareholders
- c) Creditors
- d) Employees

Answer: b) Equity shareholders

3. Preference share capital provides:

- a) Fixed dividend
- b) Variable dividend
- c) No dividend
- d) Interest

Answer: a) Fixed dividend

4. Cost of debt is the interest paid on:

- a) Equity shares
- b) Preference shares
- c) Borrowed funds
- d) Retained earnings

Answer: c) Borrowed funds

5. Retained earnings represent:

- a) Borrowed funds
- b) Undistributed profits of a company
- c) Bank loans
- d) Preference shares

Answer: b) Undistributed profits of a company

6. Weighted Average Cost of Capital (WACC) means:

- a) Average cost of all sources of capital
- b) Cost of debt only
- c) Cost of equity only
- d) Cost of retained earnings only

Answer: a) Average cost of all sources of capital

7. Which of the following is usually the cheapest source of finance?

- a) Equity shares
- b) Preference shares
- c) Debt
- d) Retained earnings

Answer: c) Debt

8. Cost of preference share capital is calculated based on:

- a) Dividend paid to preference shareholders
- b) Interest on loans
- c) Profit of the company
- d) Sales revenue

Answer: a) Dividend paid to preference shareholders

9. WACC is also known as:

- a) Marginal cost of capital
- b) Composite cost of capital
- c) Average profit
- d) Fixed cost of capital

Answer: b) Composite cost of capital

10. Cost of retained earnings is similar to the cost of:

- a) Debt capital
- b) Equity share capital

c) Preference share capital

d) Bank loan

Answer: b) Equity share capital

Small Questions – LOCF Mapping Table

| S.No | Small Question | CO | Bloom's Level | PO |
|------|--|-----|---------------|-----|
| 1 | Define Cost of Capital. | CO1 | Remembering | PO1 |
| 2 | State any two factors affecting Cost of Capital. | CO1 | Understanding | PO1 |
| 3 | What is meant by Cost of Equity? | CO2 | Understanding | PO2 |
| 4 | A firm has Equity ₹3,00,000 and Preference Shares ₹1,00,000 with Dividend ₹20,000. Calculate the Cost of Preference Share Capital. | CO3 | Applying | PO2 |
| 5 | If a firm has Debt ₹2,00,000 at 10% interest, calculate the after-tax Cost of Debt assuming tax rate is 30%. | CO3 | Applying | PO3 |

Big Questions – LOCF Mapping Table

| S.No | Big Question | CO | Bloom's Level | PO |
|------|---|-----|---------------|-----|
| 1 | Explain the concept and significance of Cost of Capital. | CO1 | Understanding | PO1 |
| 2 | Discuss the factors affecting the Cost of Equity and Cost of Debt. | CO1 | Analyzing | PO1 |
| 3 | Explain the methods to calculate Cost of Equity (Dividend Growth Model and CAPM). | CO2 | Understanding | PO2 |
| 4 | A firm has Equity ₹4,00,000, Debt ₹2,00,000 (10% interest) and Preference Shares ₹1,00,000 (Dividend ₹15,000). Calculate the Weighted Average Cost of Capital (WACC) assuming tax rate 30%. | CO3 | Applying | PO3 |
| 5 | Discuss the relevance of WACC in capital budgeting decisions. | CO3 | Evaluating | PO3 |

UNIT – IV

CAPITAL BUDGETING

Structure:

4.1 Introduction

4.2 Meaning of Capital Budgeting

4.3 Definitions

4.4 Nature of Capital Budgeting

4.5 Importance of Capital Budgeting

4.6 Factors (Criteria) Influencing Capital Expenditure Decisions

4.7 Advantages of Capital Budgeting

4.8 Disadvantages / Limitations of Capital Budgeting

4.9 Purpose of Capital Budgeting

4.10 Capital Budgeting Process

4.11 Types of Capital Investment Decisions

4.12 Capital Budgeting Techniques

4.1 Introduction

Capital Budgeting: Capital budgeting is the process of making investment decision in long-term assets or courses of action. Capital expenditure incurred today is expected to bring its benefits over a period of time. These expenditures are related to the acquisition & improvement of fixed assets.

Capital budgeting is the planning of expenditure and the benefit, which spread over a number of years. It is the process of deciding whether or not to invest in a particular project, as the investment possibilities may not be rewarding. The manager has to choose a project, which

gives a rate of return, which is more than the cost of financing the project. For this the manager has to evaluate the worth of the projects in-terms of cost and benefits. The benefits are the expected cash inflows from the project, which are discounted against a standard, generally the cost of capital.

4.2 Meaning of Capital Budgeting

Capital budgeting means planning the capital expenditure in acquisition of fixed (capital) assets such as land, building, plant or new projects as a whole. It includes replacing and modernising a process. introducing a new product and expansion of the business. It involves the preparation of Detailed Project Report (DPR) and cost and revenue statements indicating the profitability. The project which gives the highest return on investment is to be selected and then investment is to be made in such a project as to maximise the profitability of the firm.

4.3 Definitions

According to Charles T. Horngren, “Capital Budgeting is long-term planning for making and financing proposed capital outlays.”

According to L.J. Gitman, “Capital Budgeting refers to the total process of generating, evaluating, selecting and following up on capital expenditure alternatives.”

According to Richards & Greenlaw “The capital budgeting generally refers to acquiring inputs with long term returns”

According to Milton H. Spencer “Capital budgeting involves the planning of expenditure for assets, the returns of which will be realised in future time periods”

Capital budgeting may be defined as the decision-making process by which, firms evaluate the purchase of major fixed assets, including buildings, machinery, and equipment. It also covers decisions to acquire other firms, either through the purchase of their common stock

or groups of assets that can be used to conduct an ongoing business. Capital budgeting scribes the firm's formal planning process for the acquisition and investment of capital and results in a capital budget that is the firm's formal plan for the expenditure of money to purchased assets.

A capital-budgeting decision is a two-sided process. First, the analyst must evaluate a proposed project to calculate the likely or expected return from the project. This calculation generally begins with expenditure of the project's service life and a stream of cash flowing into the firm over the life of the project.

4.4 Nature of Capital Budgeting

- ✓ It is a long-term investment decision.
- ✓ It is irreversible in nature.
- ✓ It requires a large amount of funds.
- ✓ It is most critical and complicated decision for a finance manager.
- ✓ It involves an element of risk as the investment is to be recovered in future.

4.5 Importance of Capital Budgeting

All capital expenditure projects involve heavy investment of funds, the firm from various external and internal sources raises these funds .hence it is important for a firm to plan its capital expenditure.

1. Permanent Commitment of Funds

The funds capital expenditure projects are not only huge but more or less permanently blocked These are long term decision .The longer the time the greater the risk is involved Hence careful planning is essential.

2. Irreversible In Nature

In most cases, capital budgeting decision are irreversible .once the decision for acquiring a permanent assets is taken, it is very difficult to reverse the decision .This is because it is difficult to dispose the assets without incurring heavy losses.

3. Growth and Expansion

Business firm grow, expand, diversify and acquire stature in the industry through their capital budgeting activities. The success of mobilization and deployment of funds determines .the future of a firm.

4. Multiplicity of Variables

Large number of factors affect the decision on capital expenditure ,They make the capital expenditure decision the most difficult to make.

5. Top Management Activity

The net result of capital expenditure' decisions automatically trusts them on the top management. Only senior managerial personnel can take these decisions and boar responsibility for them.

4.6 Factors (Criteria) Influencing Capital Expenditure Decisions

1. Availability of Funds

This is the crucial factor affecting all capital expenditure decisions However attractive, some projects cannot be taken up if they are too big for a firm to mobilize the needed funds.

2. Future Earnings

Every project has to result in cash inflows. The extent of the revenue's anticipated is the most significant factor which affects the choice of a project.

3. Degree of Uncertainty or Risk

This level of risk involved in a project is vital for deciding its desirability

4. Urgency

Projects which are to be immediately taken up for firm's survival have to be treated differently from optional projects.

5. Obsolescence

If obsolete machinery and plant exist in a firm, their replacement becomes a compulsion.

6. Competitors Activities

When competitors perform certain activities, they compel a firm to undertake similar activities to withstand competition.

7. Intangible Factors

Firm's prestige, workers' safety, social welfare etc, influence Capital budgeting which may be deemed as emotional factors.

4.7 Advantages of Capital Budgeting

1. Evaluates Investment Plans

Capital budgeting is a key tool used by management for the evaluation of investment projects. It assists in taking decisions regarding long term investments by properly analyzing investment opportunities. Using the capital budgeting techniques-risk, return and investment amount of each project is examined.

2. Identify Risk

It enables in identifying the risk associated with investment plans. Capital budgeting examines the project from different aspects to find out all possible losses and risks. It studies

how these risks affect the return and growth of the business which are helpful in making an appropriate decision.

3. Chooses Investment Wisely

Capital budgeting plays an effective role in selecting a profitable investment project for the business. It is the one that decides whether a particular project is beneficial to take or not. This technique considers cash flows of investment proposal during its entire life for finding out its profitability. Companies are able to choose investment wisely by analyzing different factors in a competitive market using capital budgeting techniques.

4. Avoid Over and Under Investment

Managers use capital budgeting techniques to determine the appropriate investment amount for the business. The right amount of investment is a must for every business for earning better returns and avoiding losses. Capital budgeting analyses the firm capability and objectives for determining the right investment accordingly.

5. Maximize Shareholder's Wealth

Capital budgeting assists in maximizing the overall value of shareholders. It is a tool that enables companies to deploy their funds in the most effective way possible thereby earning huge profits. Companies are able to select investments with higher returns and lower costs which eventually raises the shareholder's wealth.

6. Control Project Expenditure

Capital budgeting focuses on minimizing the expenditure of investment projects. While examining the investment proposals, it ensures that the project has an adequate amount of inflows for meeting out its expenses and provide an anticipated return. The selection of effective investment projects helps companies in controlling their expenditure and earning better profits.

4.8 Disadvantages / Limitations of Capital Budgeting

1. Irreversible Decisions

The major limitation with capital budgeting is that the decisions taken through this process are long-term and irreversible in nature. Decisions have an impact on the long term durability of the company and require the utmost care while taking them. Any wrong capital budgeting decision would have an adverse effect on profitability and continuity of business.

2. Rely on Assumptions and Estimations

Capital budgeting techniques rely on different assumptions and estimations for analyzing investment projects. Annual cash flow and life of project estimated is not always true and may increase or decrease than the anticipated values. Decisions taken on the basis of these untrue estimations may lead businesses to losses.

3. Higher Risk

Capital budgeting decisions are riskier in nature as it involves a large amount of capital expenditure. These decisions require the utmost care as it affects the success or failure of every business. Any wrong decisions regarding allotment of funds may lead the business to substantial losses or eventually cause a complete shutdown.

4. Uncertainty

This process is dependent upon futuristic data which is uncertain for analyzing the investment proposals. Capital budgeting anticipates the future cash inflows and outflows of the project for determining its profitability. The future is always uncertain and data may prove untrue which leads to wrong decisions.

5. Ignores Non-Financial Aspects

Capital budgeting technique considers only financial aspects and ignores all non-financial aspects while analyzing the investment plans. Non-financial factors have an efficient role in the success and profitability of the project. The real profitability of the project cannot be determined by ignoring these factors.

4.9 Purpose of Capital Budgeting

The capital budgeting decisions are important, crucial and critical business decisions due to following reasons:

1. Substantial Expenditure

Capital budgeting decisions involves the investment of substantial amount of funds. It is therefore necessary for a firm to make such decisions after a thoughtful consideration so as to result in the profitable use of its scarce resources. The hasty and incorrect decisions would not only result into huge losses but may also account for the failure of the firm.

2. Long Time Period

The capital budgeting decision has its effect over a long period of time. These decisions not only affect the future benefits and costs of the firm but also influence the rate and direction of growth of the firm.

3. Irreversibility

Most of the investment decisions are irreversible. Once they are taken, the firm may not be in a position to reverse them back. This is because, as it is difficult to find a buyer for the second-hand capital items.

4. Complex Decision

The capital investment decision involves an assessment of future events, which in fact is difficult to predict. Further it is quite difficult to estimate in quantitative terms all the benefits or the costs relating to a particular investment decision.

4.10 Capital Budgeting Process

The extent to which the capital budgeting process needs to be formalised and systematic procedures established depends on the size of the organisation; number of projects to be considered; direct financial benefit of each project considered by itself; the composition of the firm's existing assets and management's desire to change that composition; timing of expenditures associated with the projects that are finally accepted.

1. Planning

The capital budgeting process begins with the identification of potential investment opportunities. The opportunity then enters the planning phase when the potential effect on the firm's fortunes is assessed and the ability of the management of the firm to exploit the opportunity is determined. Opportunities having little merit are rejected and promising opportunities are advanced in the form of a proposal to enter the evaluation phase.

2. Evaluation

This phase involves the determination of proposal and its investments, inflows and outflows. Investment appraisal techniques, ranging from the simple payback method and accounting rate of return to the more sophisticated discounted cash flow techniques, are used to appraise the proposals. The technique selected should be the one that enables the manager to make the best decision in the light of prevailing circumstances.

3. Selection

Considering the returns and risks associated with the individual projects as well as the cost of capital to the organisation, the organisation will choose among projects so as to maximise shareholders' wealth.

4. Implementation

When the final selection has been made, the firm must acquire the necessary funds, purchase the assets, and begin the implementation of the project.

5. Control

The progress of the project is monitored with the aid of feedback reports. These reports will include capital expenditure progress reports, performance reports comparing actual performance against plans set and post completion audits.

6. Review

When a project terminates, or even before, the organisation should review the entire project to explain its success or failure. This phase may have implication for firms planning and evaluation procedures. Further, the review may produce ideas for new proposals to be undertaken in the future.

4.11 Types of Capital Investment Decisions

There are many ways to classify the capital budgeting decision. Generally capital investment decisions are classified in two ways. One way is to classify them on the basis of firm's existence. Another way is to classify them on the basis of decision situation.

(i) On the Basis of Firm's Existence:

The capital budgeting decisions are taken by both newly incorporated firms as well as by existing firms. The new firms may be required to take decision in respect of selection of a plant

to be installed. The existing firm may be required to take decisions to meet the requirement of new environment or to face the challenges of competition. These decisions may be classified as follows:

1. Replacement and Modernisation Decisions

The replacement and modernisation decisions aim at to improve operating efficiency and to reduce cost. Generally all types of plant and machinery require replacement either because of the economic life of the plant or machinery is over or because it has become technologically outdated. The former decision is known as replacement decisions and later one is known as modernisation decisions. Both replacement and modernisation decisions are called cost reduction decisions.

2. Expansion Decisions

Existing successful firms may experience growth in demand of their product line. If such firms experience shortage or delay in the delivery of their products due to inadequate production facilities, they may consider proposal to add capacity to existing product line.

3. Diversification Decisions

These decisions require evaluation of proposals to diversify into new product lines, new markets etc. for reducing the risk of failure by dealing in different products or by operating in several markets. Both expansion and diversification decisions are called revenue expansion decisions.

(ii) On the Basis of Decision Situation:

The capital budgeting decisions on the basis of decision situation are classified as follows:

1. Mutually Exclusive Decisions

The decisions are said to be mutually exclusive if two or more alternative proposals are such that the acceptance of one proposal will exclude the acceptance of the other alternative proposals. For instance, a firm may be considering proposal to install a semi-automatic or highly automatic machine. If the firm install a semi-automatic machine it exclude the acceptance of proposal to install highly automatic machine.

2. Accept-Reject Decisions

The accept-reject decisions occur when proposals are independent and do not compete with each other. The firm may accept or reject a proposal on the basis of a minimum return on the required investment. All those proposals which give a higher return than certain desired rate of return are accepted and the rest are rejected.

3. Contingent Decisions

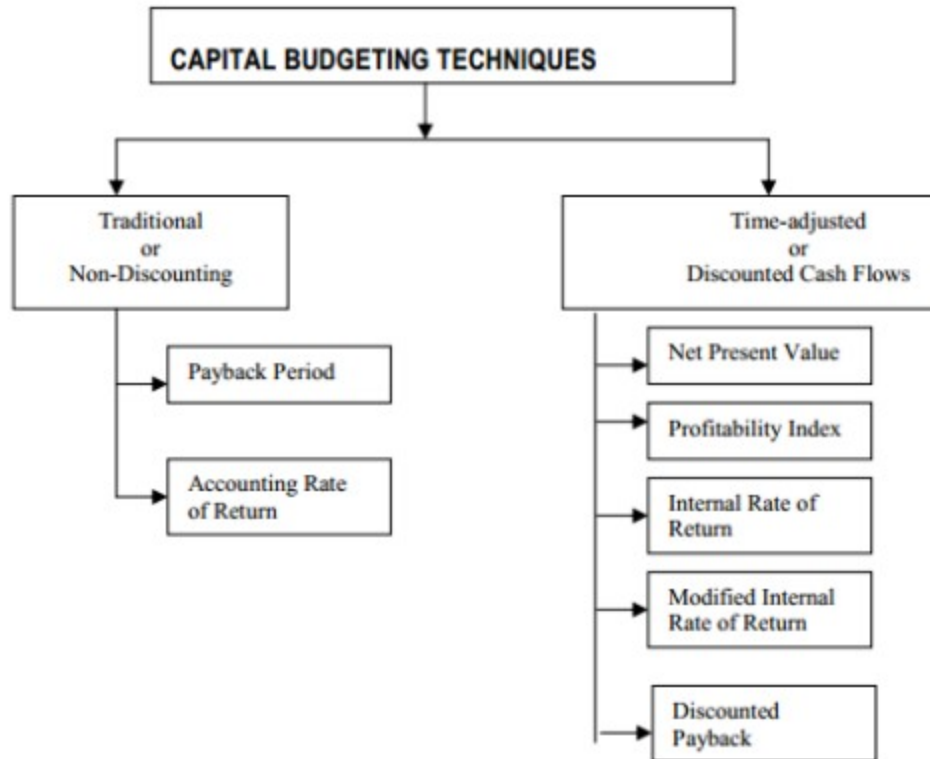
The contingent decisions are dependable proposals. The investment in one proposal requires investment in one or more other proposals. For example if a company accepts a proposal to set up a factory in remote area it may have to invest in infrastructure also e.g. building of roads, houses for employees etc.

4.12 Capital Budgeting Techniques

In order to maximise the return to the shareholders of a company, it is important that the best or most profitable investment projects are selected. Because the results for making a bad long-term investment decision can be both financially and strategically devastating, particular care needs to be taken with investment project selection and evaluation. There are a number of techniques available for appraisal of investment proposals and can be classified as presented below:

Figure 4.1

Capital Budgeting Techniques



Organizations may use any or more of capital investment evaluation techniques; some organizations use different methods for different types of projects while others may use multiple methods for evaluating each project. These techniques have been discussed below – Net present value, profitability index, internal rate of return, modified internal rate of return, payback period, and accounting (book) rate of return.

(i) Accounting or Average Rate of Return

Accounting Rate of Return (ARR) is the average net income an asset is expected to generate divided by its average capital cost, expressed as an annual percentage. They typically include situations where companies are deciding on whether or not to proceed with a specific

investment (a project, an acquisition, etc.) based on the future net earnings expected compared to the capital cost. This method called accounting rate of return method because it fees the accounting concept of profit. i.e. income after depreciation and tax as the criterion for calculation of return.

According to “Soloman” accounting rate of return on an investment can be calculated as the ratio of accounting net income to the initial investment.

Merits:

- ✓ This method is easy to understand and simple to calculate.
- ✓ This method takes into account the earnings over the entire economic life of the project.
- ✓ It is really a profitability concept since it considers net earnings after depreciation.
- ✓ This method is in consistent with the conventional accounting system and easy to comprehend as it based on percentages.

Demerits:

- ✓ It ignores time value of money.
- ✓ This method ignores the risk and uncertainty factors.
- ✓ It uses accounting profits and not the cash inflows in appraising the project.
- ✓ It considers only the rate of return and not the life of the project.
- ✓ Two formulas are used to compute this method. Each method gives different results. This reduces the reliability of the method.

Illustration 1: Determine the average rate of return from the following data of two machines A and B.

| Year | Machine A | Machine B |
|---|---------------|---------------|
| Original Cost | Rs. 56, 125 | Rs. 56, 125 |
| Addl. Investment in net working capital | 5000 | 6,000 |
| Estimated life in years | 5 | 5 |
| Estimated salvage value | 3,000 | 3,000 |
| Average income – tax rate | 55% | 55% |
| Annual Estimated Income After Depr. and Tax: | | |
| 1 st Year | 3,375 | 11,375 |
| 2 nd Year | 5,375 | 9,375 |
| 3 rd Year | 7,375 | 7,375 |
| 4 th Year | 9,375 | 5,375 |
| 5 th Year | 11,375 | 3,375 |
| | 36,875 | 36,875 |

Depreciation has been charged on straight line basis.

Solution:

$$\text{ARR} = \text{Average Earnings} / \text{Average Investment} \times 100$$

$$\text{Average Income} = \text{Total Income} / \text{Number of Years}$$

$$\text{Machine A} = \text{Rs. } 36,875 / 5 = \text{Rs. } 7,375$$

$$\text{Machine B} = \text{Rs. } 36,875 / 5 = \text{Rs. } 7,375$$

$$\text{Average Investment} = \frac{\text{Original Investment} - \text{Scrap Value}}{2} + \text{Additional Net Working Capital} + \text{Scrap Value}$$

$$\text{Machine A} = \frac{56,125 - 3,000}{2} + \text{Rs. } 5,000 + \text{Rs. } 3,000$$

$$= 26,562.50 + 8,000 = \text{Rs. } 34,562.50$$

$$\begin{aligned} \text{Machine A} &= 56,125 - 3,000 / 2 + \text{Rs. } 6,000 + \text{Rs. } 3,000 \\ &= 26,562.50 + \text{Rs. } 9,000 = \text{Rs. } 35,562.50 \end{aligned}$$

$$\text{ARR for Machine A} = \text{Rs. } 7,375 / 34,562.50 \times 100 = 21.34\%$$

$$\text{ARR for Machine B} = \text{Rs. } 7,375 / 34,562.50 \times 100 = 20.74\%$$

(ii) Payback Period

The payback period of an investment is the length of time required for the cumulative total net cash flows from the investment to equal the total initial cash outlays. At that point in time, the investor has recovered the money invested in the project.

Steps:

(a) The first steps in calculating the payback period is determining the total initial capital investment and

(b) The second step is calculating/estimating the annual expected after-tax net cash flows over the useful life of the investment.

1. When the net cash flows are uniform over the useful life of the project, the number of years in the payback period can be calculated using the following equation:

$$\text{Pay Back Period} = \frac{\text{Total Initial Capital Investment}}{\text{Annual expected after tax net cash inflow}}$$

2. When the annual expected after-tax net cash flows are not uniform, the cumulative cash inflow from operations must be calculated for each year by subtracting cash outlays for operations and taxes from cash inflows and summing the results until the total is equal to the initial capital investment. For the last year we need to compute the fraction of the year that is needed to complete the total payback.

Advantages:

- ✓ It is easy to compute.
- ✓ It is easy to understand as it provides a quick estimate of the time needed for the organization to recoup the cash invested.
- ✓ The length of the payback period can also serve as an estimate of a project's risk; the longer the payback period, the riskier the project as long-term predictions are less reliable. In some industries with high obsolescence risk or in situations where an organization is short on cash, short payback periods often become the determining factor for investments.

Limitations:

- ✓ It ignores the time value of money. As long as the payback periods for two projects are the same, the payback period technique considers them equal as investments, even if one project generates most of its net cash inflows in the early years of the project while the other project generates most of its net cash inflows in the latter years of the payback period.
- ✓ A second limitation of this technique is its failure to consider an investment's total profitability; it only considers cash flows from the initiation of the project until its payback period and ignores cash flows after the payback period
- ✓ Lastly, use of the payback period technique may cause organizations to place too much emphasis on short payback periods thereby ignoring the need to invest in long-term projects that would enhance its competitive position.

Illustration 2: A project cost 1,00,000 and yields an annual cash inflow of 20,000 for 8 years, calculate payback period

(a) When Annual Cash Inflow are Equal

$$\text{Pay back period} = \frac{\text{Original cost of the project (cash outlay)}}{\text{Annual net cash inflow (net earnings)}}$$

Solution:

$$1,00,000 / 20,000 = 5 \text{ Years}$$

(b) When Annual Cash Inflows are Unequal

It is ascertained by cumulating cash inflows till the time when the cumulative cash inflows become equal to initial investment.

$$\text{Pay back period} = Y + \frac{B}{C}$$

Y=No of years immediately preceding the year of final recovery.

B=Balance amount still to be recovered.

C=Cash inflow during the year of final recovery.

Example: Initial Investment = 10,000 in a project

Expected future cash inflows 2000, 4000, 3000, 2000

Solution:

Calculation of Pay Back period

| Year | Cash inflows (Rs.) | Cumulative Cash inflows (Rs.) |
|------|--------------------|-------------------------------|
| 1 | 2,000 | 2,000 |
| 2 | 4,000 | 6,000 |
| 3 | 3,000 | 9,000 |
| 4 | 2,000 | 11,000 |

The initial investment is recovered between the 3rd and the 4th year.

$$\text{Pay back period} = Y + \frac{B}{C} = 3 + \frac{1000}{2000} \text{ years}$$

$$3 + \frac{1}{2} \text{ years} = 3 \text{ year 6 months}$$

Illustration 3: Suppose a project costs Rs. 20, 00,000 and yields annually a profit of Rs. 3, 00,000 after depreciation @ 12½% (straight line method) but before tax 50%. The first step would be to calculate the cash inflow from this project. The cash inflow is Rs. 4, 00,000 calculated as follows:

Solution:

| Particulars | Rs. |
|--------------------------------------|-----------------|
| Profit before tax | 3,00,000 |
| Less: Tax @ 50% | 1,50,000 |
| Profit after tax | 1,50,000 |
| Add: Depreciation written off | 2,50,000 |
| Total cash inflow | 4,00,000 |

While calculating cash inflow, depreciation is added back to profit after tax since it does not result in cash outflow. The cash generated from a project therefore is equal to profit after tax plus depreciation.

$$\text{Payback period} = \text{Rs. } 20,00,000 / 4,00,000 = 5 \text{ Years}$$

Illustration 4: There are two projects A and B. The cost of the project is Rs. 30,000 in each case. The cash inflows are as under:

| Year | Cash Inflows | |
|------|--------------|-----------|
| | Project A | Project B |
| 1 | Rs. 10,000 | Rs. 2,000 |
| 2 | 10,000 | 4,000 |
| 3 | 10,000 | 24,000 |

The pay – back period is 3 years in both the cases. However, project ‘A’ should be preferred as compared to project ‘B’ because of speedy recovery of the initial investment.

Illustration 5: A choice is to be made between two competing projects which require an equal investment of Rs. 50,000 and are expected to generate net cash flows as under:

| Year | Project 1 | Project 2 |
|------|------------|------------|
| 1 | Rs. 25,000 | Rs. 10,000 |
| 2 | 15,000 | 12,000 |
| 3 | 10,000 | 18,000 |
| 4 | Nil | 25,000 |
| 5 | 12,000 | 8,000 |
| 6 | 6,000 | 4,000 |

The cost of capital of the company is 10 percent. The following are the Present Value Factors @ 10% per annum:

| Year | P.V. Factors @ 10% p.a |
|------|------------------------|
| 1 | 0.909 |
| 2 | 0.826 |
| 3 | 0.751 |
| 4 | 0.683 |
| 5 | 0.621 |
| 6 | 0.564 |

Which project proposal should be chosen and why? Evaluate the project proposals under:

- (a) Pay – back Period and
- (b) Discounted Cash Flow methods.

Solution:**Pay – Back Period Method**

| Year | Project I | | Project II | |
|------|--------------|-------------------|--------------|-------------------|
| | Cash Inflows | Cum. Cash Inflows | Cash Inflows | Cum. Cash Inflows |
| 1 | Rs. 25,000 | Rs. 25,000 | Rs. 10,000 | Rs. 10,000 |
| 2 | 15,000 | 40,000 | 12,000 | 22,000 |
| 3 | 10,000 | 50,000 | 18,000 | 40,000 |
| 4 | Nil | 50,000 | 25,000 | 65,000 |
| 5 | 12,000 | 62,000 | 8,000 | 73,000 |
| 6 | 6,000 | 68,000 | 4,000 | 77,000 |

Project I has the pay – back period of 3 years while project II has a pay – back period of 3.4 years (i.e, Rs. 40,000 in 3 years and Rs. 10,000 in the 4th year). Thus, Project I has to be preferred because it has a shorter pay – back period.

Discounted Cash Flow Method

| Year | Project 1 | Discount Factor at 10% p.a | Present Value |
|--|------------|-------------------------------|---------------|
| 1 | Rs. 25,000 | 0.909 | Rs. 22,725 |
| 2 | 15,000 | 0.826 | 12,390 |
| 3 | 10,000 | 0.751 | 7,510 |
| 4 | Nil | 0.683 | - |
| 5 | 12,000 | 0.621 | 7,452 |
| 6 | 6,000 | 0.564 | 3,384 |
| Total Present Value of Future Cash Inflows | | | 53, 461 |
| Initial Investment | | | 50,000 |
| Net Present Value (NPV) | | | 3,461 |

| Year | Project II | Discount Factor at 10% p.a | Present Value |
|--|------------|-------------------------------|---------------|
| 1 | Rs. 10,000 | 0.909 | 9,090 |
| 2 | 12,000 | 0.826 | 9,912 |
| 3 | 18,000 | 0.751 | 13,518 |
| 4 | 25,000 | 0.683 | 17,075 |
| 5 | 8,000 | 0.621 | 4,968 |
| 6 | 4,000 | 0.564 | 2,256 |
| Total Present Value of Future Cash Inflows | | | 56,819 |
| Initial Investment | | | 50,000 |
| Net Present Value (NPV) | | | 6,819 |

Both projects need the same investment of Rs. 50,000. However, in case of Project I, there is a surplus of Rs. 3461, while in case of project II, there is a surplus of Rs. 6,819. Hence Project II is to be preferred.

(iii) Net Present Value Technique

The net present value technique is a discounted cash flow method that considers the time value of money in evaluating capital investments. An investment has cash flows throughout its life, and it is assumed that a rupee of cash flow in the early years of an investment is worth more than a rupee of cash flow in a later year.

The net present value method uses a specified discount rate to bring all subsequent net cash inflows after the initial investment to their present values (the time of the initial investment or year 0).

Determining Discount Rate

Theoretically, the discount rate or desired rate of return on an investment is the rate of return the firm would have earned by investing the same funds in the best available alternative investment that has the same risk. Determining the best alternative opportunity available is difficult in practical terms so rather than using the true opportunity cost, organizations often use an alternative measure for the desired rate of return. An organization may establish a minimum rate of return that all capital projects must meet; this minimum could be based on an industry average or the cost of other investment opportunities. Many organizations choose to use the overall cost of capital as the desired rate of return; the cost of capital is the cost that an organization has incurred in raising funds or expects to incur in raising the funds needed for an investment.

The net present value of a project is the amount, in current rupees, the investment earns after yielding the desired rate of return in each period.

$$\text{Net present value} = \text{Present value of net cash flow} - \text{Total net initial investment}$$

The steps to calculating net present value are:-

- ✓ Determine the net cash inflow in each year of the investment
- ✓ Select the desired rate of return
- ✓ Find the discount factor for each year based on the desired rate of return selected
- ✓ Determine the present values of the net cash flows by multiplying the cash flows by the discount factors
- ✓ Total the amounts for all years in the life of the project
- ✓ Lastly subtract the total net initial investment.

Illustration 6: Compute the net present value for a project with a net investment of Rs. 1, 00,000 and the following cash flows if the company's cost of capital is 10%? Net cash flows for year one is Rs. 55,000; for year two is Rs. 80,000 and for year three is Rs. 15,000. [PVIF @ 10% for three years are 0.909, 0.826 and 0.751]

Solution:

| Year | Net Cash Flows | PVIF @ 10% | Discounted Cash Flows |
|--------------------------------|----------------|------------|-----------------------|
| 1 | Rs. 55,000 | 0.909 | 49,995 |
| 2 | 80,000 | 0.826 | 66,080 |
| 3 | 15,000 | 0.751 | 11,265 |
| Total Discounted Cash Flows | | | 1,27,340 |
| Less: Net Investment | | | 1,00,000 |
| Net Present Value (NPV) | | | 27,340 |

Advantages

- ✓ NPV method takes into account the time value of money.
- ✓ The whole stream of cash flows is considered.
- ✓ The net present value can be seen as the addition to the wealth of share holders. The criterion of NPV is thus in conformity with basic financial objectives.
- ✓ The NPV uses the discounted cash flows i.e., expresses cash flows in terms of current rupees. The NPVs of different projects therefore can be compared. It implies that each project can be evaluated independent of others on its own merit.

Limitations

- ✓ It involves difficult calculations.

- ✓ The application of this method necessitates forecasting cash flows and the discount rate. Thus accuracy of NPV depends on accurate estimation of these two factors which may be quite difficult in practice.
- ✓ The ranking of projects depends on the discount rate.

(iv) Internal Rate of Return Method

The internal rate of return method considers the time value of money, the initial cash investment, and all cash flows from the investment. But unlike the net present value method, the internal rate of return method does not use the desired rate of return but estimates the discount rate that makes the present value of subsequent net cash flows equal to the initial investment. This discount rate is called IRR.

IRR Definition: Internal rate of return for an investment proposal is the discount rate that equates the present value of the expected net cash flows with the initial cash outflow. This IRR is then compared to a criterion rate of return that can be the organization’s desired rate of return for evaluating capital investments.

Illustration 7: Calculate the internal rate of return of an investment of Rs. 1, 36,000 which yields the following cash inflows:

| Year | Cash Inflows (in Rs.) |
|-------------|------------------------------|
| 1 | 30,000 |
| 2 | 40,000 |
| 3 | 60,000 |
| 4 | 30,000 |
| 5 | 20,000 |

Solution:

Calculation of IRR Since the cash inflow is not uniform, the internal rate of return will have to be calculated by the trial and error method. In order to have an approximate idea about such rate, the 'Factor' must be found out. 'The factor reflects the same relationship of investment and cash inflows as in case of payback calculations':

$$F = I / C$$

Where,

F = Factor to be located

I = Original Investment

C = Average Cash inflow per year

For the project,

$$\text{Factor} = 1,36,000 / 36,000 = \mathbf{3.78}$$

The factor thus calculated will be located in the present value of Re.1 received annually for N year's table corresponding to the estimated useful life of the asset. This would give the expected rate of return to be applied for discounting the cash inflows. In case of the project, the rate comes to 10%.

| Year | Cash Inflows (Rs.) | Discounting factor @ 10% | Present Value (Rs.) |
|----------------------------|-----------------------|-----------------------------|------------------------|
| 1 | 30,000 | 0.909 | 27,270 |
| 2 | 40,000 | 0.826 | 33,040 |
| 3 | 60,000 | 0.751 | 45,060 |
| 4 | 30,000 | 0.683 | 20,490 |
| 5 | 20,000 | 0.621 | 12,420 |
| Total present value | | | 1,38,280 |

The present value at 10% comes to Rs. 1,38,280, which is more than the initial investment. Therefore, a higher discount rate is suggested, say, 12%.

| Year | Cash Inflows (Rs.) | Discounting factor @ 12% | Present Value (Rs.) |
|----------------------------|--------------------|--------------------------|---------------------|
| 1 | 30,000 | 0.893 | 26,790 |
| 2 | 40,000 | 0.797 | 31,880 |
| 3 | 60,000 | 0.712 | 42,720 |
| 4 | 30,000 | 0.636 | 19,080 |
| 5 | 20,000 | 0.567 | 11,340 |
| Total present value | | | 131810 |

The internal rate of return is, thus, more than 10% but less than 12%. The exact rate can be obtained by interpolation:

$$\text{IRR} = 10 + \left[\frac{\text{Rs.}138280 - \text{Rs.}136000}{\text{Rs.}138280 - \text{Rs.}131810} \times 2 \right]$$

$$10 + \left[\frac{2280}{6470} \right] \times 2$$

$$= 10 + 0.7$$

$$\text{IRR} = 10.7\%$$

Acceptance Rule: The use of IRR, as a criterion to accept capital investment decision involves a comparison of IRR with the required rate of return known as cut off rate. The project should be accepted if IRR is greater than cut-off rate. If IRR is equal to cut off rate the firm is indifferent. If IRR less than cut off rate the project is rejected.

4.13 Capital Rationing

Capital rationing refers to the situation where budgetary or fund constraints are imposed on the firm and the firm may not be in a position to invest its available scarce resources in all the acceptable projects. According to Weston and Brigham, "capital rationing is a situation where a constraint is placed on the total size of funds invested" during a particular periods. "Under the situation of capital rationing, it is not possible on the part of the company to select all the available investment proposals due to financial constraints". Hence, the company has to rank the proposals applying the techniques of appraisal and finally select the best proposals within the available funds.

Causes for Capital Rationing

The reasons for imposing restrictions on the finances of the company and evidence of capital rationing are as follows:

- ✓ It is difficult to raise funds through external sources;
- ✓ Some firms may impose limitations on capital expenditure due to lack of managerial resources;
- ✓ A firm may resort to capital rationing due to the reason that its cost of capital may rise by way of raising additional funds and ;
- ✓ Some may not be interested in further expansion, but they may be interested to stabilize the present position.

Project Selection under Capital Rationing:

Selection of projects under capital rationing is made by:

- ✓ ranking the projects according to Internal Rate of Return or Profitability Index.
- ✓ selecting the projects in descending order of the ranks until the budgeted funds are exhausted.
- ✓ not selecting the investment project with negative Net Present Value (NPV)- or Internal Rate of Return (IRR) or below the cost of capital

Check Your Progress

Choose the Correct Answer:

1. Which of the following is a non-discounting method of capital budgeting?

- a) Net Present Value (NPV)
- b) Internal Rate of Return (IRR)
- c) Accounting Rate of Return (ARR)
- d) Profitability Index (PI)

Answer: c) Accounting Rate of Return (ARR)

2. Payback period measures:

- a) Profitability of a project
- b) Time required to recover the initial investment
- c) Present value of cash flows
- d) Rate of return of the project

Answer: b) Time required to recover the initial investment

3. In NPV method, a project is accepted if:

- a) $NPV > 0$

- b) $NPV < 0$
- c) $NPV = 0$
- d) $NPV < \text{Initial Investment}$

Answer: a) $NPV > 0$

4. IRR is defined as the discount rate at which:

- a) $NPV = \text{Initial Investment}$
- b) $NPV = 0$
- c) $ARR = 0$
- d) $\text{Profit} = 0$

Answer: b) $NPV = 0$

5. Which method takes into account the time value of money?

- a) Payback Period
- b) ARR
- c) NPV and IRR
- d) Accounting Profit Method

Answer: c) NPV and IRR

6. Capital rationing refers to:

- a) Selecting projects when funds are unlimited
- b) Selecting projects when funds are limited
- c) Rejecting profitable projects
- d) None of the above

Answer: b) Selecting projects when funds are limited

7. ARR is calculated as:

- a) $\text{Average accounting profit} \div \text{Initial investment} \times 100$
- b) $\text{Cash inflow} \div \text{Initial investment} \times 100$
- c) $\text{NPV} \div \text{Investment} \times 100$
- d) $\text{Present value of cash inflows} \div \text{Investment} \times 100$

Answer: a) Average accounting profit \div Initial investment \times 100

8. A project requires an investment of ₹1,00,000 and generates annual cash inflows of ₹25,000. What is the payback period?

- a) 2 years
- b) 3 years
- c) 4 years
- d) 5 years

Answer: c) 4 years

(Payback Period = $1,00,000 \div 25,000 = 4$ years)

9. A project has cash inflows of ₹50,000 per year for 3 years. If the required rate of return is 10%, what is the method to calculate the present value of inflows?

- a) ARR
- b) Payback Period
- c) NPV
- d) Accounting Profit

Answer: c) NPV

10. When multiple projects are competing for limited funds, which method is used to select projects?

- a) ARR
- b) Payback Period
- c) Capital Rationing / Profitability Index
- d) Simple Average Method

Answer: c) Capital Rationing / Profitability Index

Small Questions – LOCF Mapping Table

| S.No | Small Question | CO | Bloom's Level | PO |
|------|---|-----|---------------|-----|
| 1 | Define Accounting Rate of Return (ARR). | CO1 | Remembering | PO1 |
| 2 | What is meant by Payback Period? | CO1 | Understanding | PO1 |
| 3 | A project requires an investment of ₹1,00,000 and generates annual cash inflows of ₹25,000. Calculate the Payback Period. | CO2 | Applying | PO2 |
| 4 | Explain Net Present Value (NPV) and its significance. | CO1 | Understanding | PO1 |
| 5 | A project has an initial investment of ₹50,000 and expected cash inflows of ₹20,000 per year for 3 years. Calculate NPV at 10% discount rate. | CO3 | Applying | PO3 |

Big Questions – LOCF Mapping Table

| S.No | Big Question | CO | Bloom's Level | PO |
|------|---|-----|---------------|-----|
| 1 | Explain Accounting Rate of Return (ARR) and its significance in project evaluation. | CO1 | Understanding | PO1 |
| 2 | Discuss the advantages and limitations of the Payback Period method. | CO1 | Analyzing | PO1 |
| 3 | Explain Net Present Value (NPV) method and its importance in capital budgeting decisions. | CO1 | Understanding | PO1 |
| 4 | A project requires an initial investment of ₹1,50,000 and generates cash inflows of ₹50,000 per year for 4 years. Calculate NPV at 10% discount rate. | CO3 | Applying | PO3 |
| 5 | Discuss the concept of Capital Rationing and how it affects project selection. | CO2 | Evaluating | PO2 |

UNIT – V

WORKING CAPITAL

Structure:

5.1 Introduction

5.2 Definitions and Classification of Working Capital

5.3 Concept of Working Capital

5.4 Working Capital Cycle

5.5 Requirements of Working Capital

5.6 Kinds of Working Capital

5.7 Nature of Working Capital

5.8 Importance of Working Capital

5.9 Components of Working Capital

5.10 Working Capital Policies

5.11 Determinants of Working Capital

5.12 Forecasting the Working Capital Requirements

5.13 Working Capital Cycle and Cash Conversion Cycle

5.1 Introduction

Working capital, also known as short term capital, working capital is a financial metric which represents operating liquidity available to a business. Along with fixed assets such as plant and equipment, working capital is considered a part of operating capital. It is calculated as current assets minus current liabilities. If current assets are less than current liabilities, an entity has a working capital deficiency, also called a working capital deficit. Net working capital is

working capital minus cash (which is a current asset). It is a derivation of working capital that is commonly used in valuation techniques such as DCFs (Discounted cash flows).

Working Capital = Current Assets – Current Liabilities

A company can be endowed with assets and profitability but short of liquidity if its assets cannot readily be converted into cash. Positive working capital is required to ensure that a firm is able to continue its operations and that it has sufficient funds to satisfy both maturing short-term debt and upcoming operational expenses. The management of working capital involves managing inventories, accounts receivable and payable and cash.

Current assets and current liabilities include three accounts which are of special importance. These accounts represent the areas of the business where managers have the most direct impact:

- i) A (current asset)
- ii) Inventory (current assets), and
- iii) Accounts payable (current liability)

The current portion of debt (payable within 12 months) is critical, because it represents a short-term claim to current assets and is often secured by long term assets. Common types of short-term debt are bank loans and lines of credit.

An increase in working capital indicates that the business has either increased current assets (that is has increased its receivables, or other current assets) or has decreased current liabilities, for example has paid off some short-term creditors.

Implications on [M&A](#): The common commercial definition of working capital for the purpose of a working capital adjustment in an M&A transaction (ie for a working capital adjustment mechanism in a sale and purchase agreement) is equal to:

Current Assets - Current Liabilities excluding deferred tax assets/liabilities, excess cash, surplus assets and/or deposit balances.

Cash balance items often attract a one-for-one purchase price adjustment.

5.2 Definitions and Classification of Working Capital

Working capital refers to the circulating capital required to meet the day to day operations of a business firm. Working capital may be defined by various authors as follows:

According to Weston & Brigham - "Working capital refers to a firm's investment in short term assets, such as cash amounts receivables, inventories etc.

Working capital means current assets. —Mead, Baker and Malott

"The sum of the current assets is the working capital of the business" —J.S.Mill

Working capital is defined as "the excess of current assets over current liabilities and provisions". But as per accounting terminology, it is difference between the inflow and outflow of funds. In the Annual Survey of Industries (1961), working capital is defined to include "Stocks of materials, fuels, semi-finished goods including work-in-progress and finished goods and by-products; cash in hand and bank and the algebraic sum of sundry creditors as represented by (a) outstanding factory payments e.g. rent, wages, interest and dividend; b) purchase of goods and services; c) short-term loans and advances and sundry debtors comprising amounts due to the factory on account of sale of goods and services and advances towards tax payments".

The term "working capital" is often referred to "circulating capital" which is frequently used to denote those assets which are changed with relative speed from one form to another i.e., starting from cash, changing to raw materials, converting into work-in-progress and finished products, sale of finished products and ending with realization of cash from debtors. Working

capital has been described as the “life blood of any business which is apt because it constitutes a cyclically flowing stream through the business”.

5.3 Concept of Working Capital

There are two concepts of working capital. These are:

1. Gross working capital: (Total Current Assets)

The gross working capital, simply called as working capital refers to the firm’s investment in current assets. Current assets are the assets, which can be converted into cash within an accounting year or operating cycle. Thus, Gross working capital, is the total of all current assets. It includes

1. Inventories (Raw materials and Components, Work-in-Progress, Finished Goods, Others).
2. Trade Debtors.
3. Loans and Advance.
4. Cash and Bank Balances.
5. Bills Receivables.
6. Short-term Investment.

2. Net Working Capital: (Total Current Assets – Total Current Liabilities)

Net working capital refers to the difference between current assets and current liabilities. Current liabilities are those claims of outsiders, which are expected to mature for payment within an accounting year. Net working capital may be positive or negative. A positive net working capital will arise when current assets exceed current liabilities and a negative net working

capital will arise when current liabilities exceed current assets i.e. there is no working capital, but there is a working capital deficit. It includes

1. Trade Creditors
2. Bills Payable.
3. Accrued or Outstanding Expenses.
4. Trade Advances
5. Short Term Borrowings (Commercial Banks and Others)
6. Provisions
7. Bank Overdraft

“Working Capital represents the amount of current assets that have not been supplied by current, short term creditors.”

“Gross working capital refers to the amount of funds invested in current assets that are employed in the business process while, Net Working Capital refers to the difference between current assets and current liabilities.”

“Working Capital is the excess of current assets that has been supplied by the long-term creditors and the stockholders.”

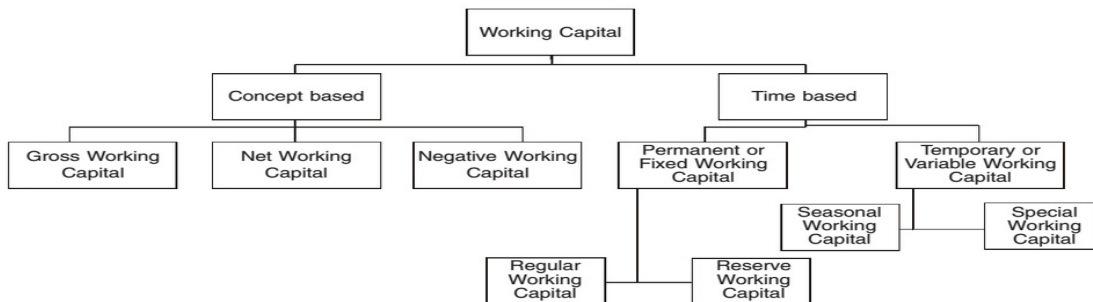
The two concepts of working capital, gross working capital and net working capital are exclusive. Both are equally important for the efficient management of working capital. The gross working capital focuses attention on two aspects How to optimize investment in current assets? and How should current assets be financed? While, net working capital concept is qualitative. It indicates the liquidity position of the firm and suggests the extent to which working capital needs may be financed by permanent sources of funds.

Working Capital May Be Classified In Two Ways

- a) Concept based working capital
- b) Time based working capital

Figure 5.1

Classification of Working Capital



Concepts of working capital

1. Gross Working Capital: It refers to the firm's investment in total current or circulating assets.

2. Net Working Capital:

The term "Net Working Capital" has been defined in two different ways:

i) It is the excess of current assets over current liabilities. This is, as a matter of fact, the most commonly accepted definition. Some people define it as only the difference between current assets and current liabilities. The former seems to be a better definition as compared to the latter.

ii) It is that portion of a firm's current assets which is financed by long-term funds.

3. Permanent Working Capital: This refers to that minimum amount of investment in all current assets which is required at all times to carry out minimum level of business activities. In other words, it represents the current assets required on a continuing

basis over the entire year. Tandon Committee has referred to this type of working capital as “Core current assets”.

The following are the characteristics of this type of working capital:

1. Amount of permanent working capital remains in the business in one form or another. This is particularly important from the point of view of financing. The suppliers of such working capital should not expect its return during the life-time of the firm.
2. It also grows with the size of the business. In other words, greater the size of the business, greater is the amount of such working capital and vice versa

Permanent working capital is permanently needed for the business and therefore it should be financed out of long-term funds.

- 4. Temporary Working Capital:** The amount of such working capital keeps on fluctuating from time to time on the basis of business activities. In other words, it represents additional current assets required at different times during the operating year. For example, extra inventory has to be maintained to support sales during peak sales period. Similarly, receivable also increase and must be financed during period of high sales. On the other hand investment in inventories, receivables, *etc.*, will decrease in periods of depression.

Suppliers of temporary working capital can expect its return during off season when it is not required by the firm. Hence, temporary working capital is generally financed from short-term sources of finance such as bank credit.

Figure 5.2

Temporary Working Capital

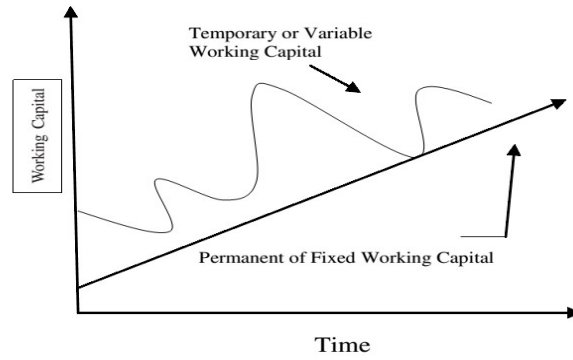
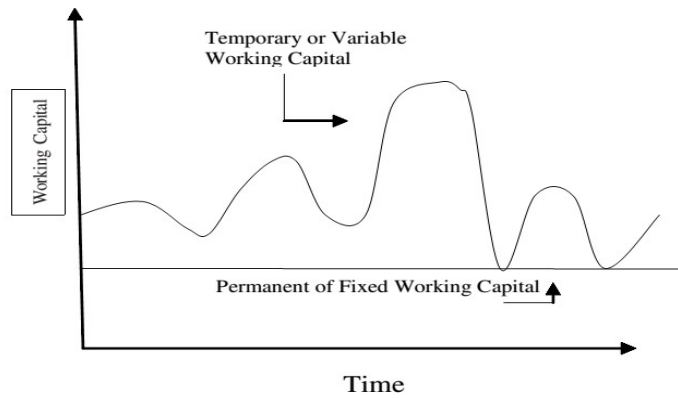


Figure 5.3

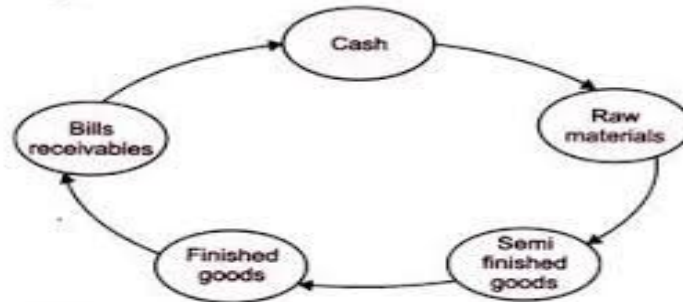
Temporary Working Capital



5. Negative Working Capital: This situation occurs when the current liabilities exceed the current assets. It is an indication of crisis to the firm.

5.4 Working Capital Cycle

Fig. 5.4
Working Capital Cycle



The determination of WC helps in forecast, control & management of WC. The duration of WC may vary depending upon the nature of business. The duration of operating cycle (WC cycle) for the purpose of estimating WC is equal to the sum of duration of each of above events less the credit period allowed by the supplier. For ex.- A co. holds raw material on an average for 60 days, it gets credit from supplier for 15 days, production process needs 15 days, finished products are held 30 days & 30 days is the total WC cycle. So, $60+15+30+30-15=120$ days.

5.5 Requirements of Working Capital

There are no set rules or formula to determine the working capital requirements of the firms. A large number of factors influence the working capital need of the firms. All factors are of different importance and also importance change for the firm over time. Therefore, an analysis of the relevant factors should be made in order to determine the total investment in working capital. Generally the following factors influence the working capital requirements of the firm:

1. Nature and size of the business

2. Seasonal fluctuations
3. Production policy
4. Taxation
5. Depreciation policy
6. Reserve policy
7. Dividend policy
8. Credit policy:
9. Growth and expansion
10. Price level changes
11. Operating efficiency
12. Profit margin and profit appropriation

5.6 Kinds of Working Capital

The working capital in certain enterprise may be [classified](#) into the following kinds.

1. Initial working capital

The capital, which is required at the time of the commencement of [business](#), is called initial working capital. These are the promotion expenses incurred at the earliest stage of formation of the enterprise which include the incorporation fees. Attorney's fees, office expenses and other preliminary expenses.

2. Regular working capital

This type of working capital remains always in the enterprise for the successful operation. It supplies the funds necessary to meet the current [working](#) expenses i.e. for purchasing raw material and supplies, payment of wages, [salaries](#) and other sundry expenses.

3. Fluctuating working capital

This capital is needed to meet the seasonal requirements of the business. It is used to raise the volume of production by improvement or extension of machinery. It may be secured from any financial institution which can, of [course](#), be met with short term capital. It is also called variable working capital.

4. Reserve margin working capital

It represents the amount utilized at the time of contingencies. These unpleasant events may occur at any time in the running life of the business such as inflation, depression, slump, flood, fire, [earthquakes](#), strike, lay off and unavoidable competition etc. In this case greater amount of capital is required for maintenance of the business.

5. Permanent and Temporary Working Capital

The Operating Cycle creates the need for Current Assets (Working Capital). However the need does not come to an end once the cycle is completed. It continues to exist. To explain the continuing need of current assets, a distinction should be drawn between temporary and permanent working capital.

Business Activity does not come to an end after the realization of cash from customers. For a company, the process is continuing, and hence, the need for regular supply of working capital. However, the, magnitude of Working Capital required is not constant but fluctuating.

To carry on a business, a certain minimum level of working capital is necessary on a continuous and uninterrupted basis. For all practical purposes, this requirement has to be met permanently as with other fixed assets. This requirement is referred to as permanent or fixed working capital.

Any amount over and above the permanent level of working capital is temporary, fluctuating or variable working capital. The position of the required working capital is needed to meet fluctuations in demand consequent upon changes in production and sales as a result of seasonal changes. Both kinds of working capital are necessary to facilitate the sales proceeds through the Operating Cycle.

6. Long Term working capital

The long-term working capital represents the amount of funds needed to keep a company running in order to satisfy demand at lowest point. There may be many situations where Demand may fluctuate considerably. It is not possible to retrench the work force or instantly sell all the inventories whenever demand declines Due to temporary reasons. Therefore the value, which represents the long-term working capital, stays with the business process all the time. It is for all practical purpose as permanent as fixed assets. In other words, it consists of the minimum current assets to be maintained at all times. The size of the permanent working capital varies directly with the size of Operation of a firm.

7. Short term working capital

Short-term capital varies directly with the level of activity achieved by a company. The Volume of Operation decides the quantum of Short-term working capital. It also changes from one firm to another; from cash to inventory from inventory to debtors and from debtors back to cash. It may not always be gain fully employed. Temporary Working capital should be obtained from such sources, which will allow its return when it is not in use.

8. Gross Working Capital

Gross working capital refers to the firm's investment in current assets. Current assets are those assets which can be converted in to cash with in an accounting year and includes cash short term securities, debtors bills receivable and stock.

9. Net Working Capital

Net working capital refers to the difference between current asset and Current liabilities. Current liabilities are those claims of outsiders, which are expected to mature for payment within accounting year and include creditors, bills payable and outstanding expenses. Net Working capital can be positive or negative. A positive net working capital will arise when current assets exceed current liabilities.

The Gross working capital concept focuses attention on two aspect of current assets management.

1. How to optimize investment in current assets?
2. How should current assets be finance?

Both the question is the most decision making action of the management. It should be give due consideration before taking decision. Both Net and Gross working capital is important and they have equal significance from management point of view.

The consideration of the level of investment in current assets should avoid two danger points – Excessive and Inadequate investment in current assets. Investment in Current assets should be just adequate, not more or less, to the need of the business firm. Excessive investment in current assets should be avoided because it impairs the firm's profitability as idle investment earns nothing on the other hand, inadequate amount of working capital can threaten solvency of the business because its inability to meet its current obligation. It should realize that the working

capital needs of the firm may be fluctuation with changing business activity. This may cause excess or shortage of working capital frequently. The management should be prompt to initiate an action and correct imbalances.

Another aspect of the Gross working capital points to the need of arranging funds to finance current assets. Whenever a need for working capital fund arises due to the increasing level of business activity or for any other reason financing arrangement should not be allowed to remain idle, but should be invested in short term securities. Thus the finance manager should have knowledge of the sources of fund as well as investment of idle fund.

Net Working capital is qualitative concept. It indicates the liquidity position of the firm and suggests the extent to which working capital needs may be finance by permanent source of fund. A weak solvency of the company and makes it unsafe and unsound.

Net working capital concept also covers the question of judicious mix of long term and short term funds for financing current assets. For every firm, there is a minimum amount of net Working capital which is permanent. Therefore, a portion of working capital should be finance with the permanent sources of fund such as share capital, debenture, and long-term debt, preference share capital or retail earning. Management must decide the extent to which current assets should be financed with Equity capital and/or borrowed capital. So we can say that both Gross and net working capital are equally important for the efficient management of working capital.

The objective of working capital management is to maintain the optimum balance of each of the working capital components. This includes making sure that funds are held as cash in bank deposits for as long as and in the largest amounts possible, thereby maximizing the interest

earned. However, such cash may more appropriately be "invested" in other assets or in reducing other liabilities.

5.7 Nature of Working Capital

Working Capital Management is concerned with the problems that arise in attempting to manage the Current Assets, the Current Liabilities and the inter-relationship that exists between them. The term Current Assets refers to those Assets which in the ordinary course of business can be, or will be, converted into Cash within one year without undergoing a diminution in value and without disrupting the operations of the firm. The Major Current Assets are Cash, Marketable Securities, Accounts Receivables and Inventory.

Current Liabilities are those Liabilities, which are intended at their inception, to be paid in the ordinary course of business, within a year out of the current assets or the earnings of the concern. The basic Current Liabilities are Accounts Payable, Bills Payable, Bank Overdraft and outstanding expense. The goal of Working Capital Management is to manage the firm's Assets and Liabilities in such a way that a satisfactory level of working capital is maintained. This is so because if the firm cannot maintain a satisfactory level of working capital, it is likely to become insolvent and may even be forced into bankruptcy.

The Current Assets should be large enough to cover its current liabilities in order to ensure a reasonable margin of safety. Each of the current assets must be managed efficiently in order to maintain the liquidity of the firm while not keeping too high a level of any one of them. Each of the short term sources of financing must be continuously managed to ensure that they are obtained and used in the best possible way. The interaction between current assets and current liabilities is, therefore, the main theme of the theory of management of working capital.

Many organisations that are profitable on paper are forced to cease trading due to an inability to meet short-term debts when they fall due. In order to remain in business it is essential that an organisation successfully manages its working capital. Too often however, this is an area which is ignored. This article will look at the items which comprise working capital, and using live examples will consider the level of working capital required by businesses operating in different industries.

The definition of working capital is fairly simple; it is the difference between an organisation's current assets and its current liabilities. Of more importance is its function which is primarily to support the day-to-day financial operations of an organisation, including the purchase of stock, the payment of salaries, wages and other business expenses, and the financing of credit sales.

As the cycle indicates, working capital comprises a number of different items and its management is difficult since these are often linked. Hence altering one item may impact adversely upon other areas of the business. For example, a reduction in the level of stock will see a fall in storage costs and reduce the danger of goods becoming obsolete. It will also reduce the level of resources that an organisation has tied up in stock. However, such an action may damage an organization's relationship with its customers as they are forced to wait for new stock to be delivered, or worse still may result in lost sales as customers go elsewhere.

Extending the credit period might attract new customers and lead to an increase in turnover. However, in order to finance this new credit facility an organisation might require a bank overdraft. This might result in the profit arising from additional sales actually being less than the cost of the overdraft.

Management must ensure that a business has sufficient working capital. Too little working capital will result in cash flow problems. Problems can be highlighted by an organisation exceeding its agreed overdraft limit, failing to pay suppliers on time, and being unable to claim discounts for prompt payment. In the long run, a business with insufficient working capital will be unable to meet its current obligations and will be forced to cease trading even if it remains profitable on paper.

On the other hand, if an organisation ties up too much of its resources in working capital it will earn a lower than expected rate of return on capital employed. Again this is not a desirable situation.

5.8 Importance of Working Capital

Working capital is one of the important measurements of the financial position. The words of H. G. Guthmann clearly explain the importance of working capital. “Working Capital is the life-blood and nerve centre of the business.” In the words of Walker, “A firm’s profitability is determined in part by the way its working capital is managed.” The object of working capital management is to manage firm’s current assets and liabilities in such a way that a satisfactory level of working capital is maintained. If the firm cannot maintain a satisfactory level of working capital, it is likely to become insolvent and may even be forced into bankruptcy. Thus, need for working capital to run day-to-day business activities smoothly can’t be overemphasized.

1. It helps measure profitability of an enterprise. In its absence, there would be neither production nor profit.
2. Without adequate working capital an entity cannot meet its short-term liabilities in time.
3. A firm having a healthy working capital position can get loans easily from the market due to its high reputation or goodwill.

4. Sufficient working capital helps maintain an uninterrupted flow of production by supplying raw materials and payment of wages.
5. Sound working capital helps maintain optimum level of investment in current assets.
6. It enhances liquidity, solvency, credit worthiness and reputation of enterprise.
7. It provides necessary funds to meet unforeseen contingencies and thus helps the enterprise run successfully during periods of crisis.

5.9 Components of Working Capital

Working capital is composed of various current assets and current liabilities, which are as follows:

1. Current Assets:

These assets are generally realized within a short period of time, i.e. within one year.

Current assets include:

- (a) Inventories or Stocks
 - (i) Raw materials
 - (ii) Work in progress
 - (iii) Consumable Stores
 - (iv) Finished goods
- (b) Sundry Debtors
- (c) Bills Receivable
- (d) Pre-payments
- (e) Short-term Investments
- (f) Accrued Income and
- (g) Cash and Bank Balances

2. Current Liabilities:

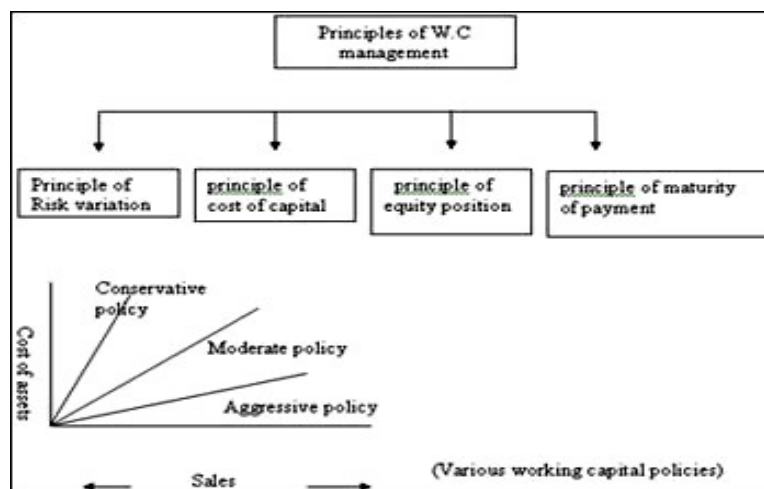
Current liabilities are those which are generally paid in the ordinary course of business within a short period of time, i.e. one year. Current liabilities include:

- (a) Sundry Creditors
- (b) Bills Payable
- (c) Accrued Expenses
- (d) Bank Overdrafts
- (e) Bank Loans (short-term)
- (f) Proposed Dividends
- (g) Short-term Loans
- (h) Tax Payments Due

5.10 Working Capital Policies

Figure 5.5

Working Capital Policies



1. Principles of Risk variation

- i) Here risk refers to the inability of a firm to meet its obligation, when they become due for payment.
- ii) There is a definite inverse relationship between the degree of risk & profitability.
- iii) A management prefers to minimize risk by maintaining a higher level of current assets or working capital.

2. Principles of cost of capital

- i) Generally, higher the risk lower is the cost & lowers the risk, higher is the cost.
- ii) A sound working capital management should always try to achieve a proper balance b/w these two.

3. Principles of equity position

- i) It is concerned with planning the total investment in Current Asset.
- ii) Every rupee invested in the current assets should contribute to the net worth of the firm.

The level of Current Asset may be measured with the help of two ratios

- i) Current assets as a % of total assets.
- ii) Current assets as a % of total sales.

4. Principle of maturity of payment

- i) It is concerned with planning the sources of finance for working capital.
- ii) A firm should make every effort to relate maturities of payment to its flow of internally generated funds.
- iii) Working capital financing policy basically deals with the sources and the amount of working capital that a company should maintain.

- iv) A firm is not only concerned about the amount of current assets but also about the proportions of short-term and long-term sources for financing the current assets. There are several working capital investment policies a firm may adopt after taking into account the variability of its cash inflows and outflows and the level of risk.

Hedging Policy

- i) One of the policies by which a firm finances its working capital needs is the hedging policy, also known as matching policy. This policy works in an arrangement where the current assets of the business are used perfectly to match the current liabilities.
- ii) As per this approach, fixed and permanent current assets are financed through long-term sources and fluctuating current assets are financed through short-term sources.
- iii) This policy is a medium risk proposition and requires a good amount of attention. For example, if a bank loan is due to be paid after six months, the company will ensure that sufficient amount of cash will be available to repay the loan on the date of maturity even though it may or may not currently have sufficient cash.
- iv) In case of a growth firm, the amount of fixed assets and permanent current asset go on increasing with the passage of time but the volume of fluctuating current assets change with the change in production level. In Figure 8.1, Line A and Line B is upward sloped indicating that they go on increasing with the passage of time and as per hedging principle they are financed through long-term sources like equity and long-term debt.

- v) Fluctuating current assets, which are shown by the curved Line C, should be financed through short term sources.

Figure 5.6

Hedging/Matching Policy

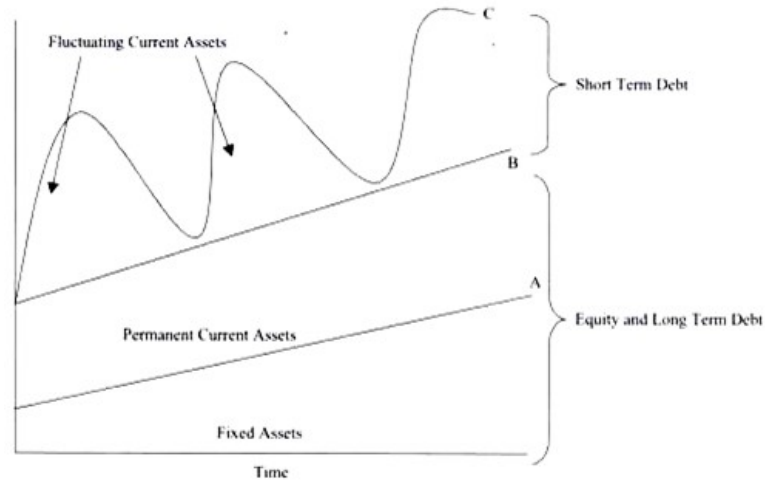


FIGURE 8.1 Hedging/Matching Policy

Conservative Policy:

- i) As the name suggests, this policy tries to avoid the risk involved in financing of current assets. Here, relatively high proportions of long-term sources are to be used for financing current assets. The firm not only matches the current assets with current liabilities but also keeps some excess amount to meet any uncertainty.
- ii) This is the lowest risk working capital policy and fails to ensure optimum utilization of funds. Hence it cuts down the expected returns of the shareholders. This policy is illustrated in Figure 8.2. Line A denotes the fixed assets and Line B denotes the permanent working capital, which is financed through long-term

sources. Certain portion of fluctuating current assets, which is shown by dashed Line C, is also financed by long-term sources. Under this policy some part of fluctuating current assets is financed through short-term sources.

Figure 5.7

Conservative Policy

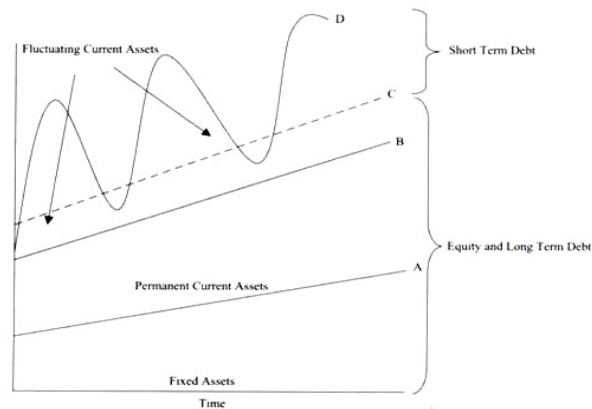


FIGURE 8.2 Conservative Policy

Aggressive Policy

- i) Aggressive working capital financing policy is a risky policy that requires maximum amount of investment in current assets. Fluctuating as well as permanent current assets under this policy will be financed through short-term debt. In this policy debt is collected on time and payments to the creditors are made as late as possible.
- ii) This policy has been illustrated in Figure 8.3. According to this approach long-term sources are used to finance the fixed assets, which are shown by Line A; but a portion of permanent current assets, shown by the dotted Line B, is also financed through long-term sources. The remaining part of permanent current

assets, depicted by Line C, and the entire amount of fluctuating current assets, shown by the curved Line D, are financed by short-term debt.

Figure 5.8
Aggressive Policy

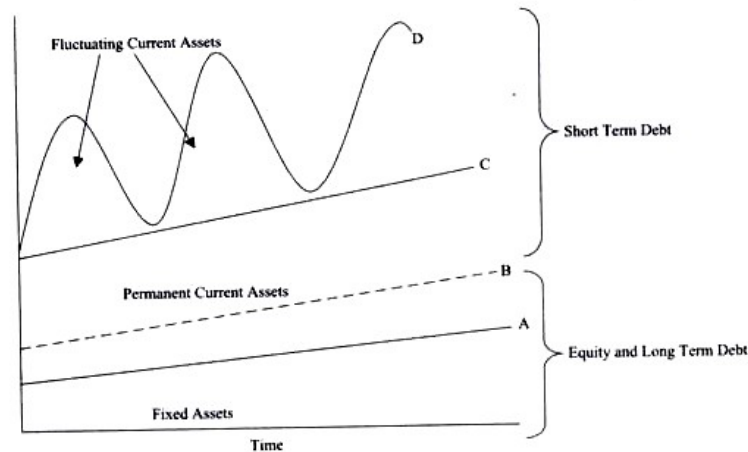


FIGURE 8.3 Aggressive Policy

5.11 Determinants of Working Capital

The factors influencing the working capital decisions of a firm may be classified as two groups, such as internal factors and external factors. The internal factors includes, nature of business size of business, firm's product policy, credit policy, dividend policy, and access to money and capital markets, growth and expansion of business etc. The external factors include business fluctuations, changes in the technology, infrastructural facilities, import policy and the taxation policy etc. These factors are discussed in brief in the following lines.

I. Internal Factors

1. Nature and size of the business

The working capital requirements of a firm are basically influenced by the nature and size of the business. Size may be measured in terms of the scale of operations. A firm with larger scale of operations will need more working capital than a small firm. Similarly, the nature of the business - influence the working capital decisions. Trading and financial firms have less investment in fixed assets. But require a large sum of money to be invested in working capital. Retail stores, business units require larger amount of working capital, where as, public utilities need less working capital and more funds to invest in fixed assets.

2. Firm's production policy

The firm's production policy (manufacturing cycle) is an important factor to decide the working capital requirement of a firm. The production cycle starts with the purchase and use of raw material and completes with the production of finished goods. On the other hand production policy is uniform production policy or seasonal production policy etc., also influences the working capital decisions. Larger the manufacturing cycle and uniform production policy – larger will be the requirement of working capital. The working capital requirement will be higher with varying production schedules in accordance with the changing demand.

3. Firm's credit policy

The credit policy of a firm influences credit policy of working capital. A firm following liberal credit policy to all customers require funds. On the other hand, the firm adopting strict credit policy and grant credit facilities to few potential customers will require less amount of working capital.

4. Availability of credit

The working capital requirements of a firm are also affected by credit terms granted by its suppliers – i.e. creditors. A firm will need less working capital if liberal credit terms are available to it. Similarly, the availability of credit from banks also influences the working capital needs of the firm. A firm, which can get bank credit easily on favorable conditions will be operated with less working capital than a firm without such a facility.

5. Growth and expansion of business

Working capital requirement of a business firm tend to increase in correspondence with growth in sales volume and fixed assets. A growing firm may need funds to invest in fixed assets in order to sustain its growing production and sales. This will, in turn, increase investment in current assets to support increased scale of operations. Thus, a growing firm needs additional funds continuously.

6. Profit margin and dividend policy

The magnitude of working capital in a firm is dependent upon its profit margin and dividend policy. A high net profit margin contributes towards the working capital pool. To the extent the net profit has been earned in cash, it becomes a source of working capital. This depends upon the dividend policy of the firm. Distribution of high proportion of profits in the form of cash dividends results in a drain on cash resources and thus reduces company's working capital to that extent. The working capital position of the firm is strengthened if the management follows conservative dividend policy and vice versa.

7. Operating efficiency of the firm

Operating efficiency means the optimum utilisation of a firm's resources at minimum cost. If a firm successfully controls operating cost, it will be able to improve net profit margin which, will, in turn, release greater funds for working capital purposes.

8. Co-ordinating activities in firm

The working capital requirements of a firm is depend upon the co-ordination between production and distribution activities. The greater and effective the co-ordinations, the pressure on the working capital will be minimized. In the absence of co-ordination, demand for working capital is reduced.

II. External Factors

1. Business fluctuations

Most firms experience fluctuations in demand for their products and services. These business variations affect the working capital requirements. When there is an upward swing in the economy, sales will increase, correspondingly, the firm's investment in inventories and book debts will also increase. Under boom, additional investment in fixed assets may be made by some firms to increase their productive capacity. This act of the firm will require additional funds. On the other hand when, there is a decline in economy, sales will come down and consequently the conditions, the firm try to reduce their short-term borrowings. Similarly the seasonal fluctuations may also affect the requirement of working capital of a firm.

2. Changes in the technology

The technological changes and developments in the area of production can have immediate effects on the need for working capital. If the firm wish to install a new machine in

the place of old system, the new system can utilise less expensive raw materials, the inventory needs may be reduced there by working capital needs.

3. Import policy

Import policy of the Government may also effect the levels of working capital of a firm since they have to arrange funds for importing goods at specified times.

4. Infrastructural facilities

The firms may require additional funds to maintain the levels of inventory and other current assets, when there is good infrastructural facilities in the company like, transportation and communications.

5. Taxation policy

The tax policies of the Government will influence the working capital decisions. If the Government follow regressive taxation policy, i.e. imposing heavy tax burdens on business firms, they are left with very little profits for distribution and retention purpose. Consequently the firm has to borrow additional funds to meet their increased working capital needs. When there is a liberalised tax policy, the pressure on working capital requirement is minimised. Thus the working capital requirements of a firm is influenced by the internal and external factors.

5.12 Forecasting the Working Capital Requirements

"Working capital is the life blood & controlling nerve centre of a business." No business can be successfully run without an adequate amount of working capital.

- i) To avoid the shortage of working capital at once, an estimate of working capital requirement should be made in advance.

- ii) But estimation of working capital requirements is not an easy task & a large no. of factors has to be considered before starting this.

Factors requiring consideration while estimating working capital

- i) The average credit period expected to be allowed by suppliers.
- ii) Total costs incurred on material, wages.
- iii) The length of time for which raw material are to remain in stores before they are issued for production.
- iv) The length of the production cycle (or) work in process.
- v) The length of sales cycle during which finished goods are to be kept waiting for sales.
- vi) The average period of credit allowed to customers
- vii) The amount of cash required to make advance payment

Estimating working capital needs is critical when starting up a new business, and when going through a period of growth and expansion. By understanding the cycles a business goes through, and assigning some numbers to them, it is possible to come up with a realistic estimate of how much working capital you should have on hand. And, when a business is experiencing financial difficulties, an analysis of these cycles and the impact they have on cash flow and resources enables taking the necessary steps to turn the situation around.

5.13 Working Capital Cycle and Cash Conversion Cycle

A production environment, whether large or small, may serve as a good example for defining the different stages a business operation goes through, from the time commitments are made for raw materials, supplies, and services, until payment is received from the customer for the final product sold.

Working capital includes inventory, payables, and receivables, so the working capital cycle covers the period from when commitments are first made until payment is received from the customer. The working capital cycle may differ from the cash conversion cycle, since goods and services may be purchased on credit; certain expenses such as salaries, wages, and utilities accrue during the period; and sales to the customer may be on credit terms. So, the cash conversion cycle is the time from payment of accruals to collection of receivables. It is the amount of time cash is tied up in the cycle, and not available for other purposes.

Throughout the process, incremental costs will continue to be added and will need to be financed with working capital until payment is received and the cycle is complete. For example, at the start of the production period the costs are in raw materials. As production begins, costs for labor, supplies, and overhead are added. When finished goods are placed in inventory, storage costs may be incurred. And the sale of the products to customers may involve shipping costs, commissions, or other selling expenses. Working capital requirements increase as the business cycle progresses.

1. Ongoing Cycles

Another point to take into consideration is that cycles are ongoing. Purchases and collections may be made every day during the period, so the cycle for one particular product overlaps with the cycle for another product.

The cycle is constantly repeating itself, and at any given point in time, each individual cycle will be at a different stage of completion. The idea is to come up with a way to determine average balances for inventory, payables and receivables in order to determine an overall estimate of working capital needs.

2. Operating Cycle

In practical life, Sales never convert into Cash instantly; there is invariably a lag between the sale of goods and the receipt of cash. There is, therefore, a need of working capital in the form of current assets to deal with the problem arising out of the lack of immediate realization of cash against goods sold. Therefore, sufficient working capital is necessary to sustain sales activity. Technically, this is referred to as Operating or Cash Cycle.

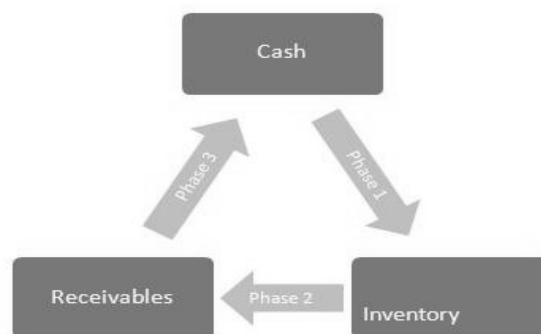
The Operating cycle can be said to be at the heart of the need of working capital. The continuing flow from cash to suppliers, to inventory, to accounts receivable and back to cash is what is called the operating cycle. In other words, the term cash cycle refers to the length of time necessary to complete the following cycle of events:-

- i) Conversion of Cash into Inventory
- ii) Conversion of Inventory into Receivables
- iii) Conversion of Receivables into Cash

The operating cycle which is a continuous process has been shown in the following figure.

Figure 5.9

Operating Cycle



The Operating Cycle Consists of 3 Phases

1. Phase 1

In Phase 1, Cash gets converted into Inventory. This includes purchase of Raw Material, Conversion of Raw Material into Work-in-Progress, Finished Goods and finally the transfer of goods to stock at the end of the manufacturing process. In the case of Trading Companies, this phase is shorter as there would be no manufacturing activity and cash is directly converted into Inventory. This Phase is of course totally absent in the case of Service Organizations.

2. Phase 2

In Phase 2 of the cycle, the Inventory is converted into Receivables as Credit Sales are made to customers. Firms which do not sell on Credit obviously don't have the Phase 2 of the operating Cycle.

3. Phase 3

The Last Phase i.e. Phase 3 of the Operating Cycle, represents the stage when Receivables are collected. This phase completes the operating cycle. Thus, the firm has moved from cash to inventory, to receivables and to cash again.

3. Breaking down the Cycle

The entire process starts with the receipt of raw materials. If they are purchased on credit, there is a commitment, in terms of accounts payable, but a cash disbursement has not yet been made. So in effect, the time from when a purchase commitment is made until the time the supplier is paid is really financing that the business is gaining, and serves to reduce the need for other sources of financing.

If production is not started immediately, there will be a period of time when raw materials are in inventory. Once production starts, the raw materials will enter the next phase -

the work-in-process inventory, where additional costs such as labor and utilities will be added. The work-in process period ends when the products are completed and the production cycle ends with the finished goods inventory.

It may turn out that products are not sold immediately upon completion, so there is a period when finished products remain in inventory pending their sale. And when sales are made, there may be a delivery period involved, and the sales may be on credit terms, so the process enters the final period in which accounts receivable are pending payment. Once collection is made and payment is received from the customer, the cycle is complete.

So, the overall business cycle can be broken down as follows:

- i) Number of days raw materials are in inventory
- ii) Minus number of days of accounts payable to suppliers
- iii) Plus number of days in work-in-process
- iv) Plus number of days products are in finished goods inventory
- v) Plus collection period from customers
- vi) Equals cash conversion period.

Once these periods are defined, calculations can be made to begin to develop an estimate of working capital needs.

Estimation of Working Capital Requirements

| I. Current Assets: | Amount | Amount | Amount |
|----------------------------------|---------------|---------------|---------------|
| Minimum Cash Balance | | **** | |
| Inventories: | | | |
| Raw Materials | **** | | |
| Work-in-Progress | **** | | |
| Finished Goods | **** | **** | |
| Receivables | | | |
| Debtors | **** | | |
| Bills | **** | **** | |
| Gross Working Capital (CA) | | **** | **** |
| II. Current Liabilities : | Amount | Amount | |
| Creditors for purchases | **** | | |
| Creditors for Wages | **** | | |
| Creditors for Overheads | **** | | |
| Total Current Liabilities (CL) | **** | **** | |
| Excess of CA over CL | | **** | |
| + Safety Margin | | **** | |
| Net Working Capital | | **** | |

Illustration: 1

From the following data, compute the duration of operating cycle for each of the two years and comment on the increase/decrease:

| Particulars | Year 1 | Year 2 |
|--------------------|---------------|---------------|
| Stock: | Rs. | Rs. |
| Raw materials | 20,000 | 27,000 |
| Work-in-progress | 14,000 | 18,000 |
| Finished goods | 21,000 | 24,000 |
| Purchases | 96,000 | 1,35,000 |
| Cost of goods sold | 1,40,000 | 1,80,000 |
| Sales | 1,60,000 | 2,00,000 |
| Debtors | 32,000 | 50,000 |
| Creditors | 16,000 | 18,000 |

Assume 350 Days per year for computational purposes.

Solution**Calculation of Operating Cycle**

| | Year 1 | Year 2 |
|-----------------------|---|-------------------------------|
| 1. Raw Material Stock | $20/96 \times 360 = 75$ Days | $27/135 \times 360 = 72$ Days |
| | (Average Raw Material/Total Purchase x 360) | |
| 2. Creditors period | $16/96 \times 360 = 60$ days | $18/135 \times 360 = 48$ days |
| | (Average Creditor/Total Purchase) x 360 | |
| 3. Work-in-progress | $14/140 \times 360 = 36$ days | $18/180 \times 360 = 36$ days |
| | (Average Work-in-progress/Total cost of goods sold) x 360 | |
| 4. Finished goods | $21/140 \times 360 = 54$ days | $24/180 \times 360 = 48$ days |
| | (Average Finished goods/Total cost of goods sold) x 360 | |
| 5. Debtors | $32/160 \times 360 = 72$ days | $50/200 \times 360 = 90$ days |
| | (Average Debtors/Total Sales) x 360 | |
| Net operating cycle | 177 days | 198 days |

This is an increase in length of operating cycle by 21 days i.e., 12% increase approximately.
Reasons for increase are as follows:

| | |
|---|----------------|
| Debtors taking longer time to pay (90-72) | 18 days |
| Creditors receiving payment earlier (60-48) | <u>12 days</u> |
| | 30 days |
| Finished goods turnover lowered (54-48) | 6 days |
| Raw material stock turnover lowered (75-72) | <u>3 days</u> |
| Increase in Operating Cycle | <u>21 days</u> |

Illustration: 2

A proforma cost sheet of a company provides the following particulars:

| Elements of Cost | Amount per unit Rs. |
|------------------|---------------------|
| Raw Material | 80 |
| Direct Labour | 30 |
| Overheads | 60 |
| Total Cost | 170 |
| Profit | 30 |
| Selling Price | 200 |

The following further particulars are available:

Raw materials are in stock on an average for one month. Materials are in process on an average for half a month. Finished goods are in stock on an average for one month. Credit allowed by suppliers is one month. Credit allowed to customers is two months. Lag in payment of wages is 1½ weeks. Lag in payment of overhead expenses is one month. One-fourth of the output is sold against cash. Cash in hand and at bank is expected to be Rs.25,000.

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, wages and overheads accrue similarly and a time period of 4 weeks is equivalent to a month.

Solution

| Statement Showing the Working Capital Needed | | |
|---|------------|------------------|
| Current Assets | Rs. | Rs. |
| Minimum cash balance | | 25,000 |
| (i) Stock of raw materials (4 weeks) | | |
| 1,60,000 x 4 | | 6,40,000 |
| (ii) Work-in-Process (2 weeks): | | |
| Raw materials 1,60,000 x 2 | 3,20,000 | |
| Direct Labour 60,000 x 2 | 1,20,000 | |
| Overheads 1,20,000 x 2 | 2,40,000 | 6,80,000 |
| (iii) Stock of Finished goods (4 weeks): | | |
| Raw Materials 1,60,000 x 4 | 6,40,000 | |
| Direct Labour 60,000 x 4 | 2,40,000 | |
| Overheads 1,20,000 x 4 | 4,80,000 | 13,60,000 |
| (iv) Sundry Debtors (8 weeks): | | |
| Raw materials 1,60,000 x 3/4 x 8 | 9,60,000 | |
| Direct Labour 60,000 x 3/4 x 8 | 3,60,000 | |
| Overheads 1,20,000 x 3/4 x 8 | 7,20,000 | 20,40,000 |
| | | 47,45,000 |
| Less Current Liabilities: | | |
| (i) Sundry Creditors (4 weeks) | | |
| 1,60,000 x 4 | 6,40,000 | |
| (ii) Wages outstanding (1-1/2 weeks): 60,000 x | 90,000 | |
| (iii) Lag in payment of overheads (4 weeks) | | |
| 1,20,000 x 4 | 4,80,000 | 12,10,000 |
| Net Working Capital Needed | | 35,35,000 |

Working Notes:

- i) It has been assumed that a time period of 4 weeks is equivalent to one month.
- ii) It has been assumed that direct labour and overheads are in process, on average, half a month.
- iii) Profit has been ignored and debtors have been taken at cost.
- iv) Weekly calculations have been made as follows:

(a) Weekly average of raw materials = $1,04,000 \times 80/52 = 1,60,000$

(b) Weekly labour cost = $1,04,000 \times 30/52 = 60,000$

(c) Weekly Overheads = $1,04,000 \times 60/52 = 1,20,000$

Illustration: 3

From the following information you are required to estimate the net working capital:

| | Cost per unit Rs. |
|------------------------------------|------------------------|
| Raw Materials | 400 |
| Direct labour | 150 |
| Overheads (excluding depreciation) | 300 |
| Total Cost | <u>850</u> |
| Additional Information: | <u>30</u> |
| Selling-Price | Rs.1,000 per unit |
| Output | 52,000 units per annum |
| Raw Material in stock | average 4 weeks |
| Work-in-process: | |
| (assume 50% completion stage with | |
| full material consumption) | average 2 weeks |
| Finished goods in stock | average 4 weeks |
| Credit allowed by suppliers | average 4 weeks |
| Credit allowed to debtors | average 8 weeks |
| Cash at bank is expected to be | Rs.50,000 |

Assume that production is sustained at an even pace during the 52 weeks of the year. All sales are on credit basis. State any other assumption that you might have made while computing.

Solution

| Statement Showing Net Working Capital Requirements | | |
|---|------------|--------------------|
| Current Assets : | Rs. | Rs. |
| Minimum cash balance | | 50,000 |
| Stock of Raw Materials (4 weeks) | | |
| $52,000 \times 400 \times (4/52)$ | | 16,00,000 |
| Stock of work-in-progress (2 weeks) | | |
| Raw material $52,000 \times 400 \times (2/52)$ | 8,00,000 | |
| Direct labour (50% completion) | | |
| | 1,50,000 | |
| Overheads (50% completion) | | |
| | 3,00,000 | 12,50,000 |
| Stock of Finished goods (4 weeks) | | |
| $52,000 \times 850 \times (4/52)$ | | 34,00,000 |
| Amount blocked in Debtors at cost (8 weeks) | | |
| $52,000 \times 850 \times (8/52)$ | | 68,00,000 |
| Total Current Assets | | 1,31,00,000 |
| Less: Current Liabilities: | | |
| Creditors for raw materials (4 weeks) | | |
| $52,00,000 \times 400 \times (4/52)$ | | 16,00,000 |
| Net Working Capital Required | | 1,15,00,000 |

Illustration: 4

Texas Manufacturing Company Ltd. is to start production on 1st January, 1995. The prime cost of a unit is expected to be Rs.40 out of which Rs.16 is for materials and Rs.24 for labour. In addition, variable expenses per unit are expected to be Rs.8 and fixed expenses per month Rs.30,000. Payment for materials is to be made in the month following the purchases. One-third of sales will be for cash and the rest on credit for settlement in the following month. Expenses are payable in the month in which they are incurred. The selling price is fixed at Rs.80 per unit. The number of units manufactured and sold are expected to be as under:

| | |
|----------|-------|
| January | 900 |
| February | 1,200 |

| | |
|-------|-------|
| March | 1,800 |
| April | 2,100 |
| May | 2,100 |
| June | 2,400 |

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

Solution

Statement Showing Requirement of Working Capital

| | January Rs. | February Rs. | March Rs. | April Rs. | May Rs. | June Rs. |
|---|----------------|-----------------|--------------|--------------|------------|-------------|
| Payments: | | | | | | |
| Materials | - | 14,400 | 19,200 | 28,800 | 33,600 | 33,600 |
| Wages | 21,600 | 28,800 | 43,200 | 50,400 | 50,400 | 57,600 |
| Fixed Expenses | 30,000 | 30,000 | 30,000 | 30,000 | 30,000 | 30,000 |
| Variable Expenses | 7,200 | 9,600 | 14,400 | 16,800 | 16,800 | 19,200 |
| | 58,800 | 82,800 | 1,06,800 | 1,26,000 | 1,30,800 | 1,40,400 |
| Receipts: | | | | | | |
| Cash Sales | 24,000 | 32,000 | 48,000 | 56,000 | 56,000 | 64,000 |
| Debtors | - | 48,000 | 64,000 | 96,000 | 1,12,000 | 1,12,000 |
| | 24,000 | 80,000 | 1,12,000 | 1,52,000 | 1,68,000 | 1,76,000 |
| Working Capital Required (Payments- Receipts) | 34,800 | 2,800 | - | - | - | - |
| Surplus | - | - | 5,200 | 26,000 | 37,200 | 35,600 |
| Cumulative Requirements of Working Capital | 34,800 | 37,600 | 32,400 | 6,400 | - | - |
| Surplus Working Capital | - | - | - | - | 30,800 | 66,400 |

Working Notes:

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

ii) Cash sales are calculated as:

For January $900 \times 80 \times 1/3 = \text{Rs.}24,000$ and in the same manner for other months.

iii) Receipts from debtors are calculated as: For Jan. – Nil because cash from debtors is collected in the month following the sales.

For Feb. – $900 \times 80 \times 2/3 = \text{Rs.}48,000$

For March – $12002 \times 80 \times 2/3 = \text{Rs.}64,000$, and so on.

Check Your Progress

Choose the Correct Answer:

1. Which of the following is considered a *current asset* in working capital?

- a) Land
- b) Machinery
- c) Accounts Receivable
- d) Patents

Answer: c) Accounts Receivable

2. The *components of working capital* include:

- a) Fixed assets and equity
- b) Current assets and current liabilities
- c) Long-term loans and investments
- d) Share capital and retained earnings

Answer: b) Current assets and current liabilities

3. The operating cycle refers to:

- a) The time taken to convert net profit into cash
- b) The time taken to convert raw materials into cash from sales
- c) The time taken to repay long-term debt
- d) The time taken for purchasing fixed assets

Answer: b) The time taken to convert raw materials into cash from sales

4. Which of the following increases working capital requirements?

- a) Reduction in inventory levels
- b) Faster collection of receivables
- c) Increase in production and sales
- d) Lengthening credit period from suppliers

Answer: c) Increase in production and sales

5. Factors influencing working capital requirements include:

- a) Business cycle, production cycle, credit policy
- b) Only fixed assets
- c) Equity capital
- d) Government grants only

Answer: a) Business cycle, production cycle, credit policy

6. The difference between current assets and current liabilities is called:

- a) Gross working capital
- b) Net working capital
- c) Fixed capital
- d) Operating capital

Answer: b) Net working capital

7. Which method is used to forecast working capital requirements based on sales?

- a) Percent of sales method
- b) Payback method
- c) Cost of capital method
- d) IRR method

Answer: a) Percent of sales method

8. If a company has high liquidity, it means:

- a) It has excessive long-term debt
- b) It can easily meet short-term obligations
- c) It has no current assets
- d) It has low sales

Answer: b) It can easily meet short-term obligations

9. Which of the following is a source of working capital?

- a) Issuing shares
- b) Purchasing machinery
- c) Paying dividends
- d) Buying land

Answer: a) Issuing shares

10. The cash conversion cycle is:

- a) The time taken to convert cash into fixed assets
- b) The time taken to convert current liabilities into cash
- c) The time between payment for raw materials and receipt from customers
- d) The total time of operating cycle plus depreciation

Answer: c) The time between payment for raw materials and receipt from customers

Small Questions – LOCF Mapping Table

| S.No | Small Question | CO | Bloom's Level | PO |
|------|--|-----|---------------|-----|
| 1 | Define working capital. | CO1 | Remembering | PO1 |
| 2 | Explain the components of working capital. | CO1 | Understanding | PO1 |
| 3 | A company has current assets of ₹2,50,000 and current liabilities of ₹1,50,000. Calculate net working capital. | CO2 | Applying | PO2 |
| 4 | Describe the factors influencing working capital requirements. | CO1 | Understanding | PO1 |
| 5 | The sales of a company are ₹12,00,000 and current assets are 25% of sales. Forecast the working capital requirement using the percent of sales method. | CO3 | Applying | PO3 |

Big Questions – LOCF Mapping Table

| S.No | Big Question | CO | Bloom's Level | PO |
|------|---|-----|-------------------------|-----|
| 1 | Define working capital and discuss its importance in business operations. | CO1 | Understanding | PO1 |
| 2 | Explain the components of working capital and differentiate between gross and net working capital. | CO1 | Understanding/Analyzing | PO1 |
| 3 | Describe the operating cycle and explain its role in determining working capital requirements. | CO1 | Understanding | PO1 |
| 4 | A company has current assets of ₹3,00,000 and current liabilities of ₹1,80,000. Calculate net working capital and interpret its significance. | CO2 | Applying | PO2 |
| 5 | The sales of a firm are ₹15,00,000 and the current assets are expected to be 30% of sales. Forecast the working capital requirement using the percent of sales method and explain the assumptions made. | CO3 | Applying/Analyzing | PO3 |