

**PERIYAR INSTITUTE OF DISTANCE EDUCATION
(PRIDE)**

**PERIYAR UNIVERSITY
SALEM - 636 011.**

**BACHELOR OF BUSINESS ADMINISTRATION (B.B.A.)
THIRD YEAR
PAPER – IX : FINANCIAL MANAGEMENT**

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BACHELOR OF BUSINESS ADMINISTRATION (B.B.A)

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PAPER – IX : FINANCIAL MANAGEMENT

Chapter 1

- 1.0 Introduction
- 1.1 Learning Objectives
- 1.2 Forms of Organisation
- 1.3 Meaning of Financial Management
- 1.4 Definition of Financial Management
- 1.5 Importance of Financial Management
- 1.6 Objectives of Financial Management
- 1.7 Functions of Financial Management
- 1.8 Key activities of Financial Management
- 1.9 Organisation of Financial Management
- 1.10 Role of a financial manager in an organization
- 1.11 Summary
- 1.12 Test of understanding
- 1.13 References and further readings

Chapter – 1

1.0 Introduction

Success is the word which everyone likes and wants to achieve. A businessman is no exception to this fact. He strives hard to make his organization successful. The success of a businessman is measured in his ability to make optimum/maximum profits consistently and continue to excel in business operations over a long period. This can be achieved by the organization only when apart from other things, it has sufficient financial resources to meet its long-term and short-term commitments. It is easy to advise the finance managers to maintain adequate amount of funds, but the problem is how to do it? You may read one or more of the financial management text books that are available in the market and rewrite one on your style but it is difficult to replicate the success of a finance manager in your own way. It is due to that the subject matter of financial management has been changing at a rapid phase. About three decades ago scope of financial management was limited to procuring funds whenever needed and little significance was too attached to the financial decision-making and problem-solving.

Today, the finance manager is not just doing the passive role of a storekeeping of the accounting information and arranging funds, whenever required to do so. Rather finance manager occupies a key position in the top management of a company and plays a dynamic role in solving complex management problems. As a finance manager now responsible for shaping the future of the enterprise and are involved in the most critical management decisions of allocation of capital. It is your duty to ensure that funds are raised economically and used in the most effective and efficient manner. Therefore, this subject of financial management will provide you a conceptual knowledge about the day to day working of a finance manager thereby it will enable you to take better decisions in the dynamic financial environment.

This course material presents the concepts and around which good financial decisions are made, and it explains you how to use these tools in practice. We start this chapter by discussing about finance, various approaches of financial management, different forms of organisation, and introducing you to the responsibilities of financial managers.

1.1 Learning Objectives

After reading this chapter you will be able to understand the following:

- The meaning of Financial Management
- Definition of Financial Management
- Objectives & Significance of Financial Management
- Functions of Financial Management
- Organization structure of Financial Management
- Role of a Finance Manager in an organization

1.2 Forms of Organisation

In India, we can classify the business organisations into three categories i.e. Public, Private and Non-profit organisation. Let us discuss these in brief. Before that, it is better to know the meaning of business organisation. It means something that is carried on with a motive to earn profit/income which is inherent in any business. It does not mean that every business generates profits, but the motive behind every act/transaction in a business would be making profit.

Public sector organizations are part of, or owned by, central, or state government. Example- Indian Oil Corporation Limited, Indian Overseas Bank...

Private sector means that organisations are owned by private individuals which can be classified as under:

- ⊕ **Sole Traders** : An individual who have set up a business unit on his/her own. Here decision making is completely taken by an individual owner.
- ⊕ **Partnership** : “Two or more individuals join together to run a business” is called partnership. Minimum two and maximum 20 members join together and do the business according to the partnership deed (agreement). Profit and loss are shared among the partners according to the partnership deed. If you are interested to register under the partnership Act, you have to follow the government regulation. It is good for all.
- ⊕ **Private Limited Companies:** It refers to a company that is permitted to offer its securities for sale to the private with the

maximum of 50 members. Capital is divided into small parts and the same has been mobilised through known circle viz. Employees, family, relatives and friends. In other words, this type of company does not go for public offer for fund mobilisation. In India names must end in the `Private Limited`. Example: General Motors India Private limited. Here it is required to register under the Companies Act and submit the audited annual financial report at the year ending.

⊕ **Public Limited Companies:** It refers to a company that is permitted to offer its securities for sale to the general public, typically through a stock exchange. In simple words, Capital is divided into small parts which are known as shares and the same has been mobilised through Public participation. It can be further classified into listed and not listed companies. It should register under the Indian Companies Act and submit the audited financial report at the end of the financial year. In India Public Limited companies names must end with the word `Limited (Ltd.)`. Example: Tata Motors Limited, TVS Motors Limited.

Non-Profit Organisation: It is a legally constituted organisation whose primary motive is to render the service without any commercial or monetary benefits. Example: Education institutions, charities, health care and so on.

We hope that you aware of the various forms of organisation and now let us discuss the meaning of finance.

Test of Understandings - 1:

1. Can you list any three private limited and public limited companies?

- | | |
|----------|----------|
| 1. _____ | 1. _____ |
| 2. _____ | 2. _____ |
| 3. _____ | 3. _____ |

2. Can you define the kind of organisation do they belong to? (Cooperative, charity or society)

1.3 Meaning of Finance Management

In our day to day transactions, we all would have heard about the term 'finance', actually what does it mean? If you ask a common man, he or she may reply that it is perceived as equivalent to 'Money', but finance exactly is not money; it is the source of providing funds for a particular activity. The

American Heritage Dictionary of the English Language, (Fourth Edition) defines the term as, "The science of the management of money and other assets or the supplying of funds or capital." Finance as a function (i.e. verb) is defined by the same dictionary as, "To provide or raise the funds or capital or to supply funds to." Therefore, we may define the term finance as "the art and science of money management". Now let us discuss about financial management. In early years, financial management was confined to the raising of funds, but today, "it is that managerial activity which is concerned with the planning & controlling of the firms' financial resources". Finance in the modern world is the life blood of the business economy. We cannot imagine a business without finance because it is essential in all business activities whether the business is small or big. The management of finance is equally important for both profit & non-profit organizations.

1.4 Definition of Financial Management

Financial Management is that specialised function of general management which is related to the procurement of finance and its effective utilization for achievement of organizational goals.

"Financial Management is the application of the planning & control function to the finance functions" - **Howard & Upon**

"Financial management is the operational activity of a business that is responsible in obtaining & effectively utilizing the funds necessary in efficient operation" - **Joseph & Massie**

Test of Understanding:

- | | |
|--|---------|
| 1. Can you define Finance? | Yes/No |
| 2. Can you write the definition of financial management? | Yes/ No |

1.5 Importance of Financial Management

The above definitions clearly indicate the importance of financial management. The significance of financial management is discussed as follows:

- Financial Management leads to the effective and efficient utilisation of available resources and thereby enhances the organisation's performance.
- It provides various tools and techniques for scientific financial analysis in order to make correct decisions.
- It helps you to make proper planning, co ordination and control & monitoring activities to achieve the organisational goal.
- It helps in providing the information to the shareholders about the company's operations and giving assurance for their investments.

1.6 Goals or Objectives of Financial Management

I have a question for you. What do you think should be the objective of company? I hope that your answer may be as given below: As a finance manager, I have to arrange the required funds at an acceptable cost, to ensure those funds are suitably invested/ deposited and to monitor that everything goes according to the financial plan. This results good performance and the same has been distributed among the shareholders/lenders as dividend/interest and partly reinvested into the business, as this process continues over a period of time. Therefore you may say that maximising profits of the business is your goal. But, is your goal a reasonable one? No. It fails for a number of reasons:

- It is Vague
- It ignores Time Value of money
- It ignores Risk Factor
- It ignores the social responsibility of the business unit

That is why we have Wealth Maximisation as an Objective.

Wealth maximisation objective is a widely recognised objective among the business community. The term wealth refers to the market price of the shares of the company. Hence the term wealth maximisation/value maximisation refers to maximising the market value of the company.

$$W = N \times P$$

Where W = wealth of a company

N = number of outstanding shares issued by the company

P = current market price of the shares traded in the stock market

Another perspective is that wealth refers to the net present worth of the company. Therefore, wealth maximisation is also known as net present worth. Net present worth is the difference between gross present worth and the amount of capital investment required to achieve the benefits. Gross present worth represents the present value of expected cash benefits discounted at a rate, which reflects their certainty or uncertainty. Therefore, this objective as decisional criterion suggests that any financial decision creates wealth or has a net present value above zero is desirable one and the same should be accepted and vice versa. If you use this objective as a decisional criterion, it serves as a useful guideline in making good investment decisions. This is because the concept of wealth is very clear. It represents present value of the benefits minus the cost of the investment. The concept of cash flow is more precise in connotation than that of accounting profit. Thus, measuring benefit in terms of cash flows generated avoids ambiguity.

This objective considers time value of money. It recognises that cash benefits emerging from a project in different years are not identical in value. This is why annual cash benefits of a project are discounted at a discount rate to calculate total value of these cash benefits. At the same time, it also gives due weightage to risk factor by making necessary adjustments in the discount rate. Thus, cash benefits of a project with higher risk exposure is discounted at a higher discount rate (cost of capital), while lower discount rate applied to discount expected cash benefits of a less risky project. In this way, the discount rate which is used to determine the present value of future streams of cash earnings reflects both the time and risk.

In view of the above reasons, wealth maximisation objective is considered superior to the profit maximisation objective. It may be noted here that value maximisation objective is simply the extension of profit maximisation to real life situations. Where the time period is short and magnitude of uncertainty is not great, value maximisation and profit maximisation amount almost the same thing. Further, the objective of wealth maximisation reflects the company's responsibilities towards its shareholders, creditors/lenders and employees. On the other hand, the objective of profit maximisation just considers the interest of the owners alone.

1.7 Functions of Financial Management

The finance manager in a company performs various activities to achieve the organisation's goal. It may vary from one to another organisation depending upon the nature and size of the business. In spite of these variations, we are going to discuss some common functions. For the convenience and understanding purpose, it may be classified into two groups based on the nature:

1. Executive finance functions.
2. Incidental finance functions.

A. Executive Finance Functions: Every individual concerned with finance requires administrative skills in planning, execution & control of financial activities. Some of the executive functions are discussed below.

1. ***Mobilisation of Funds:*** As a financial manager, you have to plan for the requirements of funds (for example, do we have any expansion or acquisition, or diversification plan?) And mobilise the required funds from various sources (shares, debentures and loans) as and when it is required at an affordable cost.
2. ***Deployment of Funds:*** This is another important function of a financial manager as a financial manager you have to allocate the available funds among the competing alternatives requirements, because if you take

wrong decision, it affects your company's future profitability, stability and sustainability. In the globalised scenario, you have number of opportunities and select the best one based on the right return profiles of the available opportunities.

3. **Control over the use of funds:** While executing the plan, it is required to monitor continuously in order to ensure the efficient use of funds as you are using other people money.
4. **Risk and return trade off:** There is no reward without risk. Risk is inherent in all your decisions. The level of risk may vary from one to another decision. You have to identify the level of risk and return of the decision and achieve the right balance between the two in order to achieve your company's goal.

B. Incidental Finance Functions: Incidental finance functions are those, which are clerical or routine nature, which are necessary in the execution decisions taken by the executives. Some of the important incidental finance functions are

1. Supervision of cash receipts and payments and safeguarding of the cash balances.
2. Proper custody and safeguarding the important and valuable papers, securities and insurance policies.
3. Taking care of all mechanical details of financing.
4. Record keeping and reporting.
5. Cash planning and credit management.

1.8 Key Decisions of Financial Management

As a financial manager, if you want to achieve the objective of financial management, you have to make four major decisions. The same has been discussed below:

1. **Capital budgeting decision:** Capital budgeting decisions deal with allocation of capital or commitment of funds in the long- term assets that would yield benefits in future. You have to decide the best one, because it involves the large sum of money and irreversibility commits huge losses to the company. These decisions are important as it affects the company's success in achieving its goals, and future.
2. **Capital Structure Decision:** This deals with the financial issues. You have to decide when, where, & how to acquire funds to meet the firm's investment needs. The central issue before that is determine the proportion and combination of various sources of funds which should be at the optimum level.

3. **Dividend Decision:** This decision concerns with the amount of profit earned during the period. You have to decide whether you should distribute all profits or retain the entire amount of profits or distribution of a portion of profit and retain the balance. If you decide to distribute partly, you should decide the proportion of profits which has to be distributed (known as payout ratio) or retained (retention ratio) with you. It is known as dividend policy. It should be an optimum dividend policy as it affects the value of the firm.
4. **Working capital Decision:** The decision concerns with the short term investment decisions to be made by the finance manager of a company in order to run the business smoothly. Not only that, effective utilization of fixed assets depends on the quality of working capital decision. You should synchronize the cash inflows with outflows. Both excessive and inadequate working capital affects the profitability of the firm. It is a challenging task for you to strike the right balance between profitability and liquidity.

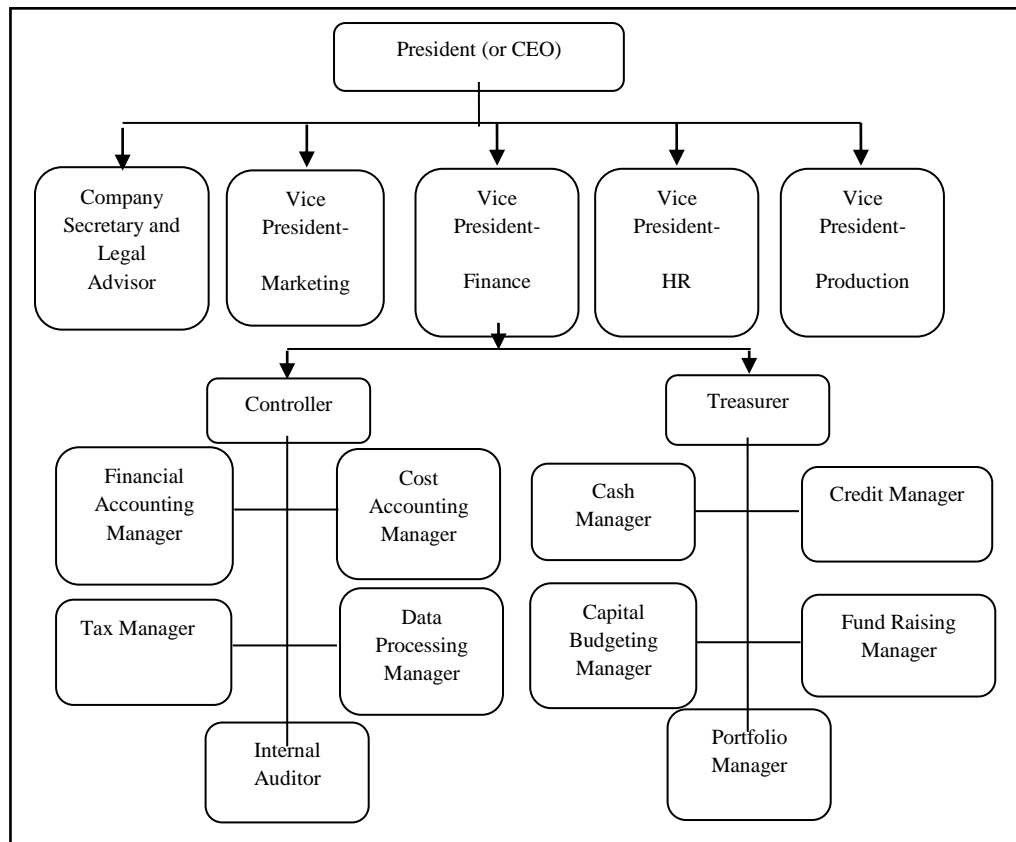
1.9 Organization of Financial Management

In small organizations, say proprietorship or partnership, owner or owners have to perform all the works and there is no separate finance department. At the most, they may appoint a person as an accountant to look after the book keeping and liaising with banks and debtors. But a limited company has a separate department to organize all its financial activities. Imagine that you are working as a financial manager in an organization and I suppose you may have the lot of questions. For example,

- a. What are your tasks or responsibilities?
- b. To whom you have to report or consult?
- c. Who are all working under you?

To give answer for all the above questions, you have to see the organization structure of the financial department. It means the division and the classification of various functions which are to be performed by the finance department. In a big concern, the duties and responsibilities are classified into different compartment and assigned as under:

Figure 1.1
Organization of Finance Function



Adapted from: Financial Management, 4th Edition, by Prasanna Chandra

The division of tasks helps the organisation to reach us goal on time. Also it gives clarity of role to the concerned person which brings his/her fullest efficiency.

Test of understandings – 2 :

1. State any two executive functions of finance managers.

2. State any two reasons for the superiority of wealth maximisation objective over profit maximisation objective.

3. Mention any two key decisions taken by the finance manager.

1.10 Role of Finance Manager

Two decades ago, the scope of finance functions or role of the financial manager was limited in routine works. Now it has got widened. The following are the role of financial managers:

- ♣ **Anticipating Financial Needs:** The finance manager has to predict expected events and estimate the financial requirements. For this he has to collect information from various sources like news papers, magazines in the field of finance, banking, financial services and company data, to estimate the financial requirements through various budgets like cash, production, materials and so on.
- ♣ **Acquiring Financial Resources:** In order to arrange the required funds for the business, it is necessary to decide when, where, how to obtain? How much to obtain the required funds well in advance. The requirement may be short-term or long-term; the finance manager should ensure the availability of funds at any time.
- ♣ **Allocating Funds in Business:** Keeping acquired funds idle will not earn anything. It has to be invested in potentially lucrative investments either long-term or short-term which are also known as 'asset management policy'. Establishing a sound asset management policy is a prerequisite for successful financial management in terms of performance balanced with profitability and liquidity.
- ♣ **Administering the allocation of funds:** After allocating the funds in various potentially lucrative opportunities, monitoring the performance is the basic responsibility of a financial manager. This will increase the efficiency of the management of funds.
- ♣ **Analysing the Performance of Finance:** The next step of the manager is to compare the actual performance to standards. The returns from the investments should be continuous and consistent. If there are any deviations, necessary steps should be taken to overcome them.
- ♣ **Accounting and Reporting to Management:** The Finance Manager is responsible for maintaining records which contains information about the performance of financial decisions and which has to be informed to top management for controlling purpose. If need arises, he has to offer his suggestions to the top management in order to improve the overall functioning of the organisation.

1.11 Summary

The financial manager's role has changed over the last five decades. He occupies a key position in the organisation and plays a dynamic role in solving complex management problems. He is now responsible for shaping the future

of the enterprises and is involved in the most critical management decisions. It is his duty to ensure that funds are raised economically and used in the most effective and efficient manner. Therefore, this subject of financial management will provide you conceptual knowledge about the day to day working of a finance manager thereby it will enable you to take better decisions in the dynamic financial environment.

1.12 Self Assessment Questions

1. “Finance is the life blood of business”- discuss this statement.
2. Define financial management. Discuss its main functions.
3. Discuss the role of financial managers.
4. Explain the key activities of financial managers.
5. How the objective of wealth maximisation is superior to the profit maximisation objective? Explain in detail.
6. What are the goals of financial management?
7. What are the four financial decisions? Explain.
8. Explain profit maximisation and wealth maximisation.
9. Define the term ‘finance function’ and examine the functions of financial manager in an organisation.
10. What are the main functions of finance manager?
11. Explain finance function and show how the financing, investment and dividend decisions of a company can help to attain this objective?

1.13 References and Further Readings

1. Pandey I M, Financial Management, 9th Edition, Vikas Publishing House Private Limited, New Delhi.
2. Khan and Jain, Financial Management (Text, Problems, and Cases), 5th Edition, Tata McGraw Hills Limited, New Delhi.
3. Prasanna Chandra, Financial Management, 5th Edition, Tata MaGraw Hills Limited, New Delhi.
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Chapter - 2
COST OF CAPITAL

- 2.0 Introduction
- 2.1 Learning Objectives
- 2.2 Definition of cost of capital
- 2.3 Concept of cost of capital
 - 2.3.1 Components of cost of capital
 - 2.3.2 Classification of cost of capital
- 2.4 Importance of cost of capital
- 2.5 Types of Capital
- 2.6 Computing Specific cost of Capital
 - 2.6.1 Cost of Debt
 - 2.6.2 Cost of Preference share capital
 - 2.6.3 Cost of Equity Capital
 - 2.6.4 Cost of Retained Earnings
- 2.7 Overall cost of capital
- 2.8 Summary
- 2.9 Self Assessment Questions
- 2.10 References and further readings Problems

2.0 Introduction

Business organisation requires finance to meet the requirements. The requirements can be classified into long term and short term requirements. The long term sources are used for expansion, diversification, modernisation, replacements, and other similar long term decisions. All these decisions involve large sum of money. Suppose, you would like to reverse these decisions, you have to forgo the substantial amount of investments. It indicates the importance of long term decisions. Based on the nature of requirement, you have to find the sources of funds. Mismatch between the sources and the investment decisions will result in heavier interest burden, in turn, affect the profit level of the project. While deciding on the investment decisions, you should consider the costs and means of finance of the decision.

There are a host of finance options available for a company to fund the long term requirement namely equity capital, preference capital, debenture capital and so on. The cost of sources has been denoted as the cut-off rate, the minimum required rate of return, rate of interest, target rate, discount rate etc. Technically speaking, this discount rate is known as the cost of capital. The concept of cost of capital is an important and fundamental concept of the theory of financial management. We know that the fundamental objective of the business is to maximize the wealth of shareholders in the long run. So, keeping this objective in mind, as a manager you have to invest your funds only in those projects which give returns in excess of the cost of funds invested in the projects of the business concern. In this chapter, we are going to learn how to determine the cost of funds, if it is raised from different sources.

2.1 Learning Objectives

After reading this chapter, you will be able to:

- a. State the meaning of cost of capital
- b. describe the concepts and importance of cost of capital
- c. describe types of capital
- d. explain the concept of weighted average cost of capital
- e. state the determinants of cost of capital
- f. Calculate the cost of specific sources and overall sources of capital

2.2 Definition of Cost of Capital

Cost of capital is the rate of return that must be realised in order to satisfy the investors. More specifically, "*cost of capital*" is defined as

"The minimum required rate of earnings or cut-off rate of capital expenditures" - SOLOMON EZRA.

"The rate that must be earned on the net proceeds from the proposal to provide the cost of elements of the burden at the time they are due" - HUNT, WILLIAM & DONALDSON.

2.3 Concepts of cost of capital

Cost of capital has two aspects to it:

- The cost of funds that a company raises and uses for a project and the return that a company requires to earn from its projects as investors expect to be paid for their investments into the company. It is therefore the minimum return that a company should make on its own investments, to earn the cash flow out of which investors can be paid their return, but it is not cash as such.
- The cost of capital of a company is its opportunity cost of finance, because it is the minimum return which an investor requires. For shareholders it is the dividend that they expect to receive plus a capital gain on the value of their shares. While for lenders it is the rate of interest which is quoted on the loan agreement. Failure to pay such required return will result in the providers of finance transferring their holdings to other opportunities with a better rate of return. Thus, it is the minimum rate of return that will result in at least maintaining the value of its equity shares or increasing if possible.
- Normally it is related to long term funds.
- The cost of capital has three elements:
 - a. **Risk free rate of return:** Risk averse investors expect the required return from a completely risk free investment. E.g. yield on government securities.
 - b. **Business risk premium:** Increase in required rate of return due to uncertainty about future business prospects. All types of investors should bear this risk.
 - c. **Financial risk premium:** Dangers of high debt levels, variability in equity earnings after payments to debt capital holders.

Symbolically cost of capital may be represented as

$$K = r_o + b + f$$

where K = Cost of capital.

r_o = Normal rate of return at zero risk level.

b = Premium for the business risk.

f = Premium for the finance risk

2.3.1 Components of Cost of Capital

A company's cost of capital consists of three components:

- a. Purchase power risk. It arises due to change the in purchasing power of money i.e time value of money
- b. Money rate risk: it means the risk of an increasing interest rate in future
- c. Liquidity risk: it means the ability of a supplier to sell his/her shares/debentures immediately.

2.3.2 Classification of Cost

You may classify the cost based on the nature. It is necessary to understand the following classification:

1. **Historical cost & Future cost:** Historical costs are related to the past. It is also known as book cost. On the other hand, Future costs refer to costs that are expected to be incurred (estimated costs) in the future while procuring the funds. In financial decisions future costs are relatively more relevant than the historical cost. However, historical cost act as a guide for the estimation of future costs.
2. **Specific cost and composite cost:** The cost of individual component of capital i.e, equity shares, preference shares, and debentures, is known as specific cost of capital. Composite or combined cost of capital is inclusive of all costs of capital from all sources (i.e., equity, preference, and debentures). In capital investment decisions , the composite cost of capital will be used as a basis in accepting or rejecting the proposal , even though the company may finance one proposal from one source of financing (say equity) while another proposal employing another source of financing (say debentures). This is because it is the overall mix of financing over time, which is important in valuing the firm as an ongoing entity.
3. **Average cost and marginal cost:** Average cost refers to the combined cost of various sources of capital such as equity, preference and debentures. It is the weighted average cost of the costs of various sources of finance. Marginal cost of capital refers to the average cost of capital which has to be incurred to obtain additional funds required by a

firm. In investment decision, it is the marginal cost which should be taken in to consideration.

4. **Explicit cost and implicit cost:** In general explicit costs are apparent costs which are shown in the financial statements of a company. (Example selling cost, raw material cost direct labour cost etc.) In the context of cost of capital, explicit costs are costs incurred in employing explicit sources of funds such as equity capital, preference capital, debentures and term loans. On the other hand, implicit costs are costs incurred in employing (using) implicit sources of funds such as spontaneous liabilities (creditors and provisions). Further implicit cost also known as opportunity cost. It is the cost of the opportunity foregone in order to take-up a particular project. For ex:- The implicit cost of retained earnings is the rate of return which would have been available to shareholders by investing the funds elsewhere.

Test of understanding -1:

1. Define explicit cost and marginal cost.
2. Can you state the various types of risks associated with the concept of cost of capital? Yes/ No
3. Can you define “cost of capital”? Yes/No

2.4 Significance / Importance of the cost of capital

The concept of cost of capital is very important in the financial decision making, because it is the amount, expressed as a percentage per annum, which a company must pay to obtain adequate funds from the investors. It can also be used as a basis in evaluating the performance of a firm and it further helps management in taking the following decisions.

- a. **As a accept criterion in capital budgeting:** The cost of capital is a key input in making the investment decisions of the company. It is used as the discount rate in deciding whether to accept or reject the proposal.
- b. **As a determinant of capital mix in capital structure decisions:** It is most important to find the (debt-equity) capital mix of a firm. While designing an optimal capital structure, the management has to keep in mind the objectives of maximising the value of the firm and minimising the cost of capital. Hence, Measurement of cost of capital from various sources is very essential in planning the capital structure of a firm.
- c. **As a basis in evaluating the financial performance:** In the words of S.K.Bhattacharya the concept of cost of capital can be used to 'evaluate the financial performance of top management'.

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

- d. *As a basis for taking other financial decisions:* The cost of capital is also used in making other financial decisions such as:
 - Dividend policy and Capitalization of profits
 - Making right issue
 - Working capital Decisions

2.5 Types of Capital

There are three types of capital that are important for you to know when analysing your business decisions or potential investments. Each type has its own benefits and characteristics. As a finance manager, you have to analyse and identify the proper mix of capital structure for your company. Here we are going to discuss in brief the types of capital.

- a. Equity share capital
- b. Preference share capital
- c. Debt Capital (Borrowing loan from bank or issue of debentures/bonds)

These three types of capital distinguish amongst themselves mainly in terms of their risk, return and ownership pattern.

- a. **Equity Capital:** This is an important source of finance for the business. It is an exchange of money for a share of business ownership. It is also known as “net worth” or “book value” (Equity share capital + Reserves & surplus). Equity financing is generally meant for businesses with fast and high growth potential. The advantage of equity capital is that company does not have any obligation for payment of dividends and it offers permanent funds with limited liability for repayment. However, the major disadvantage of equity financing is the dilution in the ownership interests and the possible loss of control of existing equity shareholders that may accompany with the additional (new) issue equity shares. The cost of capital is higher for equity shares compared to other sources of capital. It is due to, firstly equity dividends are not tax deductible expenses, Secondly, the cost of issue is very high.

Note: Reserves and surplus represent the accumulated after tax earnings of the (equity shareholders) company.

- b. **Preference share Capital:** Preference share capital has some similar characteristics to equity and debentures. For example, it is similar to

equity shares as there is no obligation for payment of dividends and the preference dividend is not tax deductible. However, They (preference shareholders) are getting fixed rate of dividend. They have preference over the equity shareholders in getting dividend and capital repayment in the event of liquidation of the company. Preference shares can be classified in three ways:

- i. **Cumulative or non-cumulative preference shares:** sometimes due to insufficient fund position, a company could not pay the dividend to the preference shareholders. In such case, when the company earns adequate amount of profits in the future period, the company has the liability to pay all the arrears along with the (present) current year dividend to the preference shareholders even before distributing the equity dividends. A preference share enjoying the above stated benefits is known as cumulative preference shares. On the other hand, non-cumulative preference shares holders are not getting dividend on cumulative basis.
 - ii. **Redeemable or perpetual preference shares:** Redeemable preference share holders are getting their investments (capital) back after a given maturity period while perpetual preference share capital remains with the company forever.
 - iii. **Convertible or non-convertible shares:** Convertible shares can be converted in to equity after some time period. On the other hand, non-convertible preference shares do not have such option and are redeemed on maturity date.
- c. **Debt Financing:** Debt financing means borrowing money from bank or lenders through issue of bonds or debentures that is repaid over a period of time, usually with interest (paid annually). Debt typically carries fixed burden to the company, whether or not you have positive cash flow. Interest on the loan is payable and the financing cost is a relatively fixed expense, Debt financing is usually available to all types of businesses and most business owners go to their banks for such loans. In smaller businesses, personal guarantees are likely to be required. Debt financing includes asset-based financing, leasing, trade credit and various loans that require repayment, with accumulated interest, at some future date. Debt financing does not dilute any ownership interests in a business unit.

Test of Understanding -2

1. Can you state any two advantages of equity capital?
Yes/No
2. Can you distinguish between preference share and debentures?
Yes/No
3. Can you recall the importance of cost of capital?
Yes/No

2.6 Computation of cost of specific sources of finance.

As indicated above for measuring the firm's overall cost of capital, it is necessary to calculate the cost of specific sources of finance. Therefore, let us discuss first how to calculate the cost of capital of a specific source.

2.6.1 Computation of Cost of Debt

As you know it very well that debt is an important component of capital structure which may be in the form of debentures, bonds, term loans from financial institutions and banks and so on. As already indicated above, it carries a fixed rate of interest payable to the lenders on agreed time, irrespective of the profit earnings of the company.

An important point to be noted here is that interest payments paid by the company is eligible for tax deduction. Since interest expenses give the tax benefits to the company, it is better to include debt components in its capital structure, because optimum level of debt helps the company to increase its Earnings per Share (EPS). Let us discuss this concept with example.

Example 2.1

Sivam Auto Ltd. has earned a profit before interest and tax of Rs. 5,00,000 for the year ended 31st March 2008. Calculate its profit after tax in the following situation:

- The company has entirely financed its project through issue of 3,00,000 equity shares of Rs 10 each.
- The company has financed its project through issue of 1,00,000 equity shares of Rs 10 each and 20,000 10% debentures of Rs 100 each.

The company's applicable corporate tax rate is 35%.

Calculation of Earnings Per Share

| Particulars | Situation 1 | Situation 2 |
|--------------------------------------|-------------|-------------|
| Profit before interest and tax | 500000 | 500000 |
| Interest | - | 200000 |
| Profit after interest but before tax | 500000 | 300000 |

| | | |
|---|--------|--------|
| Tax | 175000 | 105000 |
| Profit after tax | 325000 | 195000 |
| No of Equity shares | 300000 | 100000 |
| EPS (Profit after tax/No. of Equity shares) | 1.83 | 1.95 |

This example shows about the tax benefits. By using the debt capital (tax benefits), you can enhance the EPS of the owners i.e. equity shareholders is increased by Re.0.867 (i.e. Rs 1.950-Rs 1.083)

From the above discussion, it is clear that you may need the following information to apply the formulation of cost of debt:

- a. Inflows (i.e. net cash proceeds from the issue of debentures)
- b. Outflows (i.e. interest and principle repayment details)

Debt may be issued at par, at premium or discount. It may be perpetual or redeemable. The technique of computation of cost each case has been explained in the following pages:

Debt issued at par:

$$K_{da} = I(1-T) / P$$

Where K_{da} = Cost of debt after tax

I = Interest payable

T = Tax rate

P = Proceeds

Debt issued at premium or discount:

$$K_{da} = I(1-T) / NP$$

Where K_{da} = Cost of debt after tax,

I = Annual interest payment

NP = Net Proceeded of loans / debentures,

T = Tax rate

$$K_{db} = I / NP$$

Where K_{db} = Cost of debt before tax,

I = Annual interest payment

NP = Net proceeds of loans / debentures,

T = Tax rate

Net Proceeds: Proceeds + Premium – floatation cost or Proceeds - Discount – floatation cost

Example 2.2

A company issues 10% irredeemable debenture of Rs.1, 00,000. The cost of floatation debentures is 5%. The company is in 55% tax bracket. Calculate the cost of debt (before tax as well as after tax) if the debentures are issued at:

(i) par (ii) 10% discount and (iii) 10 % premium.

First, you have to calculate net proceeds from the issue:

| | |
|-----------------------------|---------------|
| Total Issue Amount | Rs. 1, 00,000 |
| Less: Floatation cost | Rs. 5000 |
| Net proceeds from the issue | Rs. 95,000 |

Please note that net proceeds will change if debentures are issued at discount or premium:

| Particulars | Premium | Discount |
|--------------------------------|-------------|---------------|
| Total Issue Amount | Rs. 100,000 | Rs. 1, 00,000 |
| Less: Floatation cost | Rs. 5,000 | Rs. 5,000 |
| | Rs. 95,000 | Rs. 95,000 |
| Less: Discount or Add: Premium | Rs. 10,000 | Rs. 10,000 |
| Net proceeds from the issue | Rs. 105,000 | Rs. 85,000 |

(i) issued at par

$$\begin{aligned}K_{db} &= (I / NP) \times 100 \\ &= 10,000 / 95,000 \\ &= 0.1052 \times 100 = 10.52 \%\end{aligned}$$

(ii) issued at discount

$$\begin{aligned}K_{db} &= (I / NP) \times 100 \\ &= 10,000 / 85,000 \\ &= 0.1176 \times 100 = 11.76\%\end{aligned}$$

Like wise, you can convert the following into percentage or keep as it is.

$$\begin{aligned}K_{da} &= I (1-T) / NP \\ &= 10,000(1-0.55)/95,000 \\ &= 0.04737\end{aligned}$$

$$\begin{aligned}K_{da} &= I (1-T) / NP \\ &= 10,000(1-0.55)/85,000 \\ &= 0.0529\end{aligned}$$

(iii) issued at premium

$$\begin{aligned}K_{db} &= I / NP \\ &= 10,000 / 1, 05,000 \\ &= 0.0952\end{aligned}$$

$$\begin{aligned}K_{da} &= I (1-T) / NP \\ &= 10,000(1-0.55) / 1, 05,000 \\ &= 0.0429\end{aligned}$$

Cost of redeemable debt:

Usually, the debt is issued to be redeemed after a certain period during the lifetime of a company; such a debt issue is known as redeemable debt. The cost of redeemable debt capital may be computed as below:

$$K_{db} = \frac{I+(P-NP) / N}{(P+NP) / 2}$$

$$\left[K_{da} = \frac{I+(P-NP) / N \} (1-T)}{(P+NP) / 2} \right]$$

Where
 I = Annual Interest payment
 P = Maturity value of debentures.
 NP = Net proceeds of debentures.
 N = Number of years to maturity.

Example 2.3

A firm issues debentures of Rs.1, 00,000 and realises Rs.98, 000 after allowing 2 per cent commission to brokers. The debentures are due for maturity at the end of the 10th year at par. You are required to calculate the effective cost of debt before tax as well as after tax.

$$K_{db} = \{ I+(P-NP) / N \} / \{ (P+NP) / 2 \}$$

$$= \{ 10,000+(1,00,000-98,000)/10 \} / (1,00,000+98,000)/2$$

$$= 0.103 \text{ (or) } 10.3 \%$$

$$K_{da} = \{ I+(P-NP) / N \} (1-T) / \{ (P+NP) / 2 \}$$

$$= \{ 10,000+(1,00,000-98,000) / 10 \} (1-0.5) / \{ (1,00,000+98,000)/2 \}$$

$$= 0.05 \text{ (or) } 5 \%$$

Example 2.4

ABC Ltd. issues 15% debentures of face value of Rs.100 each, redeemable at the end of 7 years. The debentures are issued at a discount of 5% and the flotation cost is estimated to be 1%. Find out the cost of capital of debentures given that the firm has 50% tax rate.

$$K_{db} = \{ I+(P-NP) / N \} / \{ (P+NP) / 2 \}$$

$$= \{ 15 + (100 -94)/7 \} / (100+94)/2$$

$$= 0.1705 \text{ (or) } 17.05 \%$$

$$K_{da} = \{ I+(P-NP) / N \} (1-T) / \{ (P+NP) / 2 \}$$

$$= \{ 10,000+(1,00,000-98,000) / 10 \} (1-0.5) / \{ (1,00,000+98,000)/2 \}$$

$$= 0.0853 \text{ (or) } 8.53\%$$

Test of understanding- 3

1. A company issues 1000, 10 per cent debentures of Rs.100 each at a premium of 5 per cent with a maturity period of 10 years. Tax rate is 40 per cent. Find the cost of debt.

2. ABC limited issue 2000, 10 per cent debentures of Rs.100 each at a discount of 10 percent. Tax bracket is 40 per cent. Calculate the cost of capital.

2.6.2 Cost of preference share capital

Preference shares are the fixed cost bearing securities. The rate of dividend is fixed well in advance at the time of their issue. So, the cost of capital of preference shares is equal to the ratio called current dividend yield. The cost of preference capital, which is perpetual, can be calculated on

$$K_p = PD / NP$$

Where K_p = Cost of preference shares.

PD = Preference Dividend

NP = Net proceeds.

Here also the method of calculation of net proceeds is the same, for remembrance, preference shares are issued at premium or discount or when costs of flotation are incurred at the time of issue of preference shares, the nominal or par value of preference shares capital has to be adjusted to find out the net proceeds from the issue of preference shares. You should note that the dividends are paid after the tax. Therefore, while computing the cost of preference shares, tax rate should not be taken into account.

Cost of redeemable preference shares:

$$K_p = \{PD + (P-NP) / n\} / \{ (P + NP) / 2 \}.$$

Where K_p = Cost of preference shares.

PD = Preference Dividend

NP = Net proceeds.

N = Maturity period

Example 2.5

A company raised preference shares capital of Rs.1, 00,000 by issue of 10% preference shares of Rs.10 each. Calculate the cost of preference shares capital when they are issued:

(i) 10% premium and (ii) at 10% discount .

(i) When the shares are issued at 10% Premium

$$\begin{aligned}K_p &= PD / NP \\ &= 10,000 / 1, 10,000 \\ &= 0.909\end{aligned}$$

(ii) When preference shares are issued at 10% discount

$$\begin{aligned}K_p &= PD / NP \\ &= 10,000 \times 100 / 90,000 \\ &= 0.1111\end{aligned}$$

Example 2.6

A company has 10% redeemable preference shares of Rs. 100000, redeemable at the end of the 10th year from the year of their issue. The underwriting costs come to 2%. Calculate the effective cost of preference share capital.

$$\begin{aligned}K_p &= \{D + (P-N_p) / n\} / \{ (P + N_p) / 2 \} \\ &= \{10,000 + (1,00,000 - 98,000)\} \\ &\quad (1, 00,000 + 98,000) / 2 \\ &= 0.1030\end{aligned}$$

Test of understandings - 4

1. A company issues 10,000, 10% preference shares of Rs. 100 each. Cost of issue is Rs.2 per share. Calculate cost of preference capital if these shares are issued. (a) par (b) @ 10% premium (c) @ 5% discount.

2. A company issues 1000 7% preference shares of Rs.100 each at a premium of 10% redeemable after 5 years at par. Compute the cost of preference capital.

2.6.3 Cost of Equity Share Capital

The computation of the cost of equity capital is a difficult task as it is based upon the stream of future dividends and share price movements which is expected by the shareholders. The cost of equity is not the out-of-pocket cost because equity shareholders are not paid dividend at a fixed rate every year. Moreover, payment of dividend is not legally binding. It may or may not be paid. But it doesn't mean that equity share capital is a cost free capital. Generally the cost of equity capital indicates the minimum rate which must be earned on projects before their acceptance and the raising of equity funds to finance those projects. Several models have been proposed. Most notable among them are the models as follows:

A. Dividend Yield Method or Dividend Price ratio Method: According to this method, the cost of equity capital is the discount rate that equates the present value of expected future dividends per share with the net proceeds (or current market price) of a share.

$$\text{i.e., } K_e = D / NP \text{ or } D / MP$$

Where D = Expected dividend per share.

NP = Net proceeds per share

MP = Market price per share

Basic assumption underlying this method is that the investors give prime importance to dividends and risk in the firm remains unchanged. Though this approach is simple, it suffers from two serious weaknesses:

1. It does not consider future earning or retained earnings.
2. It does not take into account the capital gains.

Note: This method of computing cost of equity capital is suitable only when the company has stable earning and stable dividend policy over a period of time.

Example 2.7

A company issues 1000 equity shares of Rs.100 each @ premium of 10%. The company has been paying 20% dividend to equity shareholders in the past five years and expects to maintain the same in the future also. Compute the cost of capital. Will it make any difference if the market price of equity share is Rs.160/-?

$$\begin{aligned} K_e &= (D / NP) \times 100 \\ &= 20 \times 100 / 110 \\ &= 18.18\% \end{aligned}$$

$$K_e = [D / MP] \times 100$$

$$= 20 \times 100 / 160$$

$$= 12.5\%$$

B. Dividend price Plus Growth (D/P + G) approach: When the dividends of the firm are expected to grow at a constant rate and the dividend pay-out ratio is constant. This method may be used to compute the cost of capital.

$$K_e = (D / NP) \times 100 + G \% \text{ (or) } (D / MP) \times 100 + G \%$$

Where K_e = Cost of Equity Capital

D = Equity Dividend

NP = Net proceeds

G = Growth rate

MP = Market price

Example 2.8

A company plans to issue 1000 new shares of Rs.100 each at par. The floatation costs are expected to be 5% of the share price. The company pays a dividend of Rs.10 per share initially and the growth in dividends is expected to be 5%.

(a) Compute the cost of new issue of equity shares.

(b) If the current market price of an equity share is Rs.150, calculate the cost of existing equity share capital.

$$K_e = (D / NP) \times 100 + G \%$$

$$= (10 / [100-5]) \times 100 + 5\%$$

$$= 15.53\%$$

$$K_e = (D / MP) \times 100 + G$$

$$= (10 / 150) \times 100 + 5\%$$

$$= 11.67\%$$

C. Earning Yield / Price approach: According to this method, the cost of equity capital is the discount rate that equates the present values of the expected future earnings per share with the net proceeds (or, current market price) of a share.

$$K_e = EPS / NP \text{ (or) } EPS / MP.$$

Where EPS = Earnings per share

NP = Net-proceeds

MP = market price.

How to calculate the EPS? The following table helps to compute the Earning Per Share:

| Particulars | Amount |
|--|--------|
| Earnings before interest and taxes (EBIT) | |
| Less: Interest | |
| Earnings after interest but before taxes | |
| Less: Taxes @ ---- | |
| Earnings after taxes (EAT) | |
| Less: Preference Dividend | |
| Earnings available for Equity shareholders (EAS) | |
| No. of Equity shares | |
| EPS = [earnings available for shareholders/ no. of equity shares] | |

This method of computing cost of equity may be employed in the following cases:

1. When the earning per share (EPS) is expected to remain constant.
2. When the dividend payout ratio is 100% or when the retention ratio is zero. i.e., available profits are distributed as dividends.
3. When a firm is expected to earn an amount of new equity shares capital, which is equal to the current rate of earnings.
4. The market price of the share is influenced only by EPS.

Example 2.9

A firm is considering an expenditure of Rs.60 lakhs in expanding its operation. The relevant information is as follows:

| | |
|--------------------------------|-----------------|
| No. of existing equity shares | = 10 lakhs |
| Market value of existing share | = Rs.60/- |
| Net earning | = Rs. 90 lakhs. |

Compute the cost of existing equity share capital and of new 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.

Cost of existing equity share capital,

$$\text{EPS} = 90,00,000 / 10,00,000 = 9$$

$$K_e = (\text{EPS} / \text{MP}) \times 100$$

$$= (9 / 60) \times 100$$

$$= 15\%$$

Cost of new equity capital,

$$K_e = \text{EPS} / \text{NP}$$

$$= 9 \times 100 / (52-2) = 18\%$$

D. Realised yield approach: Future is uncertain. It is not possible to estimate future dividends and earnings correctly. To remove this drawback, the realised yield approach, which takes into account of the company's earnings in the past, it may be applied to compute the cost of equity capital.

Assumptions:

- (a). The firm will remain in the same risk class over the period.
- (b). The shareholders expectations are based on the past realised yield.
- (c). The investors get the same return on the realised yield even if they invest elsewhere.
- (d). The market price of the company's shares do change significantly.

Example 2.10

Mr. White purchased 5 shares in a company at a cost of Rs.240 on Jan.,1 , 1987 . He held them for 5 years and finally sold them in January, 1992 for Rs.300/-. The amount of dividend received by him during for the 5years was as follows:

| | | | | | |
|------|-------|-------|-------|-------|-------|
| Year | 1987 | 1988 | 1989 | 1990 | 1991 |
| Rs. | 14.00 | 14.00 | 14.50 | 14.50 | 14.50 |

You are required to calculate the cost of equity capital.

| Year | Dividend | sale proceeds | Premium | Present value Factor@10% |
|------|----------|---------------|---------|-----------------------------|
| 1987 | 14.00 | | 0.909 | 12.7 |
| 1988 | 14.00 | | 0.826 | 11.6 |
| 1989 | 14.50 | | 0.751 | 10.9 |
| 1990 | 14.50 | | 0.683 | 9.9 |
| 1991 | 14.50 | | 0.621 | 9.0 |
| 1992 | 300 | | 0.621 | 186.3 |
| | | | | 240.4 |

Therefore the cost of capital is 10%.

2.6.4 Cost of Retained Earnings

Retained earnings are undistributed profits and represented by uncommitted reserves and surplus. In simple way, company makes money (earnings), to whom you pay that dividend? The shareholders, right? But when you retain earnings you are not distributing the dividend to the shareholders. You are keeping it. What is the purpose? You are using that amount for investing it in your company. Well those shareholders want some return on that money you are keeping with the business. How much return do they expect?

They want the same amount as if they had got the retained earnings in the form of dividends, and bought more stock in your company for that amount. That is the cost of retained earnings. You as a finance manager, have to ensure that if you are retaining the earnings of the company, then the shareholders will get at least as good a return on the money as if they had re-invested the money back into the company.

If you don't understand this, re-read it and re-think it until you do get it. Really there is no "cost" in the cost of retained earnings. I mean that no amount of money is changing hands (between you and your shareholders). You aren't paying anyone anything, but you are keeping the shareholders money. You can't say it is "free" from cost. Frankly if you did, it would impair your capital budgeting. So when you are utilising retained earnings in your business, you must ensure that the project or business earns the cost of retained earnings.

$$K_r = K_e (1-T) (1-B)$$

Where, K_r = Required rate of return on retain earnings.

K_e = Shareholders required rate of return

T = Tax rate; B = Brokerage cost.

Example 2.11

A firm's $K_e = 15\%$, the average tax rate of shareholders is 40% and it is expected that 2% is brokerage cost that shareholders will have to pay while investing their dividends in alternative securities. What is the cost of retained earnings?

$$\begin{aligned} K_r &= K_e (1-T) (1-B) \\ &= 15\% (1-0.40) (1-0.02) \\ &= 15\% (0.6) (0.98) \\ &= 8.82\%. \end{aligned}$$

Test of understanding - 5

1. Can you explain how the cost of retained earnings calculated?
Yes/No
2. A firm's cost of equity capital is 12per cent and tax rate of majority of shareholders is 35 per cent. Brokerage is 3 per cent. Find the cost of retained earnings.

2.7 Computation of weighted average cost of capital

Every company has a capital structure which consists of various sources namely, equity, preference shares, and various forms of debt capital. Each sources of capital has its own cost. WACC is the average cost of a company's different sources of finance. It is also known as composite cost of capital, overall cost of capital, average cost of capital, and weighted marginal cost of capital. To compute WACC, you have to employ the weights. It may be book value or market value. Book value weights are based on accounting values to assess the proportion of each type of sources in the capital structure. Market value weights are based on market value. If there is any difference between the market value and book value weights, the weighted cost of capital will also differ. The market value weights are preferred than the book value weights because the market value represents the true value of the investors. However, the market value weights suffer from the following limitations.

- (1) It is very difficult to determine the market values because of frequent fluctuations.
- (2) With use of market value weights, equity capital gets greater importance.

Example 2.12

From the following capital structure of a company, calculate the overall cost of capital, using (a) Book value weights and (b) Market value weights.

| Sources | Book value | Market value |
|-------------------------------|------------|--------------|
| Equity shares (Rs.10 / share) | 45,000 | 90,000 |
| Retain earnings | 15,000 | ----- |
| Preference share capital | 10,000 | 10,000 |
| Debentures | 30,000 | 30,000 |

The after tax cost of different sources of finance is as follows:

Equity: 14% ; Preference share capital: 10%; Retained earnings: 13% ; Debentures: 5%

a. Using Book Value Weights

| Sources | Amounts | Proportion | after tax cost weighted cost | | |
|--------------------------|---------|------------|------------------------------|----------------------|-------|
| (1) | (2) | (3) | (4) | (5) | (6) |
| | | | | (2)X(4) (3)X(4)]x100 | |
| Equity | 45,000 | 0.45 | 14% | 6,300 | 6.3% |
| Retained earnings | 15,000 | 0.15 | 13% | 1,950 | 1.95% |
| Preference share capital | 10,000 | 0.10 | 10% | 1,000 | 1.00% |

| | | | | | |
|------------|----------|------|----|--------|--------|
| Debentures | 30,000 | 0.30 | 5% | 1,500 | 1.50% |
| | 1,00,000 | | | 10,750 | 10.75% |

Weighted average cost of capital = $10750 \times 100 / 1,00,000$
= 10.75%.

Workings:

Proportion = $45,000 \times 100 / 1,00,000 = 0.45$
= $15,000 \times 100 / 1,00,000 = 0.15$
= $10,000 \times 100 / 1,00,000 = 0.10$
= $30,000 \times 100 / 1,00,000 = 0.30$

Weighted average cost of capital (market value weights) :-

| Sources | Amounts | Proportion | after tax | weights |
|------------|---------|------------|-----------|---------|
| [1] | [2] | [3] | [4] | [5] |
| Equity | 90,000 | 0.692 | 14% | 9.688% |
| Preference | 10,000 | 0.077 | 10% | 0.770% |
| Debentures | 30,000 | 0.231 | 5% | 1.155 % |
| | | | | 11.613% |

2.8 Summary

Cost of capital is a key parameter used to evaluate investment proposals. It is more important in capital intensive businesses. The cost of capital reflects the opportunity cost of funds for investment in companies and the level of risk associated with company. If their investments were expected to earn a return below their cost of capital, investor would have to go for superior alternatives for their investments. Generally investors expect the projects with lower risk and more return. Therefore, as a finance manger, you have to compute the correct cost of capital in order to attract the investors, in turn, to fulfil the requirements.

2.9 Self Assessment Questions/ Problems:

1. Define cost of capital?
2. State the importance of cost of capital.
3. How will you calculate the cost of debt? Give example.
4. The shares of a company are selling at Rs.40 per share and it had paid a dividend of Rs.4 in the last year . The investor's expect a growth rate of 5% per year in the dividend.

(a) Compute the company's equity cost of capital. (b) If the anticipated growth rate in dividend is 7% per annum, calculate the indicated market price share.

5. From the following details of X Ltd., calculate the cost of equity capital

1. Each equity share is of Rs.150 each
2. The underwriting cost per amount to 2%.
3. The following rate of dividend was paid by the company in the last five years.

| Year | 1987 | 1988 | 1989 | 1990 | 1991 |
|------------------|-------|-------|-------|-------|-------|
| Dividend / share | 10.50 | 11.00 | 12.50 | 12.75 | 13.40 |

4. The company has a fixed dividend payout ratio.
5. The expected dividend on the new shares amount to Rs.14.10 / share.

2.10 References and Further Readings

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3. Lawrence J Gitman, 2001, Principles of Managerial Finance, 9th Edition, Pearson Education Asia.
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Chapter - 3
CAPITAL BUDGETING

- 3.0 Introduction
- 3.1 Learning Objectives
- 3.2 Meaning and Definition of capital budgeting
- 3.3 Nature of Capital Budgeting
- 3.4 Importance of Capital Budgeting Decisions
- 3.5 Capital Budgeting Decision Process
- 3.6 Basics of Capital Budgeting
- 3.7 Factors influencing capital budgeting decisions
- 3.8 Motives behind the capital budgeting decisions
- 3.9 Characteristics of a sound investment evaluation
- 3.10 Estimation of cash flows
- 3.11 Summary
- 3.12 Self Assessment Questions
- 3.13 References and Further Readings

3.0 Introduction

Investment decisions deal with the ways of employing the funds mobilised by the firm in productive activities to achieve the firm's overall goal. In other words, how much should be invested and what assets should be invested in? Funds are invested in both short-term and long-term assets. Capital budgeting is primarily concerned with sizable investments in long-term assets which may be tangible or intangible assets. Purchase of new machines, introduction of new products, and modernization of facilities are viewed as tangible. Introduction of new technology, patents and trademarks are known as intangible assets. In addition to this, investments in processes such as research, design, development, and testing for development of new product or technology are also viewed as intangibles assets.

Irrespective of investments in tangible or intangible assets, capital budgeting proposal can be distinguished from regular expenditure by two features namely long term nature and huge investments. These characteristics have a long-range impact on the firm's performance and they are critical to the firm's success or failure. You have to explore and identify the potentially lucrative investment opportunities and proposals and select the best one as the selected option affects the value of the firm (shareholders wealth). This chapter deals with the art of making right capital budgeting decisions.

3.1 Learning Objectives

After reading this chapter you will be able to:

1. Understand the meaning of capital budgeting
2. Understand the process of capital budgeting
3. Explain the importance of capital budgeting decisions
4. Understand the types of proposals
5. Estimate the cash flows

3.2 Meaning and Definition of capital budgeting

I hope that you can remember very well what we have discussed in the first chapter. As a finance manager, you have to make four major decisions for your organization namely, Investment decisions, Financing decisions, Dividend decisions, and Liquidity decisions. Among these, capital budgeting decisions are most important decisions. Here the term capital refers to the amount invested in fixed assets which are used for production while budget is a plan

that contain the details about projected cash flows during the expected life of the asset or proposal period. You have to make a good decision. For this, you have to choose investments with satisfactory cash flows and rates of return. Based on the comparison of the value of expected benefits with the costs, you can decide whether an investment is worth undertaking and be able to choose intelligently the right one between two or more alternatives. To do this, a sound procedure to evaluate, compare, and select the projects is needed. This procedure is called **capital budgeting**. It is also called “Investment decision making” “Capital Expenditure decision”, “Planning capital Expenditure”. Capital Budgeting process starts with the recognition that a good investment opportunity exists in the business environment. For example: a car manufacturer is considering investment in a new plant; a pharmaceutical firm is evaluating a major R&D programme and a domestic firm is considering going for internationalization strategy.

All these decisions are based on the opportunities prevailing in the operating environment of the above stated companies i.e car manufacturer establishes a new plant because of the existing additional market potential for cars manufactured by the company; a pharmaceutical firm invests in R&D because there is an opportunity to come out with a new product which seems to do its competitors’ performance; similarly a domestic firm goes for international markets because of the prevailing opportunity to sell its product services. All these situations involve capital expenditures/ investment decisions. Based on the above discussion, we can define “Capital budgeting as the firm’s decision to invest its current funds most efficiently in the long-term assets in anticipation of the expected flow of benefits over a series of years”.

“Capital Budgeting is the firm’s process in the acquisition and investment of capital”

- **Hampton, John J**

Capital Budgeting is long-term planning in making & financing proposed capital outlays”

- **Charles. T.Hornegnes**

3.3 Nature and Forms of Investment Decisions

From the above discussion, you must be clear about the distinctive features of capital investments. However, it is important to understand separate, where has been given below :

- They have long-term consequences i.e. investments are made in the present period for achieving future benefits
- They often involve substantial and huge outlays
- They may be difficult or expensive to reverse
- The future benefits are spread over several years.

Now you know the nature of investment decisions, let us discuss the various forms of investment decisions:

1. **Replacement projects:** The objective of replacement investments is to reduce costs, increase yield, and improve quality, in turn, improving operating efficiency. Usually company replaces the obsolete and inefficient equipments by the new ones.
2. **Expansion projects:** These investments are meant to increase capacity and/ or widen the distribution network in the same line of product. For example, you are in the business manufacturing chemicals and you have a plant in Chennai and you have decided to establish one more unit at Delhi or some other place or moving international market. These kind of investments are more riskier and complex than the replacement projects and require more careful analysis. Usually these decisions are taken by the top management as they affect the future of the organization.
3. **Diversification projects:** These investments are meant to produce new products or services (not related to the existing) or entering into entirely new geographical areas. Considering the above example, now you are moving into steel or other products. Often diversification projects entail substantial risks, involve huge outlays, and require considerable managerial efforts and attention. Given their strategic importance, such projects call for a very thorough evaluation, both quantitative and qualitative. Further, they require a significant involvement of the board of directors (top management).
4. **Research and development projects:** Traditionally, R&D projects absorbed a very small proportion of capital budget in most Indian companies. Things however are changing now. Companies are now allocating more funds to R&D projects, more so in knowledge intensive industries. R&D projects are characterized by numerous uncertainties and typically involve sequential decision-making. Hence the standard DCF analysis is not applicable to them. Such projects are decided on the basis of managerial judgment. Firms, which rely more on quantitative methods, use decision tree analysis and option analysis to evaluate R&D projects.
5. **Mandatory investments:** These are expenditures required to comply with the statutory requirements. e.g., pollution control equipment, medical dispensary, firefighting equipment etc. These are often non-revenue producing investments.

So far we have discussed about the meaning, nature and the various forms of capital budgeting decisions. Now, Can you tell why capital budgeting decisions are deemed important?

3.4 Importance of Capital Budgeting

As we have discussed above, Capital Budgeting is an extremely important aspect of a firm's financial management. The following are some of the special reasons for its importance:

- 1. Long term implication for the firm's growth:** Capital budgeting decisions have a substantial influence on the future profitability and survival of the company. It has a decisive influence on the rate and direction of its growth. A wrong decision can prove disastrous for the continued survival of the organization. Unwanted or unprofitable expansion of assets will result in heavy operating costs to the firm. On the other hand, inadequate investment in assets would make it difficult for the company to complete successfully and maintain its market share.
- 2. It affects the risk profile of the firm:** The long-term commitment of funds may also change the risk profile of the company. If the adoption of investment increases average gain but simultaneously causes frequent fluctuations in its earnings, the firm will become more risky. Therefore, it needs serious considerations in making these decisions.
- 3. It involves huge investments:** Generally these decisions involve large amount of funds that makes it imperative for the company to plan its investment programmes very carefully, reviewed properly and make an advance arrangement for procuring finances either internally or externally.
- 4. Irreversible Decisions:** Most investment decisions are irreversible as they involve large sum of money. It is very difficult to reverse without causing substantial loss, because it is often difficult to find a market for such capital items once they have been acquired. The firm will incur heavy losses if such assets are scrapped (if investments are dropped in the middle).
- 5. It is most difficult decision to make:** Investments decisions are the most complex ones as they involve consideration of multiplicity of factors. Decisions are made based on the future events, which are difficult to predict exactly. It is really a complex problem to accurately estimate the future cash flows of an investment.

Economic, social, & technological forces cause the uncertainty in the cash flows pertaining to the future.

- 6. It affects company's future cost-structure:** As discussed above, these decisions involve large sum of money. The sizable amount is invested in fixed costs in labour, salary, rent of building and so on. If the investment turns out to be unsuccessful, the company has to bear the burden of fixed costs until the assets are completely written off.

Now let us move on to the phases of capital budgeting process.

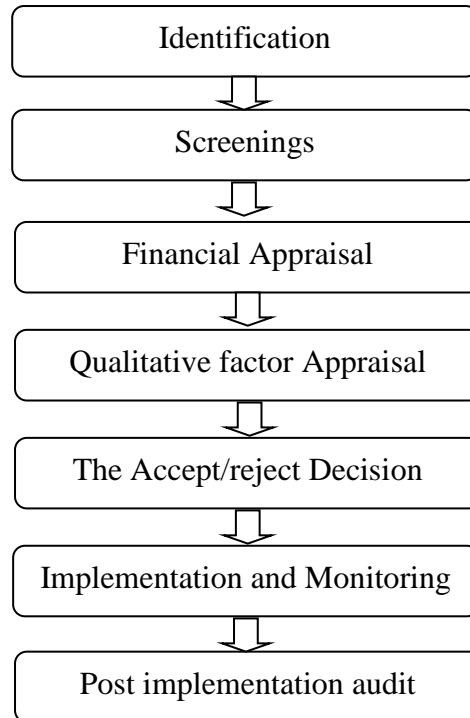
Test of Understanding - 1

1. What is capital budgeting?
2. Write any two features of investment decisions.
3. Give two examples for tangible and intangible assets.
4. Can you describe about mandatory investments? Yes/ No
5. Can you tell why capital budgeting decisions are deemed important? Yes/ No

3.5 Process or Steps Involved In Capital Budgeting

Capital budgeting decision making process is a multi-faceted activity. It refers to the total process of generating, evaluating, selecting and following up on expenditure alternatives. In capital budgeting literature, capital budgeting decision making process can bifurcated into two: Normative approach and process approach. The normative approach, which represents traditional capital budgeting theory, presents the rule of how firms should treat investment decisions. The main emphasis is generally put on the financial evaluation and selection of proposed investments in long-term assets. In contrast to the normative approach, the process approach has a broader perspective and tries to explain and describe the whole process by which projects become identified, developed, justified and finally approved. Most models describing the capital budgeting processes are based on extensive case studies, and literature on the subject therefore tends to be strongly empirical oriented. Academics have however, also tried to analyse how firms could improve their investment processes, why it is difficult to make a clear distinction between descriptive statement and normative views. In the following section an introduction to the process oriented view is discussed.

Figure 3.1
Capital Budgeting Process



Let we discuss one by one.

1. **Identification of potential investment opportunities:** Identification of opportunities and generation of investment project proposals is an important step in the capital budgeting decisions. To get an idea, you have to monitor the external environment and internal environment. The identified opportunities need to have a fit with the corporate goals and strategy. Sometimes, you may find that adoption of a good investment opportunity might have changed your organization's strategy itself. Therefore, you have to be very careful while identifying the proposals as there is a two-way traffic between strategy and opportunities.
2. **Preliminary Screening of proposals:** you may have many potential proposals. Obviously, you may go for thorough analysis for all the opportunities which is subjected to preliminary screening process to reject the unsound proposals. For this, you may employ some preliminary quantitative analysis and judgments based on intuitive feelings and experience. After evaluating the profitability of various proposals, if a proposal satisfies the screening process, it is moved to the next stage.

3. **Financial Appraisal of Proposals:** After passing from the preliminary screening stage, the selected idea is subjected to rigorous analyses to make the right decisions. If a proposal satisfies the screening process, it is then analyzed in more detail by gathering technical, marketing, economic and other data. Cash flow is the basic input for quantitative analysis. Cash flow forecasting is a critical component of the capital budgeting process. Poor forecasts will result in poor decisions irrespective of the model being used. You can use both the quantitative and qualitative cash flow forecasting methods; the former includes marketing research, benchmarking, engineering cost studies, among others. Given a high degree of uncertainty in their environment, corporations need to use methods to manipulate and evaluate cash flow forecasts with respect to their risk characteristics.

The management of a company should devote considerable time, effort and money in obtaining correct estimates of cash flows. You prepare the cash flow estimates on the basis of the information generated from various sources. It is your responsibility to check such information for their relevance and accuracy. You may use both the quantitative methods (viz. sensitivity analysis, computer simulation, sophisticated mathematical modelling and probability theory) and qualitative methods (viz. management's subjective estimates and the consensus of experts' opinions) in the estimation of cash flows. After identifying the cash flows, you have to apply the financial appraisal techniques to calculate the net present value of the proposals. There are several techniques available to assist a firm in evaluating its capital budgeting project. We are going to discuss about the techniques with more detail in the next chapter.

4. **Qualitative factors in Project Evaluation:** After passing through the quantitative analyses, you have to test further taking into consideration of qualitative factors. This is very difficult to measure monitorly and evaluate accurately. However you have to consider and evaluate the following qualitative factors:
- a. The societal impact of an increase or decrease in employee numbers
 - b. Environmental impact of the proposal
 - c. Attitudes of government towards the proposal
 - d. Relationships (positive or negative) with trade unions about the proposal
 - e. Legal difficulties with respect to the use of patents, copyrights and trade names

You have to address the above issues during your proposal analysis fairing which they affect the value of the firm. And you have to discuss with various parties to make the appropriate adjustment in your proposal if need arises.

5. **The Accept/reject Decision:** Here investments proposals are usually classified into various categories in facilitating decision-making, budgeting & control. For example, products or expansion or improvement or diversification and ranked within each classification based on profitability, risk and degree of urgency. The accepted proposals i.e. profitable proposals are put in priority. It may not be possible for the firm to invest immediately in all the acceptable proposals. Thus, it is essential to rank the various proposals. Recommended Proposals are sent to the top management along with a detailed report containing information about the capital expenditures and the proposed sources of capital. You will present several alternative capital expenditure budgets. When capital expenditure proposals are finally selected, funds are allocated for them.
6. **Project implementation and monitoring:** Once the proposals have passed the decision stage, it must be implemented at the earliest. During the implementation stage various divisions of the company are involved. Therefore it is required to monitor constantly and remove the bottlenecks if any.
7. **Post implementation audit:** Last but not the least important step in the capital budgeting process is an evaluation of performance of the project, after it has been fully implemented. It is the duty of the top management or executive committee to ensure that funds are spent in accordance with the allocation made in the capital budget. A control over such capital expenditure is very much essential and for that purpose a monthly report showing the amount allocated, amount spent, approved but not spent should be prepared and submitted to the controller. The evaluation is made through post completion audit by way of comparison of actual expenditure on project with the budgeted one, and also by comparing the actual return from the investment with the anticipated return. The unfavorable variances, if any, should be looked into and the causes of the same be identified so that corrective action may be taken in future.

I hope that all the seven steps discussed above are clear to you and you would have understood the meaning & importance of all of them. Among these, the evaluation of project is the most important point for you as a student of

management but before we do that it is important for you to understand certain basic issues related to capital budgeting.

Test of understanding - 2

1. List out steps involved in capital budgeting process.

2. Identify any two minimum qualitative factors that are considered in capital budgeting in automotive industry.

3. In what way the post implementation audit will help a company in its capital budgeting exercise?

3.6 Basics or issues of Capital budgeting Decisions

1. **Differing project life cycles:** Normally the best project is selected based on the decision criterion. If the alternative projects have same size then there is no problem. If the projects have different size, you should calculate annual equivalent value (AEV) of cash flows of each project and proceed further.
2. **Capital rationing:** Most of the firms specify a periodic limit on the overall budget for capital spending. There may be good proposals which are taken up for implementation due to financial constraints (the limited funds allocated for the year). Capital rationing is concerned with the problem of selecting the mix of acceptable projects. Before moving to quantitative analysis, clearing this situation will save the valuable time of the committee.
3. **Accept – Reject Vs Ranking Approach:** While evaluating the project, you should be clear with the selection procedures. There are two approaches. Selection of the project which is based on firm's minimum accept criterion is known as accept-reject approach. It is suitable for the firm which has unlimited funds. On the other hand, based on some resources constraints and predetermined measures, if the projects are selected, then it is known as ranking approach. This is more suitable for mutually

exclusive projects (selection of one leads to rejection of the other project).

4. **Conventional Vs Non- Conventional Cash Flow:** For evaluating the capital budgeting decisions; you require information about cash flows-inflows as well as outflows. In the capital budgeting procedure, estimating the cash flows is the first step which requires the estimation of cost and benefits of different proposals being considered for decision-making. This can be classified into two: conventional and non-conventional pattern. A project which has initial cash outflow and followed by series of inflows is called project with conventional cash flows. For example, a project costs Rs. 10,0000 and yields annual cash inflow of Rs.30,000 for 5 years. On the other hand, a project which has initial cash outflow and followed by series of inflows and outflows, then it is called a project with non-conventional cash flows. For example, a project costs Rs. 1,00,000 and yields annual cash inflow of Rs.30,000 for 5 years. In the fourth year it requires additional working capital of Rs.25,000 to complete the projects successfully.
5. **Annuity Vs Mixed Stream:** Annuity is a stream of equal annual cash flows. A series of cash flows exhibiting any pattern other than that of an annuity is a mixed stream of cash flows.
6. **Determining Discount rate:** The discount rate has become one of the central concepts of finance. Some of its manifestations include familiar concepts such as opportunity cost, capital cost, borrowing rate, lending rate and the rate of return on stocks or bonds. It is greatly influences the computation of Net Present Value (NPV). The selection of proper discount rate is critical in making correct decisions. In order to compute the net present value, it is necessary to discount future benefits and costs. Please do remember the previous chapter (cost of capital).
7. **Independent proposals:** If there is no relationship between two projects or one and the other proposals, then they are known as independent projects. Hence, selection of one project (say X) does not affect the selection or rejection of other projects (say Y,Z) of the firm provided projects X, Y, and Z are independent projects.
8. **Dependent proposals or contingent proposal:** When a proposal depends on the acceptance/rejection of some other

Proposal, it is called a dependent proposal. Example: Purchasing a specific printer depends on the proposal to acquire a Computer.

9. **Mutually exclusive proposal:** If acceptance of one proposal results in the automatic rejection of the other proposal, it is called as mutually exclusive proposals. Example: Two different brands of machine performing the same task.

Let us discuss the important factors influencing the capital budgeting decisions :

3.7 Factors Influencing Capital Expenditure Decision

The following factors (both financial & non-financial) influence the capital expenditure decision.

1. **Availability of funds:** This is the crucial factor affecting the capital expenditure decision. Many projects are dropped due to financial constraints.
2. **Future earnings:** Every project has to produce cash inflows in future. It's varied of each project & anticipated revenue's. This is the most significant factor, which affects the choice of a project.
3. **Legal compulsion:** When the statutory compulsion arises, cost & benefits consideration have to be ignored (Ex: - Disposal of waste). The industry should provide the safety measures according to the Factories Act, automobile industry need to follow euro emission norms.
4. **Degree of uncertainty or risk:** The level of risk involved in a project is not predictable one.
5. **Urgency:** Projects, which are to be immediately taken up for a firm's survival, have to be treated differently from optional projects.
6. **Research & development projects:** Technology based industry need R&D investments for obtaining competitive edge in the industry.
7. **Obsolescence:** If obsolete machines and plant exist in a firm, then their replacement becomes a compulsion.
8. **Competitor's activities:** When competitors perform certain activities, they may compel the company to undertake similar activities for its survival in the field.
9. **Integral factors:** Firm's prestige, worker safety, social welfare etc influence the capital expenditure of a firm, which may be deemed as emotional factors.

Test of understanding

1. Can you recall the basic issues of capital budgeting? Yes/ No
 2. List out any four factors influencing your capital budgeting.
-
-

3.8 Motive behind the Capital Budgeting Decisions

It can be divided into two categories based on the benefit expected from the expenditure.

1. **Capital expenditure, which increases revenue:** It is the expenditure, which gives additional income.

Ex: It is necessary to purchase the assets, which are required for producing the new product or expansion of existing production facilities etc. In this case the risk is higher because the firm has to enter into new activities.

2. **Capital Expenditure which reduces costs:** It is the expenditure which reduces the cost of present product/process/operation and thereby it increases the profitability of the company. In this case risk is less because the firm is already in the line of known operation.

What do you think should be the characteristics of a Sound Investment Evaluation Criterion? Let us discuss.

3.9 Characteristics of a Sound Investment Evaluation

The following are the important characteristics of a sound investment evaluation criterion:

- a. It should provide the means of distinguishing between acceptable and non-acceptable projects.
- b. It should provide clear-cut ranking of the projects in order of the profitability or desirability.
- c. It should also solve the problem of choosing among alternative projects.
- d. It should be a criterion, which is applicable to any conceivable investment project
- e. It should emphasize upon early and bigger cash benefits in comparison to distant and smaller benefits.
- f. The method should be suitable according to the nature and size of capital project to be evaluated.

For evaluating the project you need data which is basically about the cash flows- inflows as well as outflows. Your understanding of cash flows needs to be very clear, before you start with the evaluation.

3.10 Estimation of Project Cash Flows

As mentioned above, estimating the cash flows is the first step which requires the estimation of cost and benefits of different proposals being considered for decision-making. Usually, two alternatives are suggested for measuring the 'Cost and benefits of a proposal *i.e.*, the accounting profits and the cash flows. In reality, estimating the cash flows is the most important as well as difficult task. It is because of the uncertainty and accounting ambiguity. Accounting profit is the resultant figure on the basis of several accounting concepts and policies. Adequate care should be taken while adjusting the accounting data, otherwise errors would arise in estimating cash flows. The term cash flow is used to describe the cash oriented measures of return, generated by a proposal. Though it may not be possible to obtain exact cash-effect measurement, it is possible to generate useful approximations based on available accounting data. The costs are denoted as cash outflows whereas the benefits are denoted as cash inflows. The relationship between cash flows and Accounting Profit is discussed in the subsequent Para.

Cash flow Vs Accounting Profit: The evaluation of any capital investment proposal is based on the future benefits accruing from the investment proposal. For this, two alternative criteria are available to quantify the benefits namely, Accounting Profit and Cash flows. The basic difference between them is primarily due to the inclusion of certain non-cash items like depreciation. This is illustrated in the Table 3.1:

Table 3.1

A comparison of cash flow and accounting profit approaches

| Accounting Approach | | | Cash flow Approach | | |
|---------------------|-----|------|---------------------|-----|------|
| Particulars | Rs. | Rs. | Particulars | Rs. | Rs. |
| Revenue | | 1000 | Revenue | | 1000 |
| Less: Expenses | | | Less: Expenses | | |
| Cash Expenses | 400 | | Cash Expenses | 400 | |
| Depreciation | 200 | 600 | Depreciation | 200 | 600 |
| Earnings before Tax | | 400 | Earnings before Tax | | 400 |
| Tax @ 50% | | 200 | Tax @ 50% | | 200 |

| | | | | | |
|--------------------|--|-----|--------------------|--|-----|
| Earnings after Tax | | 200 | Earnings after Tax | | 200 |
| | | | Add: Depreciation | | 200 |
| | | | Cash flow | | 400 |

On the basis of this example, the cash flow may be stated as follows:

$$\text{Cash flow} = \text{Profit after Tax (PAT)} + \text{Non cash expenses}$$

Further, if the firm has spent Rs. 50 on capital expenditure then this will not affect the profit figure but Rs. 50 will reduce the cash flow as follows:

$$\text{Cash flow} = \text{PAT} + \text{Nm-Cash expenditure} - \text{Capital Expenditures}$$

Impact of inflation: In practice, you do recognize that inflation exists but rarely incorporate inflation in the analysis of capital budgeting, because it is assumed that with inflation, both net revenues and the project cost will rise proportionately, therefore it will not have much impact. However, this is not true; inflation influences two aspects viz. Cash Flow, Discount Rate. Capital budgeting results would be unrealistic if the effects of inflation are not correctly factored in the analysis.

3.11 Summary

Making capital budgeting decisions are among the most important and multifaceted of all management decisions as it represents major commitments of company's resources and have serious consequences on the profitability and financial stability of a company. It is important to evaluate the proposals rationally with respect to both the economic feasibility of individual projects and the relative net benefits of alternative and mutually exclusive projects. Capital budgeting decision begins with the identification of investment opportunities followed by preliminary screening, financial appraisal, qualitative factors, accept or reject decision, implementation and monitoring and ends with the performance review. For evaluating the project you need data which is basically the cash flows- inflows as well as outflows. Your understanding of cash flows needs to be very clear.

3.12 Self Assessment Questions

1. What is the definition of cash flow? How does this differ from the accounting approach?
2. Explain why net cash flows after tax is considered for decision making.
3. Examine the need and significance of capital budgeting.
4. Briefly describe each of the steps involved in the capital budgeting process.
5. Discuss the various factors influencing capital budgeting decision of a firm.
6. Write short notes on 'capital rationing'.
7. Define inflation. Discuss how the inflation affects the cash flows of a project?
8. State the characteristics of a sound investment evaluation.
9. What do you mean by real rate of return?

3.13 References and Further Readings

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NOTES

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Chapter - 4
CAPITAL BUDGETING TECHNIQUES

4.0 Introduction

4.1 Learning Objectives

4.2 Non-discounted cash flow Method

4.2.1 Payback Period

4.2.2 Accounting Rate of Return (ARR)

4.3 Discounted Cash flow Method

4.3.1 Net Present Value (NPV)

4.3.2 Internal Rate of Return (IRR)

4.3.3 Profitability Index (PI)

4.4 Financial Planning for a new Business

4.5 Summary

4.6 Self Assessment Questions/Problems

4.7 References and Further Readings

4.8 Answer for test of understanding

4.0 Introduction

Several techniques are available to assist a firm in evaluating a capital budgeting project. There are five most commonly used capital budgeting techniques which are employed in evaluating an investment project. The Net Present Value (NPV) and Internal Rate of Return (IRR) methods are considered to be discounted cash flow (DCF) methods. The Payback Period (PB) and Average Accounting Rate of Return (ARR) methods are classified under non-DCF methods. From a pure theoretical point of view the NPV is considered to be the most accurate technique to evaluate projects. Yet, it is also the most sophisticated of the five, followed by the IRR method. Both the non-DCF methods are considered to be less accurate, of which the PB method is the least sophisticated. The use of a particular financial appraisal technique influences heavily the selection of the proposal. Therefore, you have to devote considerable time and effort in understanding the relative merits and demerits of these methods.

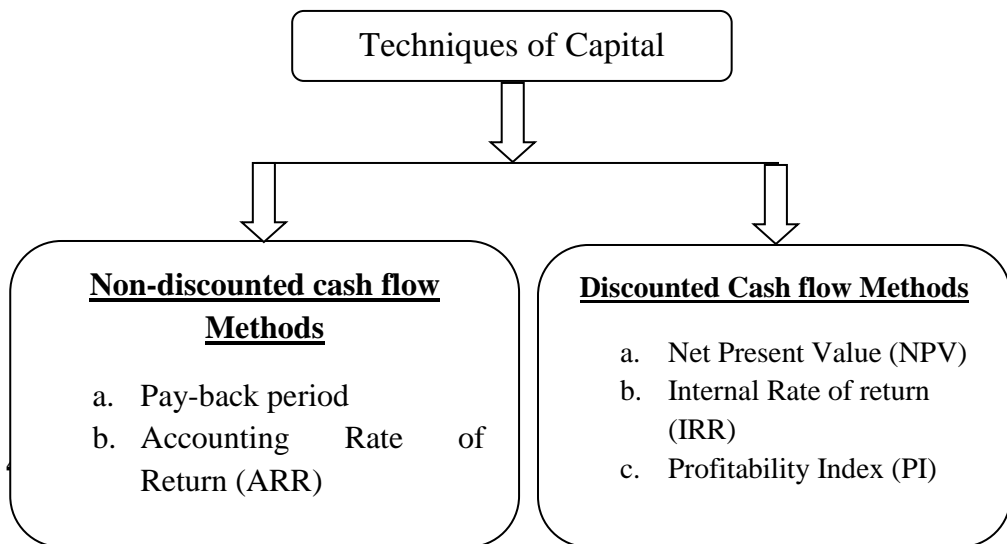
This stage is an important stage for you in deciding whether to accept or reject a specific proposal. You may have variety of good proposals, but you should allocate the resources among the competing uses which require a decision rule. Decision rule refers the tool which is used as a selection criteria or yardstick to decide the proposals which are worth pursuing from among those that are not. The decision rule chosen to evaluate a proposal is significant for many reasons, the primary one being that it is a reflection of the objective function chosen by you. Generally, the proposals should be evaluated in terms of their economic worth to the company which can be measured in terms of cost and benefits of the proposals. It has already been discussed about the cost and benefits of proposals which are measured in terms of Cash flows generated by them. The choice of capital budgeting techniques is a key issue and can also be influenced by the degree of sophistication. Following are some of the features, which a capital budgeting evaluation technique should possess:

- All the cash flows should be considered.
- The technique should also consider the time value of money i.e. the cash flows arising at different point of time must be differentiated in respect of their worth to the company.
- It should be objective and unambiguous in its approach. There should not be any scope for subjectivity of the decision maker.
- The last but not the least, the technique must be in line with the firm's objective of maximization of shareholders wealth.

Now, you know that it is very important to evaluate the proposals. Let us discuss the techniques of evaluation.

A number of investment tools are used in practice. It can be grouped into two categories:

Figure 4.1
Classification of Capital Budgeting Techniques



After going through this chapter, you should be able to:

1. Understand the non-discounted cash flow methods of project evaluation and selection
2. Understand the discounted cash flow methods of project evaluation and selection
3. Explain the computation, acceptance criterion and pros and cons of these different methods

4.2 Traditional or Non-Discounted Techniques

A non-discount method of capital budgeting does not explicitly consider the time value of money. In other words, each rupee earned in the future is assumed to have the same value as each rupee that was invested in the past. There are two such techniques available namely

- a. The Payback period method, and
- b. The Accounting rate of return method.

4.2.1 Pay-back period method

The *payback method* is one of the techniques used in capital budgeting that does not consider the time value of money. The payback method simply calculates the number of years it will take for an investment to return cash equal to the amount invested in a project.

Decision Criterion: When two or more projects are considered, the rule for making a selection decision is as follows:

- Choose the project with the shorter payback period.
- The rationale behind this is that the shorter the payback period, the greater the liquidity, the less riskier the project.

Computation of the Payback period: The payback period can be calculated in two different situations as follows:

- A. ***When cash flows are uniform:*** If you are getting cash inflows at a uniform rate during the investment horizon, the payback period can be computed by dividing the cash outflow by the annual cash inflow. Thus,

$$\text{PBP} = \frac{\text{Initial investment/original cost of the assets}}{\text{Annual cash inflow}}$$

For example, you have a proposal which requires a cash outflow of Rs. 18,000 and is expected to generate cash inflows of Rs. 6,000 a year for 5 years. In this case, the payback period of your proposal is 3 years i.e., $\text{Rs. } 18,000 / \text{Rs. } 6,000 = 3 \text{ years}$.

- B. ***When cash flows are not uniform:*** If your investments are not getting the cash inflows at a uniform rate, the payback period can be determined by adopting the following procedure:
- a. Find out the cash inflows after tax but before depreciation
 - b. Calculated the cumulative cash inflow (after tax but before depreciation)
 - c. Find the cash inflow equal to your investment

Considering the above example, assume that the cash inflows are Rs. 4000 in the first year, Rs. 5000 in the second year, Rs. 6000 in the third year, Rs. 6000 in the fourth year, and Rs. 8000 in the fifth year. The payback period would be 3.5 years. In three years, Rs. 15,000 ($4,000 + 5,000 + 6,000$) has been recovered. And it takes half year ($\text{Rs. } 3,000 / \text{Rs. } 6,000$) to recover the balance. Hence, the payback period is 3.5 years.

So far we have discussed how to compute the payback period for one proposal. If you have two or more proposals, how to compute the payback period? Let us discuss now.

Example 4.1

A company is considering two projects X & Y. Following are the particulars in respect of them.

| | X | Y |
|------------------------------|----------|----------|
| Cost(Rs) | 1,40,000 | 1,40,000 |
| Economic life of the assets | 10 | 10 |
| Annual saving cash flow (Rs) | 25,000 | 20,000 |

Ignore income tax. Recommend the best of these projects using Pay Back Period.

Solution:

$$\text{Pay Back Period} = \frac{\text{Initial investment}}{\text{Annual cash inflow}}$$

| | | |
|--|-----------|-----------|
| | =1,40,000 | =1,40,000 |
| | 25,000 | 20,000 |
| | =5.6 Yrs | 7 Yrs |

Payback period of project X is less than PBP of Y. Hence, project x is more desirable as compared to project y.

Example 4.2

A company is considering two projects A & B. Following are the particulars in respect of them

| | A | B |
|--------------------------|---------|--------|
| Cost of the project (Rs) | 150000 | 140000 |
| Life of the project | 5 | 5 |
| Cash inflow | | |
| | 1 50000 | 70000 |
| | 2 50000 | 30000 |
| | 3 50000 | 20000 |
| | 4 50000 | 20000 |
| | 5 50000 | 110000 |

Ignoring income tax, recommend the best of these projects using PBP.

Solution:

$$\text{Project A} = \frac{\text{Initial investment}}{\text{Annual cash inflow}} = \frac{1,50,000}{50,000} = 3 \text{ Yrs}$$

Project B

| Year | Cash inflow* | cumulative |
|------|--------------|------------|
| 1 | 70000 | 70000 |
| 2 | 30000 | 100000 |

| | | |
|---|--------|--------|
| 3 | 20000 | 120000 |
| 4 | 20000 | 140000 |
| 5 | 110000 | 250000 |

* After tax but before depreciation.

→ upto fourth year, Rs 1,40,000 recovered.

→ the rest of the Rs 10,000, we have to recover from the fifth year.

How many days/month it will take? We can find out by the following way

$$= \frac{\text{Difference of amount}}{\text{Annual cash inflow of the recovered year}} \times \text{months}$$

$$= \frac{10,000}{1,10,000} \times 12 = 1.091 \text{ i.e. 1 month}$$

→ If you want to find out the exact days also

$$= .091 \times 30 = 3 \text{ days}$$

Therefore, 4 years 1 month 3 days

Payback period of A is less than PBP B. Hence project A is more desirable.

Advantages of Payback method

1. It is simple to understand & easy to workout.
2. It saves cost, it requires lesser time & Labour as compared to other methods of capital budgeting.
3. It reduces the possibility of loss on account of obsolescence as the method prefers investment in projects with shorter payback period.
4. Due to its short term approach, this method is particularly suited to a firm which has shortage of cash or where liquidity position is not particularly good.

Disadvantages of payback method

1. It doesn't take into account the cash inflow earned after the payback period & hence the true profitability of the project cannot be correctly assessed.
2. It ignores time value of money & doesn't consider the magnitude & Time of cash inflow. It treats all cash inflow as equal though they occur in different periods. It ignores the fact that cash received today is more important than the same amount of cash received after the period.

3. It doesn't take into consideration the cost of capital, which is very important; factor in making sound investment decision.
4. It may be difficult to determine the minimum acceptable payback Period; It is usually a subjective decision.
5. It treats each asset individually in isolation with other assets which is not feasible in real practice.
6. It is a measure of the projects capital recovery and not profitability.

Test of Understanding -1

1. List out any three disadvantages of payback method.

2. A project cost Rs.500,000 and earns annually a profit of Rs.80,000 after depreciation at 12% per annum but before tax of 50%. Calculate payback period.

3. You have to choose one of the following two mutually exclusive projects. Investment required for each project is Rs.15000. Both the projects have to be depreciated on straight line basis. The tax rate is 50%.

| Year | | 1 | 2 | 3 | 4 | 5 |
|----------------------------|-----------|------|------|------|------|-------|
| Profit before depreciation | Project A | 4200 | 4800 | 7000 | 7000 | 2000 |
| | Project B | 4200 | 4500 | 4000 | 5000 | 10000 |

Calculate payback period.

4.2.2 Accounting rate of return method

This method is also known as unadjusted rate of returns. It is calculated based on the profit rather than cash inflows. The investment inflows are totaled and the investment costs are deducted to derive the amount of profit. To estimate an annual rate of return, profit is divided by the investment period, then by the initial investment. Sometimes the *average* investment rather than the original initial investment is used as the required investment, which is called *average rate of return*. Hence,

$$ARR = \text{Average annual profit(after tax \& depreciation)} \times 100$$

Net investment in the project

Or

$$(b) \quad \frac{\text{Annual average income (ATAD)} \times 100}{\text{Average investment}}$$

$$\text{Average investment} = \text{Total investment} / 2$$

For example, you have the following information:

| | |
|----------------------------|----------|
| Initial Investment | Rs. 6500 |
| Estimated Life | 20 years |
| Expected annual net income | Rs. 675 |

How to calculate the ARR?

The simple rate of return is $[\text{Rs. } 675 / \text{Rs. } 6500] \times 100 = 10.4\%$. Using the average investment, which is usually assumed to be one-half of the original investment, the average rate of return will be doubled as follows:

$$\frac{\text{Rs. } 675}{\text{Rs. } 6500/2} = \frac{\text{Rs. } 675}{\text{Rs. } 3250} \times 100 = 20.8\%$$

Decision Criterion: You have to select the project, which generates the highest rate of return, and others are ruled out (i.e., projects with lower rate of returns are rejected).

Computation of ARR

Example 4.3

A company is considering investing in a project requiring a capital outlay of Rs.200,000. Forecast for annual income after depreciation but before tax is as follows:

| Year | 1 | 2 | 3 | 4 | 5 |
|---------------|---------|---------|--------|--------|--------|
| Amount in Rs. | 100,000 | 100,000 | 80,000 | 80,000 | 40,000 |

Depreciation may be taken as 20 per cent on original cost and taxation at 50 per cent of net come. You are required to evaluate the project according to:

- Rate of return on original investment method
- Rate of return on average investment method

Solution

| Year [1] | Annual Income (ADBT) [2] | Tax [3] = [2] x 50% | Annual Income (ADAT) [4] = [2] - [3] |
|-------------|-----------------------------|------------------------|---|
| 1 | 100,000 | 50,000 | 50,000 |
| 2 | 100,000 | 50,000 | 50,000 |
| 3 | 80,000 | 40,000 | 40,000 |
| 4 | 80,000 | 40,000 | 40,000 |
| 5 | 40,000 | 20,000 | 20,000 |
| Total | | | 200,000 |

ARR (on original Investment) = $[200,000 \div 5] \div 200,000 \times 100 = 20\%$

ARR (on average Investment) = $[200,000 \div 5] \div 100,000 \times 100 = 40\%$

Advantages of ARR

1. It is very simple to understand & easy to operate .
2. It uses the entire earning of project in calculating the rate of return.
3. As this method is based upon accounting concept of profit, it can be readily calculated from the financial data.

Disadvantages of ARR

1. It ignores the time value of money.
2. It ignores the fact that the rupee earned today is more valuable than a rupee earned a year after.
3. It doesn't take into consideration the cash flows that are more important than the accounting profit.
4. It ignores the period in which the profits are earned.

From the above discussion on the traditional methods of evaluation, you can be clear that these techniques (both the PB and ARR) fail to be sound and efficient techniques, because they suffer from:

- Ignoring the time value of money and
- Non-consideration of total benefits emanating from a proposal.

Both these aspects are taken into account by the discounted cash flow techniques of evaluation of capital budgeting proposals. **Now we will move our discussion to discounted cash flow techniques**

Test of understanding -2

1. Can you recall the ARR formula? Yes/No
2. List out any two advantages of ARR method.

-
3. Calculate the average rate of return for projects X and Y from the following:

| Particulars | Projects | | Projected Net Income (after interest, depreciation and taxes) | | |
|---------------------------------|---------------|---------------|---|-----------|-----------|
| | X | Y | Year | Project X | Project Y |
| Investments Expected life | Rs. 20,000 | Rs. 30,000 | 1 | Rs. 2000 | Rs.3000 |
| | | | 2 | Rs. 1500 | Rs.3000 |
| | 4 years | 5 years | 3 | Rs. 1500 | Rs.2000 |
| | | | 4 | Rs. 1000 | Rs.1000 |
| | | | 5 | -Nil | Rs. 1000 |

If the required rate of return is 12%, which project should be undertaken?

4.3 Discounted cash flow (DCF) method

DCF methods have been recognized as the most sophisticated techniques, because it overcomes the drawbacks of non-discounted techniques. It is an important criterion in evaluating investment proposals.

4.3.1 Net present value method

The NPV is the first and the foremost of the discounted cash flow techniques. The **net present value** (NPV) of a proposal is defined as “the present value of all future cash flows produced by an investment, less the initial cost of the investment.” If the NPV is positive, you have to choose the proposal based on the organization strategy. If all the available proposals NPV’s are positive, you may choose all the proposals. On the other hand, if you have limited resources, you should rank the proposals in the descending order and select the best among the proposal with highest NPVs.

The NPV Decision rule: In determining whether to accept or reject a particular projected, the NPV decision rule is

- **Accept** a project if its $NPV > 0$;
- **Reject** a project if its $NPV < 0$;
- **Indifferent** where $NPV = 0$.

NPV Computations

Example 4.4

Your net investment is of Rs.40, 000 and the company's cost of capital is 5%. Net Cash Flows for year one is Rs.25,000, for year two is Rs.36,000 and for year three is Rs.5000. What would the net present value this a project?

Solution:

1. Since there is no information about annual before or after depreciation and tax cash flow, you may assume that the given income is cash flow after tax but before depreciation (CFATBD).
2. The present value of Re 1 due in any number of years can be found with the use of the following mathematical formula.

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

Where PV=present value r=rate of interest/discount

| Year [1] | CFATBD [2] | Discount rate @ 5% [3] | Discounted cash flow or Present value [4] = [2] x [3] |
|---|---------------|------------------------------|--|
| 1 | 25,000 | 0.952 | 23,800 |
| 2 | 36,000 | 0.907 | 32,652 |
| 3 | 5,000 | 0.864 | 4,320 |
| Total Discounted cash flows or Gross present value | | | 60,772 |
| Less: Initial net investment | | | 40,000 |
| Net Present Value | | | 20,772 |

Since NPV of this project is positive, you should accept this project.

Example 4.5

The ABC Company Limited is considering the purchase of a new machine. Two alternative machines (X and Y) have been suggested each costing

Rs. 200,000. Earnings after taxation are expected to be as follows:

| Year | 1 | 2 | 3 | 4 | 5 |
|--------------------|--------|--------|---------|---------|--------|
| Amount in Rs for X | 20,000 | 60,000 | 80,000 | 120,000 | 80,000 |
| Amount in Rs for Y | 60,000 | 80,000 | 100,000 | 60,000 | 40,000 |

The company has a target return on capital of 10 % and on this basis you are required to compare the profitability of the machines and state which alternative you will consider as financially preferable.

NPV for Machine X:

| Year | CFAT | Depreciation | CFATBD | PV factor @ 10% | Present Value |
|--------------------------|---------|--------------|---------|-----------------|---------------|
| 1 | 20,000 | 40,000 | 60,000 | 0.909 | 54,540 |
| 2 | 60,000 | 40,000 | 100,000 | 0.826 | 82,600 |
| 3 | 80,000 | 40,000 | 120,000 | 0.751 | 90,120 |
| 4 | 120,000 | 40,000 | 160,000 | 0.683 | 109,280 |
| 5 | 80,000 | 40,000 | 120,000 | 0.621 | 74,520 |
| Total Present Value | | | | | 411,060 |
| Less: Initial Investment | | | | | 200,000 |
| Net Present Value | | | | | 211,060 |

Note: Depreciation is calculated under straight line method = Rs. 200,000 ÷ 5 = Rs. 40,000

Machine Y

| Year | CFAT | Depreciation | CFATBD | PV factor @ 10% | Present Value |
|--------------------------|---------|--------------|---------|-----------------|---------------|
| 1 | 60,000 | 40,000 | 100,000 | 0.909 | 90,900 |
| 2 | 80,000 | 40,000 | 120,000 | 0.826 | 99,120 |
| 3 | 100,000 | 40,000 | 140,000 | 0.751 | 105,140 |
| 4 | 60,000 | 40,000 | 100,000 | 0.683 | 68,300 |
| 5 | 40,000 | 40,000 | 80,000 | 0.621 | 49,680 |
| Total Present Value | | | | | 413,140 |
| Less: Initial Investment | | | | | 200,000 |
| Net Present Value | | | | | 213,140 |

The NPV of Machine X is less than Machine Y. Hence Machine Y is desirable.

Advantages of NPV Method

1. It considers the time value of money & is suitable in case of projects with uniform cash inflows at different period of time.

2. It takes into account the earning over the entire life of the project & true profitability of the investments proposals can be evaluated.
3. It takes into consideration of the objective of maximum profitability.

Disadvantages of NPV Method

1. It is a difficult method to understand as compared to the Traditional methods.
2. It may not give good result while comparing projects with unequal lives. (projects having higher NPV but realized in a longer life span may not be desirable compared to a project having lesser NPV achieved in much shorter span of life).
3. In the same way as the above, it may not give good results while comparing projects with unequal investment of fund.
4. It is not easy to determine the appropriate discount rate.

4.3.2 Internal rate of return (IRR)

The internal rate of return (IRR) of a project is the rate of return where the cash inflows equal the cash outflows (net investment.). In other words, Internal Rate of Return provides a simple '**hurdle rate**', whereby any project should be avoided if the cost of capital exceeds this rate. It can be mathematically calculated using the following formula:

$$CF_0 + \frac{CF_1}{(1+r)^1} + \frac{CF_2}{(1+r)^2} + \frac{CF_3}{(1+r)^3} + \frac{CF_n}{(1+r)^n} = 0$$

Where, **CF** is the Cash Flow generated in the specific period (the last period being 'n'). IRR, denoted by 'r' is to be calculated by employing trial and error method.

(1) When cash flows are uniform

$$F = \frac{I}{C} \quad \text{where } F = \text{factor to be located}$$

I = original investment
C = cash inflow per year

(2) When cash inflows are not uniform

Apply trail & error method.

Decision Criterion:

- Accept a project if $IRR > \text{cost of capital}$
- Reject a project if $IRR < \text{cost of capital}$
- Indifference if $IRR = \text{cost of capital}$
- For Mutually exclusive projects accept the project with highest IRR if $IRR > r$

Where = r is the required return on the project. We illustrate the use of the IRR rule, and some of the pitfalls of this approach via a series of examples.

Computation of IRR

Example 4.6

A company is considering an investment proposal at a cost of Rs. 50,000. The estimated cash flows from the investment proposal are as follows:

| Year | 1 | 2 | 3 | 4 | 5 |
|------|--------|--------|--------|--------|--------|
| CFAT | 10,000 | 10,450 | 11,800 | 12,250 | 16,750 |

Calculate IRR.

Solution: To find IRR you need CFATBD. But you have CFAT. Hence calculate depreciation and add to this cash flow.

Depreciation = Rs. 50,000 ÷ 5 = Rs. 10,000

| Year | CFAT | Depreciation | CFATBD | PV factor @ 10% | Present Value | PV @20% | Present Value |
|--------------------------|--------|--------------|--------|-----------------|---------------|---------|---------------|
| 1 | 10,000 | 10,000 | 20,000 | 0.870 | 17,400 | 0.833 | 16,660 |
| 2 | 10,450 | 10,000 | 20,450 | 0.756 | 15,460 | 0.694 | 14,192 |
| 3 | 11,800 | 10,000 | 21,800 | 0.658 | 14,344 | 0.578 | 14,344 |
| 4 | 12,250 | 10,000 | 22,250 | 0.572 | 12,727 | 0.482 | 10,725 |
| 5 | 16,750 | 10,000 | 26,750 | 0.497 | 13,295 | 0.402 | 10,754 |
| Total Present Value | | | | | 73,226 | | 66,675 |
| Less: Initial Investment | | | | | 50,000 | | 50,000 |
| Net Present Value | | | | | 23,226 | | 16,675 |

| Year | CFATBD | PV @25% | Present Value | PV @30% | Present Value |
|------|--------|---------|---------------|---------|---------------|
| 1 | 20,000 | 0.800 | 16,000 | 0.769 | 15,380 |
| 2 | 20,450 | 0.640 | 13,088 | 0.591 | 12,086 |

| | | | | | |
|--------------------------|--------|-------|--------|-------|--------|
| 3 | 21,800 | 0.512 | 11,162 | 0.455 | 5,079 |
| 4 | 22,250 | 0.409 | 9,100 | 0.350 | 7,788 |
| 5 | 26,750 | 0.328 | 8,774 | 0.269 | 7,196 |
| Total Present Value | | | 58,124 | | 47,529 |
| Less: Initial Investment | | | 50,000 | | 50,000 |
| Net Present Value | | | 8124 | | -2471 |

The internal rate of return is thus more than 25% but less than 30%. The exact rate may be calculated as follows:

$$IRR = r_1 - \frac{PV_1 - PV_2}{PV_3} \times r_2$$

Where r_1 = Positive NPV interest rate

PV_1 = Investment

PV_2 = r_1 's total present value (Simply $PV_1 - PV_2 = r_1$'s NPV.)

PV_3 = Positive present value minus negative present value

r_2 = difference of positive & negative discount factor.

$$r_1 = 25\% ; \quad PV_1 = \text{Rs. } 50,000$$

$$PV_2 = \text{Rs. } 58124$$

$$PV_3 = \text{Rs. } 58124 - \text{Rs. } 47529 = 10595$$

$$r_2 = 25\% \text{ and } 30\% = 5\%$$

Apply the formula:

$$= 0.25 + [8124 \div 10595 \times 0.05]$$

$$= 0.25 + 0.03834$$

$$= 0.28834 \times 100$$

$$= 28.834\%$$

Advantages of IRR method

- (1) It recognizes the time value of money & is applicable for projects with different periods of time.
- (2) It considers the profitability of the projects in its entire economic life & hence enables evaluation of true profitability.
- (3) It provides an uniform ranking of various proposals because it is the percentage rate of return.

- (4) It is also compatible with the objective of maximum profitability & is considered to be more reliable technique of capital budgeting.

Disadvantages of IRR method

- (1) It is very difficult to calculate (different trial rates to be used under trial & error as base to find IRR.)
- (2) It is very difficult to understand & is the most difficult method of evaluation of investment proposals.
- (3) It is based on the assumption that the earnings are reinvested at the IRR in remaining life of the projects. It is not a justified assumption, particularly when the average rate of return earned by the firm is not close to the internal rate of return.
- (4) The results of NPV method & IRR method differs when the project under evaluation differs in their size, life, & cash flows.

Test of understanding-3

1. Define IRR.
-
-

2. You are required to compute IRR based on the following information:

Initial investment Rs. 60,000

Life of the Asset 4 years

Estimated annual cash flows:

I year Rs. 15000

II year Rs. 20000

III year Rs. 30000

IV year Rs. 20000

4.3.3 Profitability Index (Also known as Benefit Cost ratio)

PI identifies the relationship between the cost and benefits of a proposed project. Therefore, the PI is the ratio of the present value of cash flows to the initial investments of a project. It is also called as Benefit-cost ratio (BC ratio).

$$P.I = \frac{PV \text{ of cash inflow}}{\text{Initial investment}}$$

Initial investment

Decision Criterion: In this method, PI is greater than one when accepted, but a project is rejected when PI is less than one.

Computations:

Example 4.7

Consider the information available in the example 4.4. Find PI.

$$PI = [60,772/40,000] \times 100 = 151.93\%$$

Example 4.8

Consider the information available in the example 4.5. Find PI.

$$PI \text{ for } X = [411,060/200,000] \times 100 = 205.53\%$$

$$PI \text{ for } X = [413,140/200,000] \times 100 = 206.57\%$$

Advantages & Disadvantages of PI method

The method is a slight modification of the NPV method. The NPV method has one major drawback that it is not easy to rank projects whose cost differ significantly. To evaluate such projects, the profitability index method is most suitable. The other advantage & disadvantage are the same as that of the NPV method.

4.4 Financial Planning for a New Business

Financial planning is an important activity for every business irrespective of its age and size. As a financial manager, you have task of determining how your organization can afford to achieve its strategic goals and objectives. Generally, a company should create a financial plan immediately after the vision and objectives have been set. Financial plan describes the activities, resources, equipment and materials that are needed to achieve your objectives as well as the time frames involved. For new enterprises, the preparation of financial projections is integral in the business planning process. For larger companies, financial planning forms part of the annual budgeting exercise and play an important role in long-term planning, business appraisals, corporate development and so on. Your financial planning activity involves the following tasks:

- You have to assess your business environment
- You have to set and state your business vision, mission and objectives with clarity
- It is necessary that you identify the different types of resources needed to achieve your objectives
- You have to quantify the amount of resources (Labour, Equipment and Materials)
- You have to compute the total cost of each type of resources more accurately
- You have to summarize the costs in the form of a budget

- You have to identify any risks and issues involved with your forecast. If so, you should suggest the strategies to minimize these risks

Performing financial planning is critical to the success of any organization. It helps in setting the objectives which need to be achievable from the financial point of view. Also it helps you to set financial targets for the organization and reward your staff members for meeting these objectives within the budget level.

4.5 Summary

Capital budgeting techniques are useful tools for you as a finance manager in managing your organizational resources. Though all the capital budgeting process are important, there is an emphasis of quantitative/ financial items over qualitative factors. In this chapter, we have discussed five important tools for investment assessment which are used in making an effective resources allocation decision.

4.6 Self Assessment Questions and Problems

1. A company is considering an investment proposal to install a new milling control. The project will cost of Rs 50,000. The facility has a life expectancy of 5 years & no salvage value. The corporate tax rate is 55% & no investment allowance is allowed. The firm uses straight-line depreciation method. The estimated cash flows after payment of income tax from the proposed investment is as follows.

| Year | Cash flows (CFAT) |
|------|-------------------|
| 1 | 10000 |
| 2 | 11000 |
| 3 | 14000 |
| 4 | 15000 |
| 5 | 25000 |

Compute the following

- (a) Pay-back period
- (b) ARR
- (c) IRR
- (d) NPV @ 10% discount rate
- (e) PI @ 10% discount rate

2. A large size chemical company is considering to invest a project that cost Rs 4,00,000. The estimated salvage value is zero. Tax value is 55%. The company uses straight-line depreciation method. The prepaid cash flows before tax are as follows:

| Year | Cash flows (CFBT) |
|------|-------------------|
| 1 | 100000 |
| 2 | 100000 |
| 3 | 150000 |
| 4 | 150000 |
| 5 | 250000 |

Determine the following

- 1) PBP
 - 2) ARR
 - 3) IRR
 - 4) NPV @ 15%
 - 5) PI @ 15%
3. List the factors which influence the capital budgeting decisions of your firm.
4. What are “investment decisions”?
5. Explain the different forms of investment decisions

4.7 References and Further readings

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2. Khan and Jain, Financial Management (text, Problems, and cases), 5th Edition, Tata McGraw Hills Limited, New Delhi.
3. Prasanna Chandra, Financial Management, 5th Edition, Tata MaGraw Hills Limited, New Delhi.
4. Lawrence J Gitman, 2001, Principles of Managerial Finance, 9th Edition, Pearson Education Asia.
5. Sharma and Sasi K Gupta, Financial Management, Kalyani Publishers.

4.8 Answers for test of understanding

Test of understanding -1

Q2 – 5 years;

Q3 = Project A – 3 years and 6 months; project B – 4 years and 8 days. Hence A is preferable.

Test of understanding -2

Q3 – Original investment method 7.5 % and 6.67%

Average investment method 15% and 13.33%

Test of understanding -3

Q3 – IRR 14.45%

Chapter - 5
CAPITAL STRUCTURE

- 5.0 Introduction
- 5.1 Learning Objectives
- 5.2 Meaning and Definition of Capital Structure
- 5.3 Pattern of capital structure
- 5.4 Theories of capital structure
 - 5.4.1 Net Income Approach
 - 5.4.2 Net Operating Income Approach
 - 5.4.3 Modigliani Miller Approach
 - 5.4.4 Traditional Approach
- 5.5 Optimum Capital Structure
- 5.6 Factors determining capital structure
- 5.7 Summary
- 5.8 Self Assessment Questions
- 5.9 References and Further Readings

5.0 Introduction

A firm needs money on a regular basis in order to meet its day to day operations besides meeting the financial obligations such as pay interest, dividend and mandatory obligations like payment of taxes and so on. In chapter 2 (cost of capital), we have discussed that a firm can raise capital in two ways:

1. issue common and preferred shares and
2. Debt financing (borrowing loan from Banks, and issue of debentures or bonds)

Generally, debt can be in the form of procuring funds through bank loans, or it can be raised through a debt issue (issue of debentures and bonds). Similarly equity and preference shares can be done through public. The difference between these instruments are significant in terms of risk, required rate of return, tax treatment , voting rights, and priority of repayment in the event of liquidation of the company. However, you may use both these sources. You can issue bonds/debentures and common shares. In this context, as a finance manager, you need to answer the following questions:

1. What's the right mix between these three?
2. How much debt and how much equity & preference shares should give benefit to your firm?

Long term investment decisions are important because the primary source of a company's value is the cash flows generated by its assets. By comparison, the financing decision is less important but it can also have important effects on investment decisions. However given the importance of investment decisions, it seems sensible to suggest that a company's financing strategy should be designed to complement and support its investment strategy. Also as a judicious mix of long term sources in the capital structure of a firm, in turn, increases the value. Therefore, designing an optimal capital structure is a critical decision for any business organization. The decision is important not only because of the need to maximize returns to various organizational stakeholders, but also because of the impact such a decision has on an organization's ability to deal with its competitive environment.

5.1 Learning Objectives

After reading this chapter, you should be able to:

1. Understand the meaning and definition of Capital Structure
2. Understand the NI, NOI, and MM approach
3. Explain the influencing factors in determining the capital structure

5.2 Meaning and Definition Capital Structure

As a manager, you may need to procure funds to meet your requirements through various types of securities namely equity shares, preferences shares, and debt. Before procuring funds through these securities, you should decide the types of securities to be used and its proportion taking into consideration of cost of capital, impact on income and value of firm in advance. Therefore, it refers to the way you finances your assets through some combination of the securities i.e. the left hand side of the balance sheet. In simple words, a company's capital structure is the composition of its long term liabilities. Hence, capital structure is defined as:

“Capital Structure is the permanent financing of the firm, represented by long-term debt, preferred stock and net worth.” - **Weston and Brigham**

5.3 Pattern of capital structure

You should design the capital structure in such a way that it gives the maximum possible returns to the shareholders of your organization. Broadly speaking, the capital structure of a company may consist of any of the followings:

1. Equity shares only
2. Equity shares & Preference shares.
3. Equity shares & Debt.
4. Equity shares, Preference shares & Debt

Test of Understanding - 1

- | | |
|---|---------|
| 1. Can you define “capital structure”? | Yes/ No |
| 2. Can you give any two forms of capital structure? | Yes/ No |

5.4 Capital Structure Theories

It is well appreciated, if a company mixes its borrowed capital along with owner's capital, because such a capital structure helps increasing the shareholders return. This has been experienced by the mercantile community under the normal circumstances, employing the debt along with equity (is known as Financial leverage) will yield higher EPS and thereby the higher dividend declaring capacity in turn the value of the company. Therefore, the value of the concern is expected to be determined by its financial leverage. Some Financial Experts have concluded that financial leverage determines the value and hence, higher the degree of financial leverage greater the value of the firm. On the other hand, a group of authors differ with the above concept and opine that a firm's value is not depending on leverage. Value is independent of leverage. In this contest we come across the following important capital structure theories.

1. Net Income (NI) approach
2. Net Operating Income (NOI) approach
3. Modigliani-Miller (MM) approach
4. Traditional Approach

Presumptions

Capital structure theories can be better explained and illustrated by taking into consideration of the following presumptions.

1. A firm employs only two types of securities namely Equity and Debt.
2. The assets of a firm are presumed to remain constant since the firms follow 100% payout ratio.
3. Changes in the capital structure design is possible to a limited extent for example increase in debt followed by reduction of equity or vice versa.
4. There is no corporate tax. This assumption is removed later.
5. The firms operating in a market are exposed to the same degree of risk. Hence they can be grouped into different categories.

S= market value of Equity

D= Market value Debt

V= Value of the concern

X = Earning Before Interest and Tax (EBIT)

R = Interest

Y = Earning Available for Shareholders (EAS)

The relationship between K_o (Overall cost of capital), K_e (Cost of Equity), K_d (Cost of debt), can be given by two equations which can be derived mathematically.

$$K_o = K_e - (K_e - K_d) D/V$$

$$K_e = K_o + (K_o - K_d) D/S$$

5.4.1. Net Income (NI) Approach

This approach has been suggested by Durand. According to this approach,

1. A change in the capital structure causes a corresponding change in the overall cost of capital as well as value of the firm.
2. A higher financial leverage (i.e. debt content) will result in decline in the overall or weighted average cost of capital. This will increase the value of the firm and consequently increase the value of equity shares of the company. Reverse will happen in a converse situation.

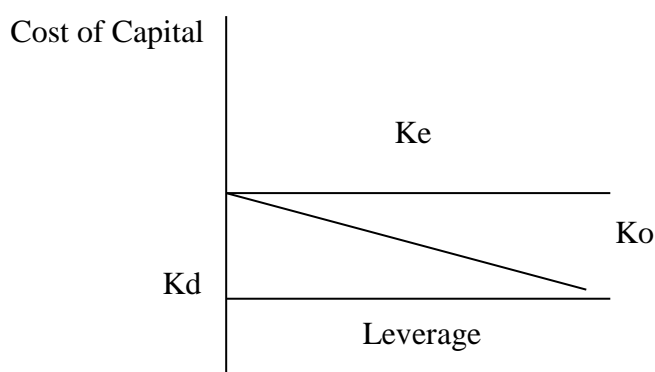
Presumptions:

1. There is no tax.
2. The cost of debt is less than cost of equity or equity capitalization rate.
3. The debt content does not change the risk perception of the investors.
Hence when the firm employs financial leverage (more of debt components) in its capital structure, it leads to decrease in the overall cost of the firm which in turn increases the value of the firm.

According to this approach

$$V = S + D$$

$$S = Y / K_e$$



Example 5.1

A firm has an expected net operating income of Rs. 1,00,000. Cost of equity for the firm is 10%, and it has Rs. 5,00,000 6% debentures. Calculate the value of the firm according to NI approach if the firm increases the debt content from Rs.5,00,000 to 7,00,000, What would be the value of the firm? What would be the overall cost of capital?

Solution:

| | | |
|--|----------|---------|
| If Debt content Rs. (D) | 500000 | 700000 |
| | | |
| EBIT (X) | 100000 | 100000 |
| Less: Interest | 30000 | 42000 |
| Earnings Available for equity shareholders (Y) | 70000 | 58000 |
| Cost of Equity (Ke) | 0.1 | 0.1 |
| Value of Equity (S) (Y/Ke) | 700000 | 580000 |
| Value of the Firm (V = S+D) | 1200000 | 1280000 |
| Overall cost of Capital (Ko = (X / V)) | 8.333333 | 7.8125 |

The above example reveals that

When K_o Increases - Value of the firm Decreases

K_o Decreases - Value of the firm Increases and

K_o is constant - Value of the firm remains constant i.e. $K_o = V$

5.4.2. Net Operating Income (NOI) approach

This approach has also been suggested by Durand. This is just opposite to the NI approach. According to this approach, a change in the capital structure does not affect the market value of the firm.

Presumptions:

1. A firm employs only two types of securities namely Equity and Debt.
2. The assets of a firm are presumed to remain constant since the firms follow 100% payout ratio.
3. Changes in the capital structure design are possible to a limited extent for example increase in debt content followed by reduction of equity content or vice versa.
4. There is no corporate tax.
5. When the firm increases the proportion of debt or substitute debt for equity, equity shareholders feel that they are exposed to a higher degree of financial risk. Hence when the firm increases the financial leverage, equity shareholders of the firm demand higher dividend. Thus increased leverage leads to an increase in the cost of equity.
6. The debenture funds are cheaper compared to equity funds. When the firm increases the debt capital or debenture by reducing equity content, the equity shareholders demand higher dividend which leads to an increase in the cost of equity. Hence the advantages of cheaper debt funds are exactly offset by an increase in the cost of equity. Thus overall cost of capital remains constant at varying degrees of leverage.

According to this approach

$$V = X/K_o \quad S = V - D$$

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

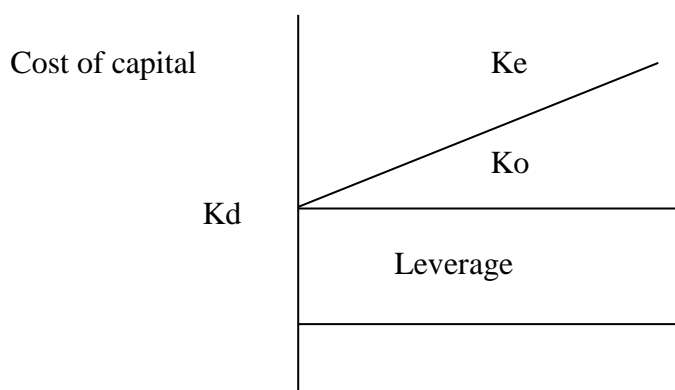
Example 5.2

EBIT = Rs. 100000, Overall cost of capital (K_o) = 10% Debt funds (K_d) = Rs. 500000 @ 6%. If the firm employs more of debt in its capital structure (say Rs. 700000,) what would be the change in the value of the firm?

Solution:

| | | |
|--|---------|----------|
| If Debt content (D) Rs. | 500000 | 700000 |
| EBIT (X) | 100000 | 100000 |
| Less: Interest | 30000 | 42000 |
| Earnings available for equity shareholders (Y) | 70000 | 58000 |
| K_o | 0.1 | 0.1 |
| Value of Equity ($S=V-D$) | 500000 | 300000 |
| $V = \text{Value of the Firm } (X / K_o)$ | 1000000 | 1000000 |
| K_e (cost of equity) | 14 | 19.33333 |

The above example shows that the firm raises the debt content by reducing its equity content, the change in capital structure kept the total value of the firm unchanged. However the equity capitalization rate is going upwards (from 14% to 19%).



Test of Understanding - 2

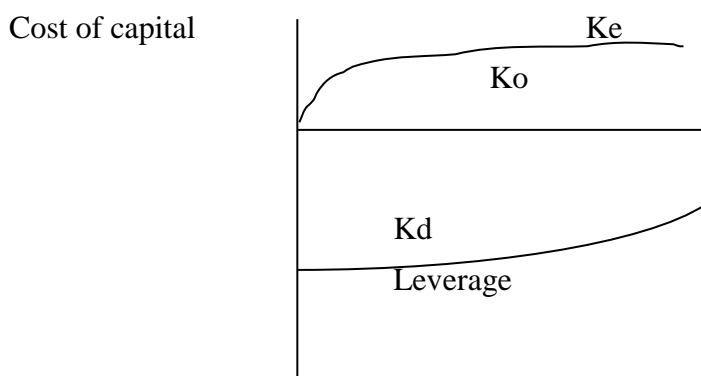
1. Can you state any four common assumptions between the NI and the NOI approach? Yes/ No
2. Can you recall the formula for computing Value of the firm according to the NOI approach? Yes/No

5.4.3. Modigliani- Miller (MM) Approach

MM approach was presented in 1958 on the basis of the relationship among the leverage, cost of capital and the value of the firm. This approach is similar to the NOI approach and has added to it the behavioral justification for their model. MM model is based on the following assumptions:

1. A firm employs only two types of securities namely Equity and Debt.

2. The assets of a firm are presumed to remain constant since the firms follow 100% payout ratio.
3. Changes in the capital structure design is possible to only a limited extent for example increase in debt content followed by reduction of equity content or vice versa.
4. There is no corporate tax.
5. Investors are presumed to be rational in nature.
6. A rational investors compare the investment with its return.
7. Rational investors will not hesitate to move one to another firm if it is advantages to him either in terms of investment or in terms of return. If an investors moves from one to another firm, it is described as “ARBITRAGE PROCESS” by the MM theory.
8. Existence of perfect securities market represented by large number of investors who are familiar with the prevailing rates of interest and dividend.
9. When an investors resorts to arbitrage process, non-existence of transaction cost is presumed by MM approach.
10. Investors may substitute personal leverage for corporate leverage.
11. Firm and individuals can borrow money from the market at the same rate of interest.
12. Investors when they move from one to another firm, by considering of their per cent of holding in that concern.



Example 5.3

There are two firms, A & B. These firms are alike and identical in all respect except that Firm B is levered firm and has debt content of Rs.50000 and Equity of Rs.40000 in its capital structure. On the other hand, firm A is an unlevered firm and has Rs. 100000 of share capital. Both these firms have an EBIT of Rs.10000 and the equity capitalization rate of 10% and the interest rate

is 6% for the levered firm. An investor “white” holds 10% in firm A. Will he get better returns by shifting his investment to firm B?

Solution:

A. Investors current position in Firm A with 10% holding:

| | |
|-----------------------------------|-----------|
| Investment (10% of Rs.100000) | Rs. 10000 |
| Dividend Income (10% of Rs.10000) | Rs. 1000 |

B. If the investor sells his holding in firm A and purchases 10% of the firm B which consists of both Equity and Debentures securities:

| Investment Income | | |
|-------------------|-------------|-------------|
| Debt | 5000 | 300 |
| Equity | 4000 | 700# |
| Total | <u>9000</u> | <u>1000</u> |

Dividend Income = $[\text{EBIT} - \text{Interest}] \times 10\%$ therefore $[10,000 - 3000] \times 10\%$

An investor prefers alternative A to B, as he is able to earn the same income with less outlay.

C. An investor invests the entire sum of Rs. 10000 in firm B

| | Investment | Income |
|-------------------------------|--------------|----------------|
| Debt $[10000 \times 5 / 9]$ | 5556 | 333.36 |
| Equity $[10000 \times 4 / 9]$ | <u>4444</u> | <u>777.70</u> |
| Total | <u>10000</u> | <u>1111.06</u> |

He augments his income by Rs.111.06. thus in both the cases, the levered firm offers better returns to the investors compared to the returns offered by the unlevered firm.

Example 5.4

There are two firms, A & B. These firms are alike and identical in all respect except that Firm B is levered firm and has debt content of Rs.40000 and Equity is Rs.60000 in its capital structure. On the other hand, firm A is an unlevered firm and has Rs. 100000 of share capital. Both these firms have an EBIT of Rs.10000 and the equity capitalization rate of 10% and the interest rate for the levered firm is 6%. An investor ‘Black’ holds 10% in the equity of firm B. He plans to shift his investments to the unlevered firm by adopting personal leverage i.e borrowing from the market. Will he benefit by his move?

Solution:

A. an investor current position firm B with 10% holding equity

| | |
|--|----------|
| Investment (10% of Rs.60000) | Rs. 6000 |
| Dividend Income (10% of (Rs.10000-3000)) | Rs. 700 |

B. If an investor sells his holding in firm B and purchases 10% of the Firm A

| | |
|---|----------------|
| Equity (10% of Rs.100000) | Rs. 10000 |
| (Available funds Rs.6000 + Borrowed Funds | Rs. 4000) |
| Dividend Income | Rs. 1000 |
| Less: Interest | Rs. 240 |
| | <u>Rs. 760</u> |

The investor gets more returns by adopting the personal leverage strategy. Though an investor is getting more income, he has to consider the risk factor along with voting rights.

5.4.4. Traditional Approach

It is based on the concept of diminishing utility. It is an approach, which is opined to be an intermediary or compromise between the NI and the NOI approach. The traditional school of thought is based upon the important theory of diminishing marginal return or diminishing marginal utility. When the firm substitutes debentures in place of equity since the debentures funds are cheaper, Value of the concern increases by experiencing a reduction in overall cost of capital. But this cannot be carried on infinite extent. Every firm has debt bearing capacity. When a firm borrows debentures up to the optimum capacity the leverage is favourable (Leading to increase in the value of the concern.) When the firm borrows debentures beyond such optimum point, the cost of debt increases and the cost of equity also increases thereby overall cost of capital also exhibits an increase leading to reduction in the value of the concern. Thus, we can conclude that by employing a leverage a firm can increase its value up to optimum point only. Beyond which leverage turnout to be unfavourable resulting decrease in the value of the concern.

Example 5.5

A firm has an operating income of Rs. 150000 initially. It employed no debt components at all. At that time equity holders are expecting 10% dividend. Subsequently the concern borrows 6% debentures for Rs. 300000, which leads the equity shareholders to expect 11% dividend. Further when the concern borrows total of Rs. 600000 by issuing debentures, the debenture holders demand 7% interest and the equity holders expects 12.5% dividend. Calculate

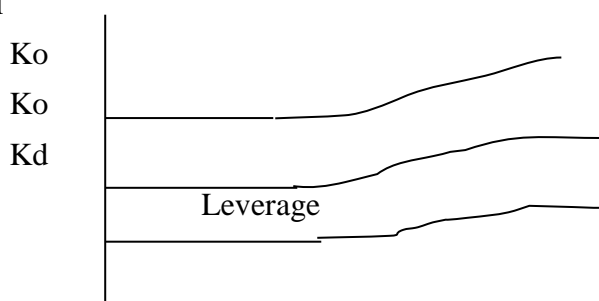
the value of the firm according to traditional approach under the following three situations.

1. Unlevered firm,
2. Levered firm (Rs.3,00,000 debentures @6%)
3. Rs. 6,00,000 debentures @7%

Solution:

| Particulars | Plan 1 | Plan 2 | Plan 3 |
|------------------------------------|---------|---------|---------|
| EBIT | 150000 | 150000 | 150000 |
| Less: Interest | 0 | 18000 | 42000 |
| Earning Available for Shareholders | 150000 | 132000 | 108000 |
| Cost of Equity | 0.1 | 0.11 | 0.125 |
| Equity | 1500000 | 1200000 | 864000 |
| Debenture | 0 | 300000 | 600000 |
| Value of the firm | 1500000 | 1500000 | 1464000 |
| Overall Cost of capital | 10 | 10 | 10.2459 |

Cost of capital



From the above example, we can conclude that by employing a leverage a firm can increase its value up to optimum point only (upto plan 2). In plan 3 the leverage turnout to be unfavourable resulting decrease in the value of the concern.

Test of Understanding

1. Can you define arbitrage process? Yes/ No
2. Can you state the four assumptions of apart from the common assumptions? Yes/No
3. Can you define the “marginal utility concept”? Yes/No

5.5 Optimum Capital Structure

In the previous section, various theories of capital structure have been discussed. Though the theories have given different views, you may find an optimal capital structure i.e., a debt-equity mix at which the cost of capital is minimized and value of the firm is maximized. Theoretically speaking, this is possible only when there is a judicious use of debt and equity in capital structure which can maximize the value of the firm.

But, how can you find an ideal debt equity mix?

If you use the debt in the capital structure, you can enjoy the tax benefits for interest payments which results in relatively higher profits for the shareholders. But it does not mean that you should go on increasing the debt proposition in your capital structure. As discussed above, only optimum use of debt creates the shareholders benefits. Extreme use of debt, it leads a company to sick status. Any attempt to design a capital structure therefore, is undertaken in the light of two propositions:

1. The capital structure is designed in such a way that it leads the company in obtaining maximize shareholders wealth, and
2. The exact optimal capital structure may be impossible and therefore, efforts be made to achieve the best approximation to the optimal capital structure.

In practice, the design of the capital structure differs from one firm to another in respect of size, nature, earnings, cost of funds, competitive conditions, market expectations, risks and so on. Therefore, the theories of capital structure may provide only a broad theoretical framework analyzing the relationship among leverage, cost of capital and value of the firm. You however, should go beyond these considerations as no theoretical model can incorporate all these subjective features. In fact, you should consider all the related factors (qualitative, quantitative and subjective) and factor them in the process of planning and designing a capital structure. Besides, the interest of the shareholders, debt holders and also that of management is to be suitably taken care of. Above all, the legal provisions if any regarding the capital structure should also be considered.

5.6 Factors affecting capital structure

The following important factors should be taken into consideration while designing the capital structure of a company

1. **Trading on Equity:** A company can make use of either equity components or debt components or both in its capital structure. If the company makes use of only the equity components of capital then the

entire post tax earnings of the company is to be distributed only among the equity shareholders. On the contrast, if the company employs both debt and equity components in its capital structure, the earnings are to be shared among the debt and equity shareholders. In such cases, the company's equity shareholders are having reduced share in the earnings of the company while compared to the situation of the company's capital structure consisting of equity components only. Therefore when the company employs debt components in its capital structure it is said to be trading on equity (reducing the share of equity component). So, this is one of the important factors determining the capital structure of a company.

2. **Control:** Quite often the decision making power lies in the hands of equity shareholders. When the company issues additional equity shares, it dilutes the control of the existing shareholders. On the other hand if the company issues debt then it will not dilute the control of equity shareholders because the debenture or bond holders do not have the voting rights.
3. **Nature of Business:** This must be taken into account because the nature of business plays an important role in designing a company's capital structure. Companies differ in their capital structure according to the amount of investment, risk, trade cycle, competition and so on.
4. **Period of finance:** If you require the funds on permanent basis, it is preferable to issue equity shares. Otherwise, you may issue redeemable preference shares or debentures.
5. **Cost of financing:** Your capital structure should offer minimum cost of financing. Usually debt is cheaper source of funds when compared to preference and equity share capital. This is due to the risk involved in case of equity shares and rate of dividend payable to the preference shareholders.
6. **Market conditions:** Depends on the prevailing capital market conditions, you have to select the capital structure and issue the securities accordingly. During recession, it is comparatively easier to mobilize the funds through issue of debentures and preference shares. On the other hand, during booming capital market condition, the investors may prefer to take risk and invest in equity shares.
7. **Legal restrictions:** It is important to consider the statutory requirements before the capital structure is framed. For example, the banking companies are permitted to issue only equity shares as per the Banking Companies Regulation Act.

5.7 Summary

In this chapter we discussed about the capital structure, its various forms and significant factors are to be considered while planning the capital structure. Also we discussed the relationship between capital structure and the value of the firm through various theories along with examples.

5.8 Self Assessment Questions

1. Define capital structure?
2. Explain the factors to be taken into account for determining the capital structure of the company.
3. Mention the common presumptions of capital structure theories.
4. Explain “Arbitrage Process’ under MM approach.
5. What is optimal capital structure?
6. Mention the three basic approaches to determine appropriate financing mix.
7. Compare Net Operating Income approach with Net Income approach.

5.9 References and Further readings

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Chapter - 6

LEVERAGES

- 6.0 Introduction
- 6.1 Learning Objectives
- 6.2 Meaning and Definition of Leverage
- 6.3 Types of Leverages
 - 6.3.1 Operating Leverage
 - 6.3.2 Financial Leverage
 - 6.3.3 Combined Leverage
- 6.4 Importance of Leverages
- 6.5 Summary
- 6.6 Self Assessment Questions/ Problems
- 6.7 References and Further Readings
- 6.8 Answers for Test of understanding

6.0 Introduction

As per our discussion in the last chapter (capital structure), a firm can issue bonds/debentures and common shares, but what's the right mix between these two? How much debt and how much equity should give benefit to you? Generally, debt can be made privately through bank loans, or it can be mobilized publicly through a debt issue. In this chapter, we will discuss about the use of debt and its consequence. The judicious use of debt along with owners' funds can make a company more profitable and give higher returns to its shareholders. On the other hand, use of debt beyond the optimal level will result in huge losses being incurred by the firm. Therefore, a firm should identify the optimum level of debt equity mix and mobilize the funds accordingly. In other words, financial leverage is a double edged sword.

A firm also gets benefits by its cost structure i.e a firm can have better contribution margin by employing more of fixed cost (assets) components in its operations. In such a firm, the fixed cost is already covered and hence the firm aims at competing on the basis of contribution margin. Therefore, such a firm's decisions are based on contribution margin and not on profit margin. A firm also enjoys financial benefits by employing both financial and operating leverage, which is known as combined or total leverage. In this chapter, we will discuss in detail all the three types of leverages.

6.1 Learning Objectives

After reading this chapter, you should be able to:

1. Define the term leverage
2. Understand the concepts, measurement and implication of operating leverage, financial leverage and combined leverage
3. Understand the EBIT-EPS approach to compare alternative capital structure
4. Explain the relationship between leverage and risk of a firm

6.2 Meaning and Definition of Leverages

The term 'Leverage' is derived from the word 'lever'. A lever is a simple tool by which a large weight can be moved with a small force. The dictionary meaning of the term leverage refers to "an increased means of accomplishing some purpose ". However, in the area of finance, the term leverage has a special meaning. It is used to describe the firm's ability to use fixed cost assets or funds to magnify the return to its owners. It may be defined as:

“the employment of an asset or funds in which the firm pays a fixed cost or fixed return”- *James Home*

The fixed cost (also called fixed operating cost) and fixed returns (called financial cost) remain constant irrespective of the changes in the volume of output / sales. Thus, the employment of assets / source of funds influence earnings available for equity share holders. It must, however, be noted that higher is the degree of leverage, higher is the risk as well as return to the owners. It may be favourable or unfavourable.

6.3 Types of Leverage

Commonly used measures of leverage in Financial Analysis are:

1. Operating leverage
2. Financial leverage
3. Composite leverage.

The three types of leverage can be defined with reference to the income statement of a firm.

| | | |
|---|---|----------------------|
| Operating | Sales revenue | leverage |
| | Less: Cost of goods sold | |
| Financial Total | Gross margin | Leverage Leverage |
| | Less: Operating expenses | |
| | Earnings before interest and taxes (EBIT) | |
| | Less: Interest | |
| | Earnings before taxes | |
| | Less: Taxes | |
| | Net income after taxes (NIAT) | |
| Less: Preferred share dividends | | |
| Earnings available for shareholders (EAS) | | |
| Earnings per share (EPS) | | |

Before discussing the types of leverages, let us discuss the concept of break even analysis which lays the foundations for leverage concepts by demonstrating the effects of fixed costs on the business operations.

What is breakeven analysis?

Breakeven analysis is also known as cost-volume-profit analysis. It refers to the level of business operation which is required to get back the fixed

cost investments made in the business. Operating breakeven point is the level of sales which recovers all the operating cost of the business unit i.e. EBIT = 0.

How to find the breakeven point?

The first step requires you to divide the cost of goods sold and operating expenses into fixed and variable cost. (I hope that you are familiar with fixed and variable costs). In the second step you get into the task of computation of contribution. In the third step you have to apply the following formula:

$$\text{Break even point (in units)} = \text{Fixed Cost} / \text{Contribution per unit}$$

$$\text{Break even point (in Rupees)} = [\text{Fixed cost} / \text{contribution}] \times \text{sales}$$

$$\text{Contribution} = \text{Sales} - \text{Variable cost}$$

Example 6.1

A firm has fixed operating costs of Rs. 3,000. The sale price per unit is Rs. 10, with a variable cost per unit of Rs. 4. At what point of sales (units and sales revenue) would EBIT be zero?

$$\text{Contribution per unit} = \text{Rs. } 10 - 4 = \text{Rs. } 6$$

$$\text{Breakeven point (in Units)} = \text{Rs. } 3000 \div 6 = 500 \text{ units}$$

$$\text{Breakeven Point (in Rupees)} = \text{Rs. } 3000 \div 6 \times 10 = \text{Rs. } 5000$$

At sales of 500 units, the firm's EBIT is zero. If the company sells more than 500 units, EBIT is greater than zero (EBIT > 0). On the other hand, if the company sells less than 500 units, EBIT is less than zero i.e loss (EBIT < 0).

Notes: A company's BEP is sensitive to number of variables namely fixed cost, selling price, and variable cost. The effects of these variables in BEP are given below:

Increase in fixed costs – Breakeven point increases

Increase in selling price – Breakeven point decreases

Increase in variable costs – Breakeven point increases

Decrease in fixed costs – Breakeven point decreases

Decrease in selling price – Breakeven point increases

Decrease in variable cost – Breakeven point decreases

Let us discuss the types of leverage in detail.

6.3.1 Operating Leverage

Operating leverage refers to the extent to which the firm has fixed operating costs. In other words, operating leverage is a measure of the extent to which, fixed operating costs are being used in an organization. It is greatest (largest) in companies that have a high proportion of fixed operating costs in relation (proportion) to variable operating costs. This type of company is using

more of fixed assets in the operation of the company. Conversely, operating leverage is lowest in companies that have a low proportion of fixed operating costs in relation to variable operating costs. Firms with large amounts of fixed operating costs have high break-even points and high operating leverage. Variable cost in these firms tends to be low and both the contribution margin (CM) and unit contribution (UC) margin is high.

Formula(s) for calculating Operating leverage:

$$\text{Operating leverage} = \frac{\text{Contribution}}{\text{Operating profit}} \quad \text{or} \quad \frac{C}{OP}$$

$$\text{Contribution} = \text{Sales} - \text{Variable cost} \quad \text{or} \quad \text{Fixed cost} + \text{Profit}$$

$$\text{Operating profit} = \text{EBIT} = [\text{Sales} - \text{Total cost (TC = VC + FC)}] \quad \text{or} \quad [\text{Contribution} - \text{Fixed cost}]$$

Degree of operating leverage:

Generally, the percentage change in sales will be equal to the percentage change in profit. Due to fixed cost, the percentage change in profits will be more than the percentage change in sales volume.

$$\text{DOL} = \frac{\text{Percentage Change in profits}}{\text{Percentage Change in sales}}$$

Example 6.2

Consider example 6.1. Suppose the company is currently selling 700 units. What is Operating Leverage of the company?

| Particulars | Amount |
|---|--------|
| Sales [700 x 10] | 7000 |
| Less: Variable Cost [700x 4] | 2800 |
| Contribution | 4200 |
| Less: Fixed Cost | 3000 |
| Earnings Before interest and Tax (EBIT) | 1200 |

$$\text{Operating Leverage} = \text{Rs. } 4200 \div \text{Rs. } 1200 = 3.5$$

From the above, it is clear that a percent change in sales will change the profits by 3.5 per cent. This can be examined when sales increase to Rs. 14000, the profit in such event will be as under:

| Particulars | Amount |
|-------------------------------|--------|
| Sales [1400 x 10] | 14000 |
| Less: Variable Cost [1400x 4] | 5600 |

| | |
|---|------|
| Contribution | 8400 |
| Less: Fixed Cost | 3000 |
| Earnings Before interest and Tax (EBIT) | 5400 |

In the above example, the amount of sales increase from Rs.7,000 to Rs. 14,000 i.e. 100 per cent increase in sales. The EBIT has increased from Rs. 1,200 to Rs. 5400 i.e. by Rs. 4,200 (giving an increase of 350 per cent). The above example reveals that a per cent change in the amount of sales changes the profit by 3.5 per cent. This has been verified by the above example where a 100 per cent increase in sales has resulted in 350 per cent change in profits. Thus the degree of operating leverage is as under:

$$\text{DOL} = \frac{\text{Percentage Change in profits}}{\text{Percentage Change in sales}}$$

$$\text{DOL} = 350 \div 100 = 3.5$$

Therefore, for every one per cent change in sales, EBIT changes by DOL per cent. However, operating leverage exists only when the operating leverage is greater than one.

Example 6.3

The installed capacity of a factory is 600 units. Actual capacity utilization is 46.67 per cent i.e 400 units. Selling price per unit is Rs. 10. Variable cost is Rs. 6 per unit. Calculate the operating leverage in each of the following three situations:

1. When fixed costs are Rs.400
2. When fixed costs are Rs.1000
3. When fixed costs are Rs.1200.

Solution

Statement showing operating leverage

| | Situation | | |
|----------------------|-----------|------|------|
| | 1 | 2 | 3 |
| Sales | 4000 | 4000 | 4000 |
| Less: Variable Cost | 2400 | 2400 | 2400 |
| Contribution | 1600 | 1600 | 1600 |
| Less: Fixed Cost | 400 | 1000 | 1200 |
| EBIT (or)OP | 1200 | 600 | 400 |
| Operating Leverage = | 1600 | 1600 | 1600 |
| | 1200 | 600 | 400 |

$$= 1.33 \qquad 2.67 \qquad 4.$$

The above examples show that DOL increases with every increase in the share of fixed cost in the total cost structure of the firm.

Significance of Operating Leverage: The concept of operating leverage explains the impact of changes in sales on the operating income of a firm. A concern having higher Degrees of Leverage can experience a magnified effect on EBIT, for even a small change in its Sales level can dramatically change its operating profit. If operating leverage is high, it means that break -even point will be reached at a higher level of sales and the margin of safety is lesser in such cases.

Test of Understanding -1

1. What is leverage?
2. State the different types of leverage.
3. Explain the significance of operating leverage.
4. The installed capacity of Black & White Company's factory is 500 units. Actual capacity utilization is 300 units. The company's selling price is Rs.15 and variable cost per unit is Rs. 7. Calculate the operating leverage when fixed costs are Rs.500, Rs. 1000 and Rs.1500.

6.3.2 Financial Leverage or Trading on Equity

As per our discussion in chapter 5 (Capital Structure), finance Leverage is related to the financing structure of the company. It involves changes in shareholder's earnings (i.e. EPS) in response to changes in operating profit (EBIT), resulting from the presence of fixed income bearing securities (financial charges say interest or preference dividend or both) in the company's capital structure. In simple words, financial leverage is concerned with the relationship between EBIT and EPS. Hence, financial leverage is defined as "the ability of a firm to use the fixed income bearing securities in its capital structure to magnify the effect of changes in EBIT/Operating profits, on the firm's EPS".

Suppose a company employs equity shares only on its capital structure, the percentage change in EBIT will cause the same level of changes in shareholders earnings. For instance, a 10 per cent increase in operating profit will result in a 10 per cent increase in shareholders earnings. On the other hand, a company employs both debt and equity, the change in EBIT will cause more or less changes in shareholders earning which depends on the mix of debt-equity in its capital structure.

Therefore, financial leverage refers to the extent to which the firm has fixed financing costs arising from the use of debt capital. A firm with higher

degree of financial leverage will have relatively higher fixed financing costs compared to a firm with lower degree of financial leverage. Fixed finance charges do not vary with the level of EBIT and have to be paid regardless of the amount of EBIT of the company. The rest of the earnings (after paying the fixed financial obligation) belong to the equity shareholders of the company. The effect of changes in operating profit or EBIT on the level of EPS is measured by FL.

Now let us discuss how to compute the earnings per share under various financing alternatives and the impact of fixed costs on EPS.

Example 6.4

ABC Company has the capital structure consisting of 15,000 equity shares of Rs.100 each. The management is planning to raise another Rs.25 lakhs to finance a major programme of expansion and is considering three alternative methods of financing

1. To issue 25,000 equity shares of Rs.100 each
2. To issue 25,000, 8% debentures of Rs.100 each
3. To issue 25,000, 8% preference shares of Rs.100 each

The company's expected earnings before interest and taxes will be Rs.8 lakhs. Assuming a corporate tax rate of 50% determine the EPS in each alternative and comment which alternative is best why?

Solution:

| Particulars | Plan 1 | Plan 2 | Plan 3 |
|--|--------|--------|----------|
| EBIT | 800000 | 800000 | 800000 |
| Less: Interest | 0 | 200000 | 0 |
| Profit before Tax | 800000 | 600000 | 800000 |
| Less: Tax @ 50% | 400000 | 300000 | 400000 |
| Profit after Tax | 400000 | 300000 | 400000 |
| Less: Preference Dividend | 0 | 0 | 200000 |
| Earnings Available for Shareholders (EAS) | 400000 | 300000 | 200000 |
| No. of outstanding Equity Shares | 40000 | 15000 | 15000 |
| EPS (EAS ÷ No. of outstanding equity shares) | 10 | 20 | 13.33333 |

Comments: As EPS is the highest in Plan 2 i.e. the company should issue 25000, 8% debentures of Rs.100 each. It will double the EPS without loss

of any control over the company. The same calculations can be done through the following formula:

$$\frac{(X - I) (1 - T) - PD}{S}$$

Where X = EBIT

I = Interest under

S= No. of outstanding Equity Shares

PD= Preference Dividend

T = Tax rate

Break-even EBIT level (or Indifference point)

Break-even EBIT level is the indifferent point where EPS under alternative financing plan is the same. Mathematically, the break-even EBIT level is:

$$\frac{(X - I_1) (1 - T) - PD}{S_1} = \frac{(X - I_2) (1 - T) - PD}{S_2}$$

Where X = Point of Indifference

I₁ = Interest under Plan 1

I₂ = Interest under Plan 2

S₁= No. of Equity Shares under Plan 1

S₂= No. of Equity Shares under Plan 2

PD= Preference Dividend

T = Tax rate

Example 6.5

A project under consideration by your company requires a capital investment of Rs. 60 lakhs. It has the following two alternatives in financing the project cost:

Alternative 1: 100 per cent Equity

Alternative 2: Debt –equity ratio of 2:1

Interest on term loan is 10% and tax rate is 50%. Calculate the point of indifference between these two alternative methods of financing the project.

Solution:

The company has two alternative plans and its financial charges are as below:

1. Fully Equity i.e. by issue of 600000 equity shares of Rs.10 each amounting to Rs.60 lakhs. (Here no financial charges are involved)

2. By raising funds of Rs.40 lakhs by way of Debt and Rs.20 lakhs by issue of Equity shares. (Here financial charges are Rs. 40,00,000 x 0.10 = Rs. 400,000)

$$\frac{(X - I_1) (1-T) - PD}{S_1} = \frac{(X - I_2) (1-T) - PD}{S_2}$$

$$\frac{(X - 0) (1-0.5) - 0}{6} = \frac{(X - 4) (1-0.5) - 0}{2}$$

$$\frac{0.5X}{6} = \frac{0.5X - 2}{2}$$

$$X = 3X - 12$$

$$X = 6$$

The point of indifference i.e. break even level of EBIT is Rs.6 lakhs.

Now we move on to measure financial leverage:

Approach-1:

Formula for computation of financial leverage

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

1. When capital structure consists of equity and debt:

$$FL = EBIT \div \text{Earning before tax (EBT)}$$

$$\text{Computation of EBT} = [EBIT - I]$$

2. When capital structure consists of equity & preference capital:

$$FL = EBIT \div \text{Earning before tax (EBT)}$$

$$\text{Computation of EBT} = EBIT - I - (PD \times [1 \div 1-T])$$

3. When capital structure consists of Equity, Preference, and Debt Securities

$$FL = EBIT \div \text{Earning before tax (EBT)}$$

$$\text{Computation of EBT} = EBIT - I - (PD \times [1 \div 1-T])$$

Note: In the denominator, the term $(1 \div 1-T)$ converts the after tax preference dividend to a before tax in order to maintain consistency with other terms.

Where FL = Financial Leverage

EBIT = Earnings before interest and tax

I = Interest

PD =Preference dividend

T = Tax rate

$$\text{Degree of Financial Leverage} = \frac{\text{Percentage Change in taxable income}}{\text{Percentage Change in operating income}}$$

Example 6.6

Jai & co. has a choice of the following two financial plans. Interest rate is 10 per cent on debt in both the situations. Compute the financial leverage in each situation and interpret it.

| Particulars | A | B |
|----------------|------|------|
| Equity Capital | 4000 | 2000 |
| Debt | 4000 | 6000 |
| EBIT | 800 | 800 |

Solution:

| Particulars | A | B |
|--------------------------------|-----|-----|
| EBIT | 800 | 800 |
| Less: interest | 400 | 600 |
| Earnings before tax (EBT) | 400 | 200 |
| Financial leverage [EBIT÷EBT] | 2 | 4 |

Financial leverage in situation 'A' is '2' which indicates that every one per cent change in EBIT results in two per cent change in taxable profit. Similarly, in situation 'B' is 4 indicates that every one per cent change in EBIT results in four per cent change in taxable profit. This can be examined when EBIT is increased from Rs.800 to Rs. 1600; the taxable profit in such event will be as under:

| Particulars | A | B |
|---------------------------|------|------|
| EBIT | 1600 | 1600 |
| Less: interest | 400 | 600 |
| Earnings before tax (EBT) | 1200 | 1000 |

In the above example, situation 'A' indicates that the EBIT increased from Rs.800 to 1600 i.e. 100 per cent increased. The taxable profit has increased from Rs. 400 to 1200 i.e. by Rs. 800 (giving an increase of 200 per cent). The above example implies that percent change in the amount of EBIT leads to 2 per cent change in the taxable profit for situation 'A'. This has been verified by the above example where a 100 per cent increase in EBIT has

resulted in 200 per cent profits. Thus the degree of financial leverage is as under:

$$\text{Degree of Financial Leverage} = \frac{\% \text{ Change in taxable income}}{\% \text{ Change in operating income}}$$

$$\text{DFL} = 200 \div 100 = 2$$

Please compute for situation ‘B’ and check yourself.

Therefore, for every one per cent change in EBIT, the taxable profit changes by DFL per cent. However, financial leverage exists only when the financial leverage is greater than one.

Example 6.7

Surya Limited has the following capital structure:

| | |
|---|-------------|
| Equity capital (Rs.10 per share) | Rs. 200,000 |
| 10% Preference shares (Rs.10 per share) | Rs. 200,000 |

The company’s EBIT is Rs.80, 000 and tax rate is 50%. Compute the financial leverage. What would be the new financial leverage in case of the EBIT increased to Rs. 100,000?

Solution:

$$\text{FL} = \frac{\text{EBIT}}{\text{EBIT} - \text{I} - (\text{PD} \div [1 - \text{T}])}$$

If EBIT is Rs. 80,000

$$\text{FL} = \frac{80,000}{80,000 - 0 - [20,000 \div [1 - 0.50]]} = \frac{80,000}{40,000} = 2$$

If EBIT is Rs. 100,000

$$\text{FL} = \frac{100,000}{100,000 - 0 - [20,000 \div [1 - 0.50]]} = \frac{100,000}{60,000} = 1.67$$

Example 6.8

Jai auto Limited has the following capital structure:

| | |
|---|-------------|
| Equity capital (Rs.10 per share) | Rs. 200,000 |
| 10% Preference shares (Rs.10 per share) | Rs. 200,000 |
| 9% Debentures | Rs. 250,000 |

The company’s EBIT is Rs.100, 000 and tax rate is 50%. Compute the financial leverage.

Solution:

$$FL = \frac{EBIT}{EBIT - I - (PD \div [1-T])}$$

$$FL = \frac{100,000}{100,000 - 22,500 - [20,000 \div [1-0.50]]} = \frac{100,000}{37,500} = 2.67$$

Approach -II

Alternative way to compute the Degree of financial leverage:

$$\text{Degree of Financial Leverage} = \frac{\text{Percentage Change in EPS}}{\text{Percentage Change in EBIT}}$$

Example 6.9

Goodwill limited has the following capital structure:

| | |
|---|------------|
| 20,000 Equity shares of Rs.10 each | Rs.200,000 |
| 4,000 10% Preference shares of Rs. 100 each | Rs.400,000 |
| 4,000 10% Debentures of Rs.100 each | Rs.400,000 |

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

- Rs. 150,000
- Rs. 120,000
- Rs.200,000.

The firm has 50% tax bracket. Compute also the financial leverage taking EBIT for 'a' as a base.

Solution:

| Particulars | Option A | Option B | Option C |
|--|----------|----------|----------|
| EBIT | 150,000 | 120,000 | 200,000 |
| Less: Interest on debentures | 40,000 | 40,000 | 40,000 |
| EBT | 110,000 | 80,000 | 160,000 |
| Less: Tax @ 50% | 55,000 | 40,000 | 80,000 |
| EAT | 55,000 | 40,000 | 80,000 |
| Less: Preference Dividend | 40,000 | 40,000 | 40,000 |
| Earnings available for shareholders (EAS) | 15,000 | Nil | 40,000 |
| No. of outstanding equity shares | 20,000 | 20,000 | 20,000 |
| EPS (EAS ÷ no. of outstanding equity shares) | 0.75 | Nil | 2.00 |

The above table shows that: (Option A as a base)

- a. EBIT of the option B is reduced by 20% (i.e from Rs.150,000 to 120,000 = Rs.30,000) while EPS has reduced by 100%.
- b. EBIT of the option C is increased by 33.33% (i.e from Rs.150,000 to 200,000 = Rs.50,000) while EPS has reduced by 166.67%.

Thus, DFL between option A & B = $100 \div 20 = 5$

DFL between option A & C = $166.67 \div 33.33 = 5$

The same result can be obtained by using approach I formula:

$$FL = \frac{EBIT}{EBIT - I - (PD \div [1-T])}$$

$$FL [A] = \frac{150,000}{150,000 - 40,000 - [40,000 \div [1 - 0.50]]} \times \frac{150,000}{30,000}$$

$$= 5$$

This reveals that one per cent change in operating profit will change the profit before tax by five per cent. Similarly you can calculate and check yourself for situation B & C.

6.3.3 Composite Leverage [or Total Leverage]

The two types of leverage namely operating and financial leverage explored so far can be combined into an overall measure of leverage called combined leverage. Recall the above discussion where we have state that the concept of operating leverage explains the relationship between sales and operating profits, and the financial leverage explains the relationship between operating profits and earnings per share. Therefore, composite leverage is concerned with relationship between sales and earnings per share i.e focusing on the entire income of the company. Specifically, composite leverage is concerned with the sensitivity of earnings to a given change in sales. It involves a certain amount of risk which can be divided into two parts: Business risk and financing risk. These factors should be properly assessed by the management before using the composite leverage.

A greater DOL or DFL will raise DTL. DTL is a measure of the overall riskiness or uncertainty associated with shareholder's earnings that arises because of operating and financial leverage which can be combined in a different ways (The higher degree of financial leverage may be offset by lower degree of operating leverage and vice-versa) to obtain a desirable degree of total leverage and acceptable level of total risk.

Composite of leverage = Operating leverage X Financial leverage.

Degree of Composite Leverage (DCL) = % change in EPS

% change in sales

Example 6.10

A company has sales of Rs.6,00,000, variable costs of Rs.3,00,000, fixed costs of Rs.1,00,000 and long-term loans of Rs.4,00,000 at 10% rate of interest . Calculate the composite leverage?

Solution

$$(1). OL = \frac{\text{Contribution}}{\text{EBIT}} = \frac{2,00,000}{1,00,000} = 2.$$

$$(2). FL = \frac{\text{OP}}{\text{PBT}} = \frac{1,00,000}{60,000} = 1.666$$

$$(3). OL = OL \times FL = 2 \times 1.666 = 3.333$$

Test of understanding -2

1. Can you define “Financial Leverage”? Yes/No
2. Can you define “Total Leverage”? Yes/No
3. The following figures relate to two companies:

| | P ltd., | Qltd., |
|--------------|-----------------|--------|
| | (Rs. in lakhs) | |
| Sales | 600 | 1000 |
| VC | 200 | 300 |
| Contribution | 300 | 700 |
| FC | 160 | 400 |
| EBIT | 160 | 300 |
| Interest | 60 | 100 |
| EBT | 100 | 200 |

- 1). You are required to calculate OL, FL ,CL: and
- 2). Comment on the relative risk portion of them.

6.4 Importance of Leverage

I hope that you have realized how important it is to manage your finance and what it takes to change for the better (financially and personally). You need a form of leverage to get higher level of financial benefits. The following are some of the advantages of leverage:

1. It helps to measures the business risk
2. It helps in understanding the debt components and its consequences
3. It helps to assess the impact of change of sales on their operating profit and in turn, earnings of the equity shareholders.

6.5 Summary

In this chapter, we have discussed about debt and its consequence. The judicious use of debt can make a company more profitable and give higher returns to equity shareholders. Excessive use of financial leverage (debt=leverage) can lead to disaster and the breakup of the firm. We have discussed why it is called *leverage*. Just as a lever can allow you to lift a greater weight than you could straight on, thereby multiplying your strength, the use of debt can allow a company to do more than it could with just its own capital alone. But leverage works both ways -- just as it can multiply return when properly used, it can multiply losses when things don't go as planned. We have also discussed about the types of leverages and their implications.

6.6 Self Assessment Questions/ Problems

1. What is meant by the term 'leverage'?
2. Explain the relationship between the types of leverages and income statements.
3. What is operating leverage? What causes it?
4. How is the degree of financial leverages measured?
5. MK & Co. has sales of Rs.1 lakh . The variable costs are 40% of the sales while the fixed operating costs amount to Rs.30, 000 .The amount of interest on long-term debt is Rs.10, 000. You are required to calculate the composite leverage and illustrate its impacts if sales are increase by 6%.
6. KBS Limited has sales of Rs.10,00,000, variable cost Rs. 700,000 and fixed costs of Rs. 200,000 and a debt of Rs.500,000 at 10 per cent rate of interest. Compute the operating, financial and total leverages.

6.7 References and Further Readings

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2. Khan and Jain, Financial Management (text, Problems, and cases), 5th Edition, Tata McGraw Hills Limited, New Delhi.
3. Prasanna Chandra, Financial Management, 5th Edition, Tata MaGraw Hills Limited, New Delhi.
4. Lawrence J Gitman, 2001, Principles of Managerial Finance, 9th Edition, Pearson Education Asia.
5. Sharma and Sasi K Gupta, Financial Management, Kalyani Publishers.
6. Chandra Bose D, 2006, Fundamentals of Financial Management, 1st Edition, Prentice-Hall of India Private Limited, New Delhi.

6.8 Answers for the Test of understanding

Test of understanding-1 Q4 = 1.3; 1.7; 2.7

Test of understanding- 2

Q3 = P ltd., Q ltd.,

- | | | |
|----------|-----|------|
| 1). OL | 2 | 2.33 |
| 2). FL | 1.6 | 1.6 |
| 3). CL 3 | 3.6 | |

Chapter - 7
WORKING CAPITAL MANAGEMENT

- 7.0 Introduction
- 7.1 Learning Objectives
- 7.2 Concepts of working capital
- 7.3 Types of working capital
- 7.4 Components of working capital
- 7.5 Importance of working capital
- 7.6 Determinants of working capital
- 7.7 Need for working capital
- 7.8 Estimation of working capital
- 7.9 Sources of working capital
- 7.10 Summary
- 7.11 Self Assessment Questions/Problems
- 7.12 References and Further Readings

7.0 Introduction

Every business unit (irrespective of size and nature of business) needs funds to meet its long term and short-term requirements. Funds invested in fixed assets which remain in use for a longer period is called “long term funds’ or ‘Fixed Capital’. A business unit also needs funds for short-term purposes to finance its current operations. Investment in short term assets like cash, inventories, debtors etc., is called ‘Short-term Funds’ or ‘Working Capital’. Thus ‘Working Capital’ can be described as funds needed for carrying out the day-to-day operations of the business smoothly. The management of working capital is equally important as the management of long-term financial investment, because the underlying decision criteria are the same. But working capital management gives an increased focus on liquidity. The major difference between these two is with regard to quantum and frequency of cash flows.

You can see in any organization that the finance managers are devoting much of their time for working capital management. Why? Every business needs adequate amount of working capital. Even a business with which is fully equipped with all types of fixed assets required for its business operations are bound to collapse with out

- (i) An adequate supply of raw materials for the smooth production processing;
- (ii) Availability of sufficient amount of cash to pay for wages, power and other costs on due time;
- (iii) creating a stock of finished goods to meet the market demand regularly; and,
- (iv) The ability to grant credit to its customers.

All these require optimal amount of working capital. An effective and efficient utilization of fixed assets is possible when the company has adequate amount of working capital. Hence, Working capital is the lifeblood of a business. The business unit will not be able to carry on its day-to-day activities without the availability of adequate amount of working capital. Let us discuss about working capital decisions in detail.

7.1 Learning Objectives

After reading this chapter, you should be able to:

1. understand the concepts , components and characteristics of working capital
2. understand the concepts of operating cycle
3. understand the importance and how the various factors influence the working capital requirements
4. understand the various methods of estimating the working capital

7.2 Concepts of working capital

What is working capital? There is no clear definition of working capital. Still the debate is going on in this area. You can understand the meaning of working capital in two different and interlinked sense.

- a. **Gross working capital:** It refers to the amount invested by the company in current assets. Current assets are the assets which can be converted into cash within one accounting period (say a year).
- b. **Net working capital:** It refers to the difference between the current assets and current liabilities. In simple words, it refers to the excess of current assets over current liabilities. Current liabilities are the liabilities which are expected to mature within one accounting period (say a year).

7.3 Types of working capital

On the basis of period, we can be classified into two types:

1. **Permanent or core working capital:** It represents that part of the amount which is locked up permanently to run the business smoothly. Example of such assets are raw materials, work-in-progress, finished goods which are required for meeting the regular demand of the company.
2. **Temporary or fluctuating or variable working capital:** It keeps fluctuating from time to time on the basis of its business activities or it depends on the volume of production. For example, additional raw materials are required for meeting the demand during the peak period.

7.4 Components of working capital

We can describe the components of working capital is based on the net concept of working capital which is applicable to all types of manufacturing industries. The components of working capital are shown in table 7.1.

Table 7.1

Components of working capital

| Current Liabilities | Current Assets |
|---------------------------------|---|
| 1. Trade Creditors | 1. Inventory (Raw materials, work-in-process, finished goods, and spares) |
| 2. Bills Payable | 2. Cash/Bank balance |
| 3. Bank Overdraft | 3. Bills Received |
| 4. Outstanding Expenses | 4. Debtors |
| 5. Loans (Short Term Only) | 5. Prepaid Expenses |
| 6. Provision for doubtful debts | 6. Accrued Income |
| 7. Provision for Taxation | 7. Investments (short term) |
| 8. Proposed dividend | 8. Advance Payments |
| | 9. Marketable Securities |
| | 10. Unexpired Insurance |

7.5 Importance of Working Capital

Working capital is the life-blood and nerve centre of a business firm. As a finance manager, you cannot run your business effectively without a sufficient (quantity) amount of working capital. It is critical to maintain a right level of working capital and it is your responsibility to decide the optimal amount of working capital. Imagine that your company has ample working capital. You are in a position to avail advantages of any favorable opportunity either to buy additional quantities of raw materials or to implement a special order or to wait for enhanced market status and so on.

The important items of working capital such as the amount of debtors, creditors, inventory and cash balance are considered as the sign of a business's efficiency and financial strength. For instance, Cash is needed to carry out the day-to-day workings and buy inventories etc. The shortage of cash may badly affect the liquidity position of a business concern. The receivables management is related to the volume of sales and amount debtors. For escalating sales there may be a need to offer additional credit facilities. While sales may ascend but

the danger of bad debts and cost involved in extending credit may have to be considered against the benefits. Inventory control is also a significant constituent in working capital management. The deficiency of inventory may cause work stoppage. On the other hand, surplus inventory may result in blocking of money in stocks. The overall success of the company depends upon its working capital position. So, it should be handled properly because it shows the efficiency and financial strength of a company.

In addition to this, while planning for working capital; you should keep in mind two danger points' i.e excessive and inadequate positions. Investment in current assets needs to be adequate as it affects the profitability, solvency and liquidity position of a company. From the above discussion it is clear that managing working capital requires the consideration of its features such as short life span and swift transformation into other form of current assets, because these characteristics have the following implications of the company:

1. Decision regarding management of working capital has to be taken frequently which are repetitive in nature.
2. Components of working capital are closely related to profitability and mismanagement of any one component may adversely affects the other components and operating results of the company.
3. The difference between the present value and book value of profit is not significant.

Test of Understanding - 1

1. Describe the concept of working capital?
2. Can you mention the types of working capital? Yes/ No
3. Can you give any two reasons for the importance of working capital decisions to the company? Yes/No
4. Can you recall the components of working capital? Yes/No
5. Can you state the characteristics of working capital? Yes/No

7.6 Determinants of working capital

The working capital needs of a business concern are influenced by various factors. Let us discuss these factors one by one in brief:

- 1. Nature of Business:** The nature and volume of the business and the working capital requirements are interlinked. For example, a manufacturing industry has a long cycle of operation of the working capital; the same would be short in the business involved in providing services. Thus, the amount of working capital required varies as per the nature of business; the business unit which is involved in manufacturing

a product would require more working capital than that of a business operating in the service sector.

2. **Manufacturing/Production Policy:** Each business in the manufacturing sector has its own production policy. For example, one may follow the policy of uniform production even if the demand varies from time to time, and others may follow the principle of 'demand-based production' in which production is based on the demand prevailing during that particular phase of time. Accordingly, the working capital requirements vary for both of them.
3. **Seasonal Variations/ Operations:** The requirement of working capital fluctuates for seasonal businesses. The working capital needs of such businesses may increase considerably during the busy season and decrease during the slack season. Ice creams and soft drinks have a great demand during summers, while in winters the sales are negligible. During peak season, Oil and sugar mills require larger amount of working capital in order to purchase the raw materials in larger quantities. Such companies have to plan for their working capital according to the seasonal requirements (demand).
4. **Market Condition:** The degree of competition prevailing in the market has an important role in determining the working capital needs of a company. If there is high level of competition in the chosen product category, you have to keep more inventory of finished goods to meet the demand, for which the working capital requirement will be high. On the contrast, if there is no competition or less competition in the market then the working capital requirements will be low.
5. **Availability of Raw Material:** If raw material is readily available then you need not maintain a large stock of the same, thereby reducing the working capital investment in raw material stock. On the other hand, if raw material is not readily available then large inventory/stock pile up needs to be maintained by the firm which calls for substantial investment in the same.
6. **Growth and Expansion:** Growing business unit needs a larger amount of working capital than those that are static. Normally, the need for increased working capital funds precedes growth in business activities.
7. **Price Level Changes:** Generally, you should anticipate the effect of price level changes on working capital. Generally, rising price level requires a higher investment in the working capital because the firm needs higher investments in order to maintain the same level of current

assets. However if you revise your product prices, the firm may not face severe working capital problem.

8. **Manufacturing Cycle:** The manufacturing cycle starts with the purchase of raw material and ends with the production of finished goods. If the manufacturing cycle involves a longer period, the need for working capital would be more and vice versa.
9. **Other Factors:** In addition to the above considerations, there are a number of other factors which affect the working capital requirements of a company. They are given below:
 - a. Terms of sales and purchases
 - b. Cyclical changes in the economy
 - c. Changes in technology
 - d. Dividend policy
 - e. Business cycle fluctuations

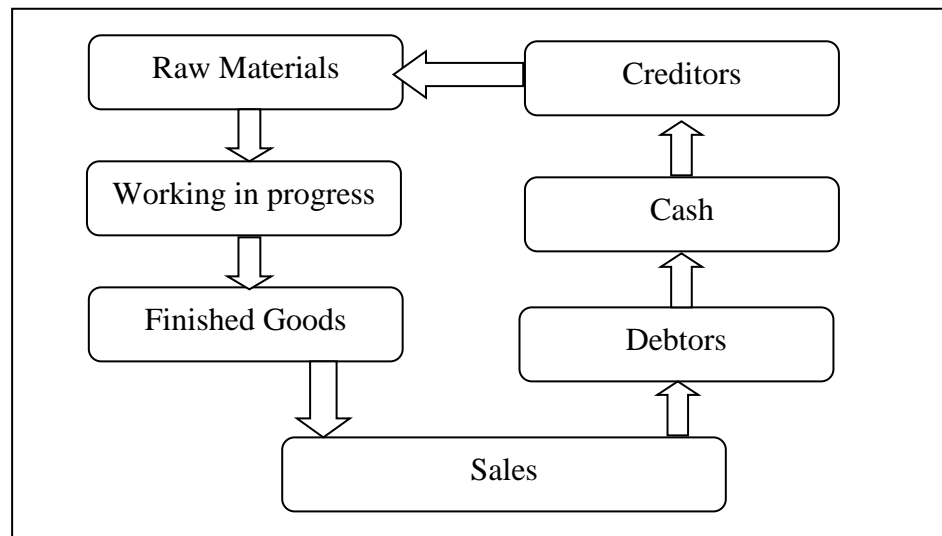
7.7 NEED FOR WORKING CAPITAL

Working capital is the life of blood of a business. Every business needs some amount of working capital irrespective of its size and nature. We have discussed the list of current assets in the previous section where we have stated current assets can be easily converted into cash. Besides, there is a time gap. For example, there are time gaps between purchase of raw materials and production; production and sales; sales and realisation of cash. You cannot start the production process until the cash is realised (collected from debtors). The company needs some amount of cash to make continuous production or to fill the gap. Thus, working capital is needed for the following purposes:

- a. For the purchase of raw materials, components and spares.
- b. To pay salaries, wages and other expenses
- c. To provide credit facilities to the customers
- d. To maintain the safety stock levels

From the above, it is clear that there is a time gap between production and realisation of cash. This time gap is technically termed as “operating cycle or working capital cycle” of the business. The operation cycle of a manufacturing business concern is given below:

Figure 7.1
Operating cycle



How is the length of operating cycle determined?

The length of operating cycle of a manufacturing company is the sum of :

- a. **Inventory conversion period:** It refers to the time needed for purchasing raw materials and keeping ready for the product on processes. Typically, it includes:
 - i. Raw Materials conversion Period (RMCP)
 - ii. Work-in-process conversion period (WIPCP)
 - iii. Finished goods conversion period (FGCP)
- b. **Debtors' conversion period (DCP):** It refers to the time required to collect the outstanding amount from our customers (debtors) who purchased our products on credit.

The total of inventory conversion period and debtors' conversion period is referred to as Gross Operating Cycle (GOC).

- c. **Payable deferral Period (PDP):** It refers to the time taken to pay the outstanding amount to our suppliers (creditors).

The difference between the GOC and PDP is described as Net Operating Cycle (NOC) or Cash Conversion Cycle (CCC).

Let us understand the computation of the length of operating cycle.

Example 7.1

Victory Ltd.'s Profit and Loss A/c and Balance Sheet for the year ended 31.03.2008 are given below. You are required to calculate the operating cycle.

TRADING AND PROFIT AND LOSS ACCOUNT for the year ended
31.03.2008

| Particulars | Rs. | Particulars | Rs. |
|-------------------------------|----------|---------------------|----------|
| To Opening Stock: | | By Credit Sales | 1,00,000 |
| Raw materials | 10,000 | By Closing Stock: | |
| Work-in-progress | 30,000 | Raw materials | 11,000 |
| Finished goods | 5,000 | Work-in-progress | 30,500 |
| | 35,000 | Finished goods | 8,500 |
| To Credit Purchases | 15,000 | | |
| To Wages & Manufacturing exp. | 55,000 | | |
| | ----- | | |
| To Gross Profit c/d | 1,50,000 | | ----- |
| | 15,000 | | 1,50,000 |
| | 10,000 | | ----- |
| To Administrative exp. | 30,000 | By Gross Profit b/d | 55,000 |
| To Selling and Dist. Exp. | ----- | | |
| | 55,000 | | ----- |
| To Net Profit | | | 55,000 |

BALANCE SHEET as at 31.03.2008

| Liabilities | Rs. | Assets | Rs. |
|-------------------------------|----------|------------------|----------|
| Share Capital (16,000 equity) | 1,60,000 | Fixed assets | 1,00,000 |
| shares of Rs.10 each) | 30,000 | Closing Stock: | |
| Profit and Loss Account | 10,000 | Raw materials | 11,000 |
| Creditors | | Work in Progress | 30,500 |
| | | Finished goods | 8,500 |
| | | Debtors | 30,500 |
| | | Cash and Bank | 19,500 |
| | ----- | | ----- |
| | 2,00,000 | | 2,00,000 |

Opening debtors and Opening creditors were Rs.6,500 and Rs.5,000, respectively.

Solution:

Calculation of Operating Cycle:

1. Raw material

$$\begin{array}{r} \text{Average or closing Raw Material} \quad 10,500 \\ \hline \text{Raw Material Consumed} \quad 34,000 \\ \hline \end{array} \quad \begin{array}{l} \text{x 365} \\ = \\ \text{x 365} \end{array} \quad \begin{array}{l} \text{= 113 Days} \end{array}$$

Where, Average Raw Material = $(10,000 + 11,000) / 2 = 10,500$

Raw material consumed = $10,000 + 35,000 - 11,000 = 34,000$

2. Work-in-progress

$$\begin{array}{r} \text{Closing or Average Work- in-progress} \quad 30,250 \\ \hline \text{Total Cost of Production} \quad 48,500 \\ \hline \end{array} \quad \begin{array}{l} \text{x 365} \\ = \\ \text{x 365} \end{array} \quad \begin{array}{l} \text{= 228 Days} \end{array}$$

Where, Average Work-in-progress = $(30,000 + 30,500) / 2 = 30,250$

Total Cost of Production = $30,000 + 34,000 + 15,000 - 30,500 = 48,500$

3. Finished Goods

$$\begin{array}{r} \text{Closing or Average Stock} \quad 6,750 \\ \hline \text{Cost of Goods sold} \quad 45,000 \\ \hline \end{array} \quad \begin{array}{l} \text{x 365} \\ = \\ \text{x 365} \end{array} \quad \begin{array}{l} \text{= 55 Days} \end{array}$$

Where, Average Stock = $(5,000 + 8,500) / 2 = 6,750$

Cost of Goods sold = $5,000 + 48,500 - 8,500 = 45,000$

4. Debtors

$$\begin{array}{r} \text{Average Debtors} \quad 18,500 \\ \hline \text{Credit Sales} \quad 1,00,000 \\ \hline \end{array} \quad \begin{array}{l} \text{x 365} \\ = \\ \text{x 365} \end{array} \quad \begin{array}{l} \text{= 67 Days} \end{array}$$

Where, Average Debtors = $(6,500 + 30,500) / 2 = 18,500$

Credit Sales = Rs.1,00,000 (Given)

Gross operating cycle is : 113 days + 228 days + 55 days + 67 days = 463

5. Creditors

$$\frac{\text{Average Creditors}}{\text{Credit Purchases}} \times 365 = \frac{7,500}{35,000} \times 365$$

= 78 Days

Where, Average Creditors = $(5,000 + 10,000) / 2 = 7,500$

Credit Purchases = Rs.35,000 (Given)

Net Operating Cycle is:

Total Days - Credit allowed by Creditors

= 113 days + 228 days + 55 days + 67 days - 78 days

= 385 Days

Test of understanding- 1

1. Can you explain how sales and technology and production affect the working capital requirements of a company?
Yes/No
2. Can you state how inflation and size of the business affect the working capital requirements of a company?
Yes/No
3. Can you define the concept of operating cycle?
Yes/No
4. State the difference between the net and gross operating cycle?

7.8 Estimating Working Capital Requirements

Estimation of working capital requirement is a challenging task. As a finance manager, you have to consider the various factors before estimating the working capital requirements so that the activities get disturbed. Let us discuss the process of computation of working capital requirement under operating cycle method: (this method is used widely).

Example 7.2

Prepare an estimate of working capital requirements from the following information of a trading concern.

- | | |
|---|---------------|
| a. Projected annual sales | 100,000 units |
| b. Selling Price | Rs.8 per unit |
| c. Percentage of net profit on sales | 25% |
| d. Average credit period allowed to customers | 8 weeks |
| e. Average credit period allowed by suppliers | 4 weeks |

- f. Average stock holding in terms of sales requirements 12 weeks
 g. Allow 10% contingencies.

Solution:

Statement of working capital requirements

| Particulars | Amount in Rs. |
|---------------------------|---------------|
| Current Assets: | |
| Stock | 92,308 |
| Debtors | 138,462 |
| | 230,770 |
| Less: Current Liabilities | |
| Creditors | 46,154 |
| Net working capital | 184,616 |
| Add: 10% Contingencies | 18,462 |
| Working capital required | 203,078 |

Workings:

1. Cost of sales:

$$\begin{aligned} \text{Sales} &= 100,000 \times 8 = 8,00,000 \\ \text{Profit} &= 8,00,000 \times 0.25 = 2,00,000 \\ \text{Cost of sales} &= 6,00,000 \end{aligned}$$

2. Stock:

$$\begin{aligned} &= [\text{cost of sales} \div \text{No of weeks in a year}] \times \text{No. of holding weeks} \\ &= [600,000 \div 52] \times 12 = 138,462 \end{aligned}$$

3. Debtors:

$$\begin{aligned} &= [\text{cost of sales} \div \text{No of weeks in a year}] \times \text{No. of credit weeks} \\ &= [600,000 \div 52] \times 8 = 92,308 \end{aligned}$$

4. Creditors

$$\begin{aligned} &= [\text{cost of sales} \div \text{No of weeks in a year}] \times \text{No. of credit weeks} \\ &= [600,000 \div 52] \times 4 = 46,154 \end{aligned}$$

5. As it is a trading concern, cost of sales are assumed to be the purchases
 6. Profits have been ignored as funds provided by the company may or may not be used as working capital
 7. You may calculate the debtors on sales value. But it is reasonable to calculate based on cost of sales (refer point 6)

Example 7.3

The cost sheet of PQR Ltd. provides the following data:

| | Cost per unit |
|---|---------------|
| Raw material | Rs.50 |
| Direct Labour | 20 |
| Overheads (including depreciation of Rs.10) | 40 |
| Total cost | 110 |
| Profits | 20 |
| Selling price | 130 |

1. Average raw material in stock is for one month.
2. Average material in work-in-progress is for half month.
3. Credit allowed by suppliers: one month; credit allowed to debtors: one month.
4. Average time lag in payment of wages: 10 days;
5. average time lag in payment of overheads 30 days
6. 25% of the sales are on cash basis.
7. Cash balance to be maintained at Rs.1,00,000
8. Finished goods lie in the warehouse for one month.

You are required to prepare a statement of the working capital needed to finance a level of the activity of 54,000 units of output. Production is carried on evenly throughout the year and wages and overheads accrue similarly. State your assumptions, if any, clearly.

Solution:

As the annual level of output is given at 54,000 units, it means 'that the monthly turnover would be $54,000/12 = 4,500$ units. The working capital requirement for this monthly turnover can be estimated as follows:

Note: If you would like to convert the same into weekly basis then, you have to divide by 52 week. (Similarly for requirements you need to divide the annual output by 360 or 365 days or number of working days in the year.)

Estimation of Working Capital Requirement

| | Amount Rs.) | Amount (Rs.) |
|---|------------------|------------------|
| I. Current Assets: | | |
| Minimum Cash Balance | 1,00,000 | |
| Inventories: | | |
| Raw Materials (4,500 x Rs.50) | 2,25,000 | |
| Work-in-progress: | | |
| Materials (4,500 x Rs.50)/2 | 1,12,500 | |
| Wages 50% of (4,500 x Rs.20)/2 | 22,500 | |
| Overheads 50% of(4,500 x Rs.30)/2 | 33,750 | |
| Finished Goods ((4,500 x Rs.100) | 4,50,000 | |
| Debtors (4.500 x Rs.1 00 x 75%) | 3,37,500 | |
| | 12,81,250 | |
| Gross Working Capital | | 12,81,250 |
| II. Current Liabilities: | 2,25,000 | |
| Creditors for Materials (4,500 x Rs.50) | 30,000 | |
| Creditors for Wages (4,500 x Rs.20)/3 | 1,35,000 | |
| Creditors for Overheads (4,500 x Rs.30) | 3,90,000 | |
| Total Current Liabilities | | 3,90,000 |
| Net Working Capital | | 8,91,250 |

Working Notes:

1. The Overheads of Rs. 40 per unit include a depreciation of Rs. 10 per unit, which is a non-cash item. This depreciation cost has been ignored for valuation of work-in-progress, finished goods and debtors. The overhead cost, therefore, has been taken only at Rs.30 per unit.
2. In the valuation of work-in-progress, the raw materials have been taken at full requirements for 15 days; but the wages and overheads have been taken only at 50% on the consumption that on an average all units in work-in-progress are 50% complete.
3. Since, the wages are paid with a time lag of 10 days; the working capital provided by wages has been taken by dividing the monthly wages by 3 (assuming a month to consist of 30 days).

7.9 Sources of Working Capital Finance

We have discussed above, the procedure to determine the level working capital of a business unit, after that the finance manager has to decide how the working capital requirements will be financed. While determining the sources or structure of working capital finance, he considers factors such as reasonable cost, time and favourable terms. For the convenience of study, the sources of working capital may be classified under the three heads:

Long Term/ Regular working Capital

1. Issue of shares
2. Issue of Debentures
3. Retained Earnings
4. Sales of fixed Assets
5. Security from employees & from customers
6. Term Loans
7. Public Deposits

Short term or Seasonal Working Capital

1. Internal

- a. Depreciation
- b. Provision for Taxation
- c. Accrued Expenses

2. External

- a. Trade Credit
- b. Credit papers
- c. Bank Credit
- d. Government Assistance
- e. Loan from Managing Director or Directors
- f. Loan from Indigenous bankers

Spontaneous sources

1. Trade creditors
2. Bills/Notes Payable and others

7.10 Summary

In this chapter, we have discussed about the working capital decisions and its characteristics. We have also discussed need for working capital, the sources of working capital and the factors determining working capital requirement of a firm and its estimation.

7.11 Self Assessment Questions / Problems

1. Define working capital.
2. Define operating cycle.
3. State the importance of working capital for a manufacturing company?
4. Discuss the types of working capital?
5. Briefly explain factors that determine the working capital needs of a company?
6. Explain the difference between gross and networking capital.
7. State the difference between fixed and flexible working capital.
8. How is working capital affected by the nature of business?
9. Briefly discuss the various sources of funding working capital requirements of a business concern.
10. State the reasons for studying the working capital management as a separate area in financial management.
11. Calculate the amount of working capital requirement for SRCC Ltd. from the following information:

| | Rs. (Per Unit) |
|---------------|----------------|
| Raw material | 160 |
| Direct labor | 60 |
| Overheads | 120 |
| Total cost | 340 |
| Profit | 60 |
| Selling price | 400 |

- a. Raw materials are held in stock on an average for one month. Materials are in process on an average for half-a-month. Finished goods are in stock on an average for one month.
 - b. Credit allowed by suppliers is one month and credit allowed to debtors is two months. Time lag in payment of wages is 1½ weeks. Time lag in payment of overhead expenses is one month. One fourth of the sales are made on cash basis.
 - c. Cash in hand and at the bank is expected to be Rs.50,000 and expected level of production amounts to 1,04,000 units for a year of 52 weeks.
You may assume that production is carried on evenly throughout the year and a time period of four weeks is equivalent to a month.
12. You are required to prepare a statement showing the working capital needed to finance a level of annual activity of 52,000 units of output. The following information are available:

| Elements of cost | Rs. per unit |
|------------------|--------------|
| Raw materials | 8 |
| Direct labour | 2 |
| Overheads | 6 |
| Total cost | <u>16</u> |
| Profit | 4 |
| Selling price | <u>20</u> |

Raw materials are in stock, on an average for 4 weeks. Materials are in process, on an average, for 2 weeks. Finished goods are in stock, on an average, for 6 weeks. Credit allowed to customers is for 8 weeks. Credit allowed by suppliers of raw materials is for 4 weeks. Lag in payment of wages is 1½ weeks. It is necessary to hold cash in hand and at bank amounting to Rs. 75,000. It may be noted that production is carried on evenly during the year and wages and overheads accrue similarly.

7.12 References and Further Readings

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Chapter - 8
Components of Working capital management

- 8.0 Introduction
- 8.1 Learning Objectives
- 8.2 Facets of Cash Management
 - 8.2.1 Motives for holding cash
 - 8.2.2 Strategies of cash management
- 8.3 Facets of Receivables Management
 - 8.3.1 Credit policy Variables
 - 8.3.2 Credit Evaluation
 - 8.3.3 Monitoring Receivables
- 8.4 Facets of Inventory Management
 - 8.4.1 Reasons for holding inventories
 - 8.4.2 Objectives of inventory management
 - 8.4.3 Techniques of Inventory control
- 8.5 Summary
- 8.6 Self Assessment Questions
- 8.7 References and Further Readings

8.0 Introduction

Working capital is very essential for the success of a business concern, because the accomplishment of the prime objective i.e. maximisation of profits by a business concern depends largely on how its working capital is managed. Therefore, every firm needs efficient management and control over the components of working capital. Working capital management includes deciding the optimum level of investments in current assets, optimal mix of short term funds in relation to long term funds and locating the appropriate means (sources) of short term financing. In the previous chapter 7 (working capital management-an overview), you have come across the concept of working capital and how it can be determined and financed. Now let us come to the parts of working capital viz., cash, receivables and inventory management. The management of working capital has been discussed under the following three heads in this chapter:

- a. Management of cash balances
- b. Management of accounts receivables
- c. Management of inventory

8.1 Learning Objectives

After reading this chapter, you should be able to:

1. Understand the meaning of cash and why it should be managed.
2. Understand the concept and various aspects of receivables management.
3. Understand the objectives, techniques and control of inventory management.

8.2 Facets of Cash Management

Cash is the most liquid current asset of all and is vital for existence of any business firm. Cash is required by a firm in order to meet its day to day requirements. Though the proportion of current assets to be held in the form of cash is normally very small, its effective management is crucial to the solvency of the business because as we all know that cash is the central point of the funds flows in a business. The goal of cash management is to reduce the amount of cash that is being used within the firm so as to increase profitability, but without reducing business activities or exposing the company to undue risk in meeting its financial obligations. Generally cash management is concerned with the following:

- a. Cash flows into & out of the firm

- b. Cash flows within the company
- c. Cash balances held by the company at a point of time by financing deficit or investing surplus cash

Let us discuss first the motives for holding cash and then move on to strategies of cash management.

8.2.1 Motives /Reasons of Holding Cash

There are four motives for holding cash

- a. **The transaction Motive:** It means maintaining cash for the purpose of meeting the cash needs arising in the ordinary course of doing business. It includes regular payments like wages, acquisition of fixed assets and inventories and so on. Note that the amount of cash needed for transaction requirements depends on the nature and size of the business and it varies from industry to industry.
- b. **The precautionary Motive:** This refers to maintaining cash as buffer for meeting the unexpected contingent requirements that may arise in the business. A company either hold cash or marketable securities (which are easily convertible into cash).
- c. **The Speculative Motive:** This refers to holding cash for gaining from potential profit making situation. For instance, a firm may purchase raw materials in bulk in anticipation of a rise its price and if the price rises, the firm may sell the excessive purchased units in order to book profits.
- d. **The Compensative Motive:** Here a firm hold cash for compensating the bank for availing its services.

8.2.2 Strategies of cash management

The following are the strategies:

- a. Cash planning
- b. Managing the cash flows
- c. Optimum cash level
- d. Investing surplus cash

All these strategies are discussed in the following paragraphs:

A. Cash Planning

This is the central point of all finance functions. It is one of the primary activities of a finance manager; a company has to maintain an adequate amount of cash. Both the excess or inadequate cash balance are dangerous to the company. Cash planning is necessary in order to maintain optimal level of cash balance. Cash planning refers to the forecast of the cash needs of a company for a given period with a view

to maintaining optimum cash balance to meet the payment obligations as and when they mature [It may be done on daily, weekly, or monthly basis]. Cash budget is an important tool for planning and controlling cash requirements of a business concern.

Cash forecasting and Budgeting: Cash budget is the most important as well as analytical device which is used to estimate the flow of cash (cash receipts & payments) in any business over a period of time. In simple words, cash budget is a summary statement of the firm's expected cash inflows & outflows over a projected time period. Cash forecasts are needed to prepare cash budgets. Cash forecasting may be done on short or long term basis. The following are the Short-term forecasting methods (covering periods of one year)

- a. ***The receipts & disbursement method (week or a month):*** The cash flows can be compared with the budgeted income & expense items in this method. The sources and uses of cash flows can be identified as below:

Operating: cash sales, collections from customers and operating cash expenses.

Non-operating: sale of old assets, dividend, interest income and non operating cash expenses

Financial: when internally generated cash flows are not sufficient, the firm resorts to external sources such as borrowing & issuance of securities. Similarly a firm may repay its term loans at the maturity period.

- b. **The Adjusted Net Income Method:** It involves tracing of the working capital flows. It is also called as the sources & uses approach. The Objectives of this approach can be: To project the company's need for cash at a future date and to show whether the company can generate the required funds internally & if not, how much it will have to mobilize externally i.e. borrow from financial institutions or banks or raise funds in the capital market.

B. Ways to Manage Cash: A company can manage cash virtually in its all areas of operations that involve the usage of cash. The goal is to receive cash as soon as possible while at the same time deferring payments as long as possible. The two objectives in managing cash flows are:

1. Accelerate cash collections as soon as possible
2. To decelerate or to delay cash disbursements as long as possible

a. Accelerating Cash Collections: As a finance manager, it is your responsibility to accelerate the cash inflows in order to meet your obligations in time. The time gap between the receipt of cheque from the customer and its collection is called *collection or deposit float*. This includes delays in mailing time of cheques i.e. the time taken by the cheque in transit (postal delay) and the processing time i.e. the time taken by the firm in processing the cheque for internal accounting purposes. This also depends on the processing time taken by the banks as well as the inter bank system to get credit in the desired account. The greater the firm's deposit float, the longer the time taken in converting cheques into usable funds. Attempt should be made to reduce the firm's deposit float by speeding up the mailing, processing & collection times. Therefore you need to answer, How much time does it take receipts (collection of cheques) and How to accelerate cash collections?

Possible solutions:

1. Decentralized collections centres
2. Lock-box system
3. Persuading Prompt payment by Customers
4. Early conversion of payment (cheque) into cash

Ways to Improve Collection of Cash?

A. Changing Customer Paying Habits through

1. Letters, telephone calls, or personal visits
2. Economic incentive for paying bills faster; (offer of discounts)

B. Improve the Delivery system (reduce the negative float)

1. Regional banking (customers pay bills to banks since they can transfer funds more quickly than mail order delivery).
2. Lockbox collection system (The firm rents a post office box in a particular city and the bank monitors the lockbox periodically).
3. Electronic communications (i.e., data-phone wire systems).

How to control disbursements?

- There is no advantage in paying sooner than agreed. By delaying payments much as possible, the firm makes maximum use of trade credit as a source of funds- a source which is interest free (trade credit is also known as spontaneous sources of finance)
- **Disbursement or payment float:** It is defined as the difference between the book balance and the bank balance of an account. For example, assume that you have a balance of Rs. 5000 in your account. As a current account holder, you receive no interest on the balance (Rs. 5000). Now assume that

you have received your Telephone bill by mail and it is Rs.1000. You write a cheque for Rs. 1000 and mail it to the telephone service provider. If you record this payment in your bank register. It reduces the book value of the account to Rs. 4000. But your bank account still has a balance of Rs.5000. because the cheque will literally be “in the mail” for a few days before it is received by the telephone service provider and may go several more days before the telephone company en-cashes it. There is a time lag between the moment you write the cheque and the time the bank cashes the cheque. There is a difference in your book balance and the bank balance. That difference is known as payment float. This float can be managed. If you know that the bank will not pay the cheque for five days, you could take Rs.1000 from your current account and invest it in your savings account at the same bank for these five days and then place it back into your current account on the 5th day (“just in time”) to cover the Rs.1000 cheque.

C. Determining the Optimum Cash Balance under certainty:

1. Optimum Cash balance under certainty: Baumol’s Model

This model considers cash management similar to inventory management’s problem.

Assumptions of Baumol’s Model:

1. The firm is able to forecast its cash need with certainty
2. The firms’ cash payments occur uniformly over a period of time
3. The opportunity cost of holding cash is known and it does not change over a period of time
4. The firm will incur the same transaction cost whenever it converts its securities to cash.

Limitations of Baumol’s model

Companies in practice do not use their cash balance uniformly nor are they able to predict daily cash inflows and outflows.

2. Optimum Cash Balance under uncertainty: the Miller-Orr Model

The Miller-Orr Model overcomes the shortcomings present in the Baumol’s model. It assumes that net cash flows are normally distributed with a zero value of mean & standard deviation. The Miller Orr model provides for two control limits –the upper control limit & the lower control limit as well as the return point .If the firm’s cash flow fluctuate randomly and hit the upper limit, then it buys sufficient marketable securities to come back to a normal level of cash balance (return point). Similarly, when the firm’s cash flows

wander and hit the lower limit, it sells sufficient marketable securities to bring the cash balance back to the normal level (return point).

D. Types of Short-Term Investment Opportunities: The Company has the following short term investment opportunities in India.

Treasury Bills: It is a short-term government security. Generally, they are sold at a discount to their face value and redeemed at par on maturity. The difference is the return on security. They can be bought & sold any time; thus they have liquidity and do not have the default risk.

Commercial papers: It is a short-term, unsecured securities issued by highly creditworthy large companies. They are issued with a maturity of three months to one year.

Certificates of deposits: Certificate of deposits is issued by banks acknowledging fixed deposits for a specific period of time issue papers. They are negotiable instruments that make them marketable securities.

Bank deposits: A firm can deposit its temporary cash in a bank for a fixed period of time. The interest rate depends on the maturity period and the prevailing market rate of interest.

Inter corporate deposit: Those companies having surplus cash can deposit its funds in a sister or associate or other companies with high credit standing.

Money Market Mutual Fund: MMMF invest in short term marketable securities which have a minimum lock in period of 30 days and returns are usually higher than the bank deposits with the same maturity period.

Test of Understanding - 1

- 1 Can you remember the motives for holding cash balance? Yes/No
- 2 Can you recall the ways to improve cash collections? Yes/No
- 3 Can you remember the various options for investing surplus cash?
Yes/No
- 4 Can you recall the models that determine the optimum cash balance?
Yes/No

8.2.3 Facets of Receivables Management

One of the very important components of working capital is receivables. You may know it very well that selling goods on credit is the order of the day. When a firm sells goods or services on deferred payment basis, it is said that the firm has granted credit to its customers who is described as accounts receivables. It has three characteristics: it involves ascertain element of risk, it is based on economic value and the cash payment or equivalents will be received in future. The average balance in the receivables account would approximately be; average daily credit sales multiplied by average collection

period. For example, if the average daily collection period were 40 days, and the average credit sales is Rs 1, 20,000, then the receivables account would be Rs. 4, 80,000 (i.e 40 x 120,000). Hence receivable often account for a significant proportion of the total assets.

Why should a company sell goods on credit or what is the purpose of Receivables?

The purpose of selling goods on credit is directly connected to the basic objective of the firm. The objectives of receivables management are as follows:

- **Increasing the sales:** If a company sells goods on credit, it can sell more goods than if it insists on immediate cash payment.
- **Increasing profits:** Increase in sales lead to increased profits because companies charge a higher margin (of profit) on credit sales as compared to cash sales.
- **Facing Competition:** Due to competition, a company may be compelled to offer credit facilities which act as its competitive edge in the market.

So this is the purpose of receivables, now you will agree with me that a firm does incur some cost on receivables, let us discuss the costs.

Cost of maintaining Receivables

- **Cost of Capital on additional fund requirement:** As discussed in previous chapter, there is a time lag between the credit sale to customer and the receipt of cash from them as payment. During this period, to the extent of credit sales the firm's resources are blocked in its receivables. So it has to arrange additional finance to meet its own obligations toward its creditors and employees which are in the form of payments for purchases, salaries to the staff and other production and administrative expenses. This additional requirement of finance is met either from its own resources or from outside and, it involves cost to the firm in terms of interest (if financed from outside) or opportunity costs (if internal resources are used which could have been put to some other use).
- **Administrative costs:** When a company maintains receivables, it has to incur additional administrative expenses in the form of salaries to clerks who maintain records of debtors, expenses on investigating the creditworthiness of debtors etc.
- **Collection costs:** These are costs, which the firm has to incur for the prompt collection of the amount from the customers.

- **Defaulting cost:** When customers make default in payment it increased not only the collection efforts, but the firm may also have to incur losses from bad debts.

So it is easy to compare costs with the benefits & go for the best alternative. Now let us decide on what should be the size of receivables?

The size of receivables or investment in receivables is determined by the firm's credit policy and the level of its sales. The following aspects of receivables management are discussed in this chapter:

- Formulation of credit policy
- Credit evaluation
- Monitoring receivables

8.3.1 Credit Policy Variables

The credit policy of a company should be framed depending on the business environment in which it is operating. While formulating the credit policy, the company should look into the cost of funds for additional investment, cost of bad debts, and incremental profit. Though we may consider the above said variables, in competitive market, the credit policy adopted by a company is considerably influenced by the practices followed by the industry. For instance, you are extending credit period of 15 days and your competitor is following a credit period of 30 days. To cope with your competitor, you have to adopt the same credit period. The term credit policy variable includes the policy of a company in respect of the credit standards adopted, the period over which credit is extended to customers, any incentive in the form of cash discount offered, as also the period over which credit is extended to customers, as also the period over which the discount can be utilized by the customers and the collection effort made by the company. If we group the above components, it can be grouped into four dimensions as mentioned below:

1. Credit standards
2. Credit period
3. Cash discount
4. Collection effort

Credit standards: Usually, as a finance manager, you have to decide the standard to be applied to your customers in deciding whether to extend credit or not and if you decide to extend credit to customers, will it be selective and extend only to low credit risk customers or open to all the customers. Application of very stiff standards for the classification of customers to whom credit can be extended and to whom it cannot be extended is likely to result in a low volume of sales, less amount of money locked up in the form of

receivables, virtually no bad debt losses and less amount to be spent for collection. On the other hand, indiscriminate extension of credit without bothering much about the credit standards expected of the customers is likely to increase sales, more amount of money being locked up in the form of accounts receivable, higher incidence of bad debt losses and which in turn increases expenses on the collection effort. How to make effective credit decisions? For this you may do it on your own or approach any credit rating agencies. For instance, you may classify the customers into four categories ranging from 'high', 'good', 'fair' and 'limited' in the descending order of credit rating. Let us assume that you have been foregoing sales from 'fair' category. Now you have been contemplating to increase your sales from the existing level by liberalizing or relaxing the credit standard to some extent. What course of action should you take: liberalize the credit standard or not? The answer to the question lies in making a comparison of the incremental benefits associated with a liberalized policy and the associated incremental costs.

Credit Period: It refers to the length of time allowed to our customers to pay for their credit purchases. During this period you will not get any interest for the outstanding amount. Normally the credit period varies from 15 to 60 days. Suppose you allow to your customers, say 45 days credit with no discount, then you should state your credit terms as 'Net 45' (meaning the customer will not get any benefit by paying before 45th day but he cannot pay after the 45th day). Lengthening the credit period pushes sales up by inducing existing customers to purchase more units and attracting new customers. At the same time it increases the incidence of bad debts loss. A shortening of credit period will tend to lower sales, as customers may shift to competitors but reduces the incidence of bad debt loss. The effects of increasing the credit period are similar to that of relaxing credit standards.

Cash Discount: I hope that you all are aware about cash discount. Generally a firm offers cash discounts to induce prompt payments (earlier payment) by the customer. Credit terms reflect the Percentage of discount and the period during which it is available. For example the credit terms stated as '2/20, net 45 days' reveals that those making the payment on or before 20th day, will get 2 per cent discount. Else the whole amount is to be paid within 45 days (after 20th day, discount will not be offered). While increasing or decreasing the cash discount, you have to compute the incremental profit. If it is positive you can proceed or drop the proposal.

Collection Effort: The objective of collection policy is to achieve timely collection of receivables. The collection effort consists of the following:

- **Monitoring the state of receivables;**

- **Dispatch of letters to customers whose due date is approaching**
- **Telegraphic and telephonic advice to customers around the due date**
- **Personal visit of salesman or collection personal**
- **Use of collection agencies**
- **Threat of legal action to overdue accounts**
- **Legal action against overdue accounts.**

Very rigorous collection policy might act as an irritant to customers, thereby jeopardizing the good customer relations built over the years. Further, the sales of the company may decline as customers with some overdue may fear to place further orders. However, the amount of receivables and bad debt losses will reduce to a certain extent as the company increases the collection expense associated with collection programs. Therefore while formulating credit policy you have to consider the above factors and manage the receivables in a better manner.

8.3.2 Credit Evaluation

We have discussed all the four aspects of credit policy variables. Now we move into the next part i.e. credit evaluation. Credit evaluation refers to the assessment of the credit risk profile of the customer which is the most important element of credit management. Before granting credit to a customer, it is better to assess him/her properly. Otherwise, you may find the following errors:

| | Sanctioning credit | Not sanctioning credit |
|----------------|--|---|
| Good Customers | Sanctioning credit is the Correct decision | Type I Error |
| Bad Customers | Type II Error | Not sanctioning credit is the correction decision |

Both the Type I & II errors are costly. Type I error leads to loss of profit on sales and loss of good customers. On other hand, type II error leads to bad debts and other costs associated with the bad debts. These errors cannot be eliminated fully but you can minimise through a proper evaluation process.

You may use the "Four C's of Credit" as the guide. We've listed the "Four C's" below.

The "Four C's of Credit" include character, capacity, capital and conditions.

- a. Character

- b. Capacity
- c. Capital
- d. Conditions

The significance of each factor may vary from case to case. The credit executive must measure the account against each factor before giving a final opinion.

In addition to the above, you may use the following quantitative techniques:

- a. Ad Hoc approach
- b. Simple discriminant analysis
- c. Multiple discriminant Analysis

8.3.3 Monitoring Receivables

It is important that a company needs to continuously monitor and controls its receivables. For instance, what is the due date? When we have to send a remainder to the customer? If it is pending for longer period, what is the necessary step to be taken for that?.

Therefore monitoring receivables is an important aspect of receivables management. You can employ several measures for this purpose, as explained below:

- (i) Days sales outstanding
- (ii) Ageing schedule and
- (iii) Collection matrixes

Test of Understanding - 2

1. Can you describe about credit standards? Yes/No
2. Can you explain the effects of stiff versus liberal cash discount policy? Yes/No
3. Can you state the cost associated with receivables management? Yes/No
4. Can you recall the methods of credit evaluations? Yes/No

8.4 Facets of Inventory Management

Inventories are an essential element for any manufacturing organisation. It is very much needed for the smooth production operations (raw materials and work-in process) and for meeting additional sales (finished goods). Therefore a company should maintain optimum level of inventories as it involves more cost (cost of investment, storage, insurance, etc.) and excess inventory will not give any income (interest) to the company. Maintaining appropriate level of inventory requires coordination among the production, purchasing, marketing and finance departments. Decisions related to purchase

of raw material are obtained by the purchase and production department (based on the production policy, purchase department purchase the raw materials), whereas work in process is influenced by production department (depends on the technology, manpower, production cycle and other factors). Finished goods inventory level is decided by both production and marketing department (depends on the demand of the product in the market and available production capacity). Since all these departments end up in consuming resources i.e. funds from the finance department. Hence the finance manager has the responsibility to ensure that the inventories are properly monitored and controlled. *Let us now discuss the nature of inventory management.*

The following are the various forms of inventories which exist in a manufacturing company:

- A. **Raw materials:** It is the basic input which is converted into finished product through the manufacturing process.
- B. **Work-in-process inventories:** It is a semi-manufactured product. They represent products that need more work before they become finished products for sale.
- C. **Finished goods inventories:** it refers to the goods that are completely manufactured products, which are ready for sale. Stocks of raw materials and work-in-process facilitate production, while stock of finished goods is required for smooth marketing operations. Thus, inventories serve as a link between the production and consumption of goods.
- D. **Stores and Spares:** It is required for smooth running of a business unit which do not directly enter into the production activities, but are necessary for production process. Usually, these supplies are small part of the total inventory and do not involve significant investment.

Now the question that arises is, why at all do we need to hold inventory?

8.4.1 Reasons for holding inventories

There are three general motives for holding inventories:

- A. **Transactions motive:** It emphasizes the need to maintain inventories to facilitate smooth production and sales operations of a company. A company should maintain adequate stock of materials for a continuous supply to the factory for an uninterrupted production. Therefore it is necessary to maintain appropriate level of inventory.
- B. **Precautionary motive:** It is necessary for holding of inventories to ensure its availability in case of shortage or adverse price movement. This is because of the production process cannot be stopped for such a product.

- C. **Speculative motive:** It influences the decision to increase or reduce inventory levels to take advantage of price fluctuations.

No activity is undertaken without some objective. Let's now discuss the objectives of inventory management.

8.4.2 Objectives of Inventory Management

The following are the objectives of inventory management.

- Ensure a continuous supply of raw materials to facilitate uninterrupted production
- Maintain sufficient stock of raw materials in periods of short supply and anticipate price changes
- Maintain sufficient level of finished goods inventory for smooth sales operations and efficient customer service
- Minimise the inventory costs
- Control inventory investment by maintaining optimum inventory

8.4.3 Inventory management techniques and control

All the companies have the opportunity to reduce the inventory level and related cost significantly through the use of various inventory control techniques. These can be grouped into two categories:

- A. **Traditional Techniques:** it includes inventory control ratios, two bin system, perpetual inventory system, and periodic inventory systems.
- B. **Modern Techniques:** It includes Economic Ordering Quantity (EOQ) and Re-order Point.

Let us discuss about the modern techniques:

Economic order quantity (EOQ): It refers to the level of inventory that minimises the total cost of inventory such as holding cost, storage cost and ordering cost. This is used as a part of continuous review inventory system, because the level of inventory is monitored at all times and a fixed quantity is ordered each time the inventory level reaches a specific reorder point. This technique can be a valuable tool for small business owners who need to make decisions about how much inventory to keep on hand, how many items to order each time, and how often to reorder to incur the lowest possible costs.

Let's see what ordering and carrying costs are? :

Ordering costs: The term ordering costs includes the entire costs of acquiring raw materials by a company. It includes costs incurred in the following activities: requisitioning, purchase ordering, transporting, receiving, inspecting and storing (store placement). It increases in proportion to the number of orders

placed. It is more appropriate to include clerical and staff costs on a pro rata basis.

Carrying Costs: Costs incurred for preserving a given level of inventory are called carrying costs. They include costs on storage, insurance, taxes, deterioration and obsolescence. The storage costs comprise cost of storage space (warehousing cost), stores handling costs and clerical and staff service costs (administrative costs) incurred in recording and providing special facilities such as fencing, lines, racks etc.

The following are the assumptions of EOQ model:

Assumptions:

- Annual demand is known with certainty
- Usage of materials is steady over time
- Orders placed to restore inventory stocks are received just in time when inventories reach zero
- Ordering cost per order and carrying cost per unit are assumed to be constant

EOQ can be calculated with help of the following formula:

$$EOQ = \sqrt{2AO \div C}$$

Where A = Annual Consumption

O = Ordering cost

C = Carrying cost

Reorder Point or level: One among the important assumption of EOQ model is that the lead-time for procuring material is zero. But in real life practice a company never encounters a zero lead-time. There is always a time lag from the date of placing an order for material and the date on which materials are received. As a result the reorder level is always at a level higher than zero, and if the firm places the order when the inventory reaches the reorder point, the new goods will arrive before the firm runs out of goods to sell. The decision on how much stock to hold is generally referred to as the order point problem, that is, how low should the inventory be depleted before it is reordered. The two factors that determine the appropriate order point are the lead time (i.e., the difference between the order date and the receipt of the inventory ordered) and the normal consumptions during the lead time. Therefore reorder point with certainty:

$$\text{Reorder point} = \text{Lead time} \times \text{average daily usage}$$

For example, the average daily usage rate of a material is 50 units and the lead-time is seven days, then Reorder level is (50 units x 7 days) = 350 units. Hence, when the inventory level reaches 350 unit you should place the

order for material. By the time the inventory level reaches zero towards the end of the seventh day from placing the order materials will reach and there is no cause for concern. Assume that if the goods are not reached on seventh day Or if your consumptions vary, what will happen? Production gets disrupted. Because of this reason, you have to keep some buffer stock to meet the requirements. Then you have to calculate the reorder point as given below:

Reorder point = (Lead time x average usage) + safety stock

Let us move on to the selective inventory control techniques:

Selective Inventory Control Techniques

1. **ABC [Always Better Control] Analysis:** ABC analysis popularly known as "Always Better Control" is a very useful approach to inventory management. Usually a company has to maintain several types of inventories. It is not desirable to keep the same degree of control on all the items. The firm should pay maximum attention to those items whose value is the highest. The firm should, therefore, classify inventories to identify which items should receive the most effort in controlling. The firm should be selective in its approach to control investment in various types of inventories. This analytical approach is called the ABC analysis and tends to measure the significance of each item of inventories in terms of its value. According to this method, 10% of all inventory items and account about 70 % of the total consumption value described are as Group A. The next 20% of all inventory items and 20 % of financial resources are described as Group B. And remaining 70 % items account for just 10% of the consumption value are described as Group C.
2. **VED [Vital, Essential, Desirable] Analysis:** It can be defined as the analysis of maintenance spares into -V Items – Items of vital importance, E Items – Items of essential importance, D Items – Items of desirable importance. It is widely used in automobile industry especially for the maintenance of the spare parts. ‘V’ Items are important for continuous operations for example machine cannot run without V items. ‘E’ items are essential for continuous operations. For example without that item, machine can run some few hours. Desirable importance in the way denotes machine can run but factor of safety, industrial formalities can’t be satisfied (i. e) wearing ear protection aid.

8.5 Summary

In this chapter, we have discussed about the various components of working capital management. In cash management, we have discussed about how to find the optimal cash balance and how to maintain the optimum cash

balance so that operations can run smoothly. Similarly we have discussed about the receivables and inventory management.

8.6 Self Assessments Questions

1. What are the reasons for holding cash balance?
2. Explain the Baumol model of cash management.
3. How is temporary cash surplus managed?
4. Define 'cash planning'.
5. Discuss the effects of liberal versus stiff credit standards.
6. Discuss about credit period and cash discount.
7. What are the reasons for keeping inventory in an organization?
8. What are the objectives of inventory management?
9. Discuss about the inventory management techniques.

8.7 References and Further Readings

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