
UNIT 1: INTRODUCTION TO FINANCE

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1.0 AIMS AND OBJECTIVES

This unit aims at presenting the meaning of finance, classification of finance, evolution of finance and sources of finance.

After completing this unit, you will be able to:

- ☞ understand the term finance
- ☞ explain the importance of finance
- ☞ list out the various sources of finance
- ☞ distinguish between public finance and business finance.

1.1 INTRODUCTION

In simple language finance is money. To start any business we need capital. Capital is the amount of money required to start a business. The mobilization of finance is an important task for an entrepreneur therefore, finance is one of the significant factors which determine the nature and size of any enterprise. This is to be noted that identification of sources of

finance from time to time to finance the assets of an enterprise is critical as it avoids the financial hardships of an enterprise. The finance is required to acquire various fixed assets and current assets. This course discusses the meaning of finance types of finance need of finances, objectives, and functions of financial management in detail.

1.2 MEANING OF FINANCE

Finance is the study of money. Finance means to arrange payment for. It is basically concerned with the nature, creation, behavior, regulation and problems of money. It focuses on how the individuals, businessmen, investors, government and financial institutions deal. We need to understand what money is and does is the foundations of financial knowledge. In this content it is relevant to study the structure and behavior of financial system and the role of financial system in the development of economy and the profitability of business enterprises.

1.3 CLASSIFICATION OF FINANCE

The finance is classified into three categories

- I. Personal finance
- II. Public finance
- III. Business finance

- I. **Personal finance:** - This deals with the mobilization of funds from own sources. Here funds may imply cash and non-cash items also.
- II. **Public finance:** - This kind of finance deals with the mobilization or administration of public funds. It includes the aspects relating to the securing the funds by the government from public through various methods viz. taxes, borrowings from public and foreign markets.
- III. **Business finance:** - Financial management actually concerned with business finance. Business finance is pertaining to the mobilization of funds by various business enterprises. Business finance is a broad term

includes both commerce and industry. It applies to all the financial activities of trade and auxiliaries of trade such as banking, insurances, mercantile agencies, service organizations, and the manufacturing enterprises.

The following are the basic forms of organizations

- a) Sole trading
- b) Partnership
- c) Corporation
- d) Co-operative

In olden days the individual as a sole trader used to bring in his capital and manage with the help of family members. This system has suffered with certain constraints like limited resources, lack of expertise etc. Later, partnership form come into existences to overcome some of the defects of sole trading. The partners used to contribute in the form of money, assets expertise, management etc and profits will be shared on agreed terms.

With the growth of industrialization, many business establishments have preferred to set up corporate form of organization to overcome the major defects of sole trading and partnership form of organization. In case of corporate form of organization the finances are raised through shares, bonds, banks, financial institutions, suppliers etc. We do come across another form of organization i.e. co-operatives. The co-operatives raise funds through the members, government and financial institutions. Thus business finances can be classified into four categories

- I. Proprietary finance
- II. Partnership finance
- III. Corporate finance
- IV. Industrial finance

- I. **Proprietary finance** – This refers to the procurement of finds by the individuals, organizing themselves as sole traders.

- II. **Partnership finance** – It is concerned with the mobilization of finances by the partners of a business organizations/partnership firms
- III. **Corporation finance** – It deals with the raising of finances by corporate organizations. It includes the financial aspects of the promotion of new enterprises and their administration during early period, the accounting, administration problems arising out of growth and expansion.
- IV. **Industrial finance** – This deals with raising of finances from all sources. It is the study of principles relating to securing the finances from the financial institutions and other institutional sources like banks and insurance companies.

1.4 GROWTHS AND EVOLUTION OF FINANCE

The Economics is the mother of finance. It emerged as a separate discipline few years back. Economics is used to deal with all the aspects of finance as an integral part of it. It is only in the recent past, i.e. 1920 it has emerged as an independent subject. Many authors like Thomas Greene and Edward S. Meade written on corporation finance. A landmark in this period by author S. Dewing titled 'Financial policy of corporations. Later period it is witnessed large scale corporate failures and therefore attention was focused on the financial aspects of liquidation, mergers and amalgamations. Finance during forties and fifties was dominated by issues like capital budgeting, capital structure and cost of capital. The sixties saw the portfolio theory in finance. The period of seventies and eighties saw working capital management, problems of small-scale industries and public enterprises. The development in this discipline is continuing.

Day by day, it is gaining importance because it is useful to the business organization. To acquire all the factors of production, finance plays key role. One cannot think of setting up a business or an establishment without finance. For a business organization finance is lifeblood. In a corporate

activity mobilization of funds and their administration pose a great challenge.

The profitability is dependent on the optimal utilization of funds. A well financially managed company will have many advantage over other company in addition to earning higher rate of return moreover, the survival or closure will purely depend on the financial decisions. The corporation finance assumes further importance because of the dichotomy between the ownership and management of the organizations, a feature of the corporate form of organization.

All sections of the society will be benefited by the understanding of the principles of corporation finance. With effective principles of financial management, the consumers will get products at lower prices, workers can get higher wages and stock holders will get higher dividend.

1.5 FINANCIAL MARKETS INSTRUMENTS - INSTITUTIONS

1. Financial Markets

Financial markets is a place where the business houses can raise their long and short-term financial requirements. The development of financial markets indicate the development of economic system. For mobilization of savings and for rapid capital formation, healthy growth and development of these markets are crucial. These markets help promotion of investment activities, encourage entrepreneurship and development of a country. The financial markets are broadly divided as

- I. Capital market and
- II. Money market

I. Capital market

Capital market is defined as a place where all buyers and sellers of capital funds as well as the entire mechanism for facilitating and effecting long

term funds. It provides the long-term funds that are needed for investment purpose. Thus, the capital markets are concerned with long-term finance. This also includes the institutions, facilities and arrangements for the borrowing and lending of long-term funds.

Further the capital markets are divided into two categories one is primary market other one is secondary market.

Primary market - In the primary market only new securities are issued to the public. It is a place where borrowers exchange financial securities for long-term funds. It facilitates the formation of capital. The securities may be issued directly to the individuals, institutions, through the underwriters etc.

Secondary market - The shares subsequent to the allotment are traded in the secondary market. Any body can either buy or sell the securities in the market. Secondary market consists of stock exchange. In the stock exchange outstanding securities are offered for sale and purchase.

II. Money Market

Money market deals with short-term requirements of borrowers. It is concerned with the supply and demand for a commodity or service. It handles transactions in short-term government obligations, bankers acceptances and commodity papers. In money market funds can be borrowed for short period varying from a day to a year. It is a place where the lending and borrowing of short-term funds are arranged and it comprises short-term credit instruments and individuals who participate in the lending and borrowing business.

2. Financial Instruments

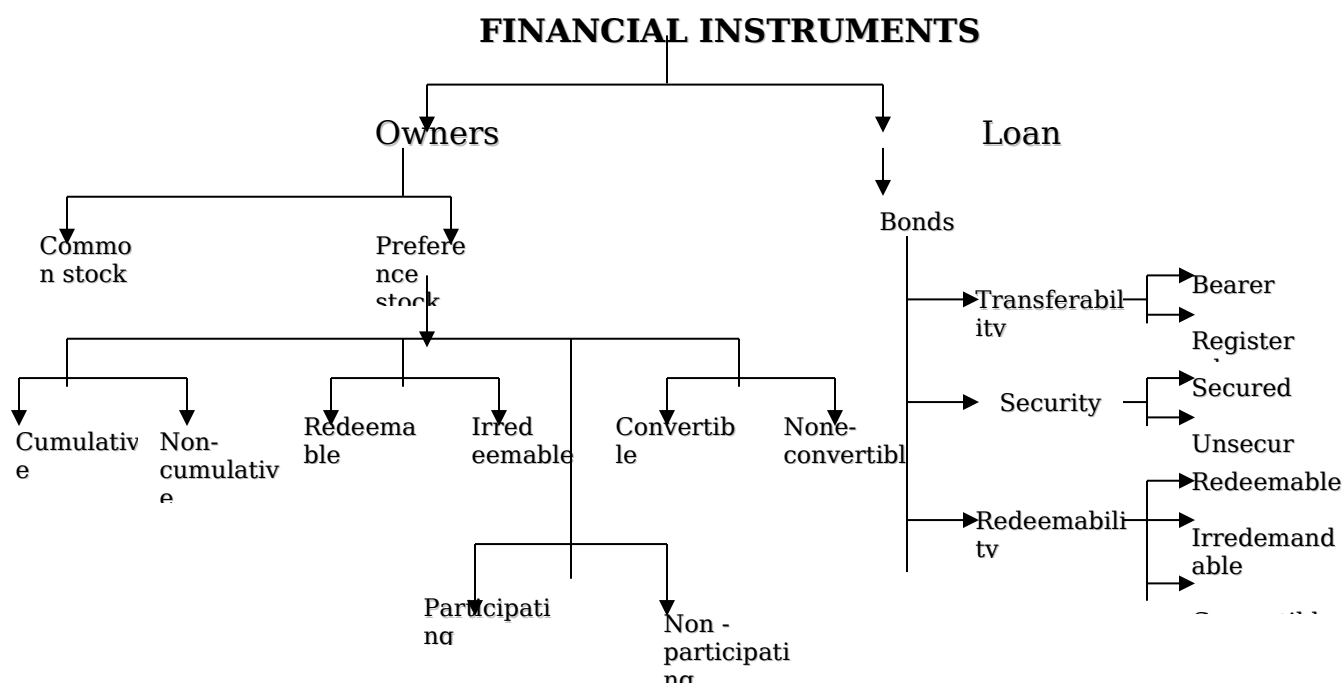
There are mainly two kinds of securities namely ownership securities and loan securities. Further ownership securities are classified into two (a)

common stock and (b) preference stock. These securities or instruments are being traded in capital markets.

Common stock - It is also known as equity shares, who are the real owners of the business will enjoy the profit or loss suffered by the company. Dividend payment is not compulsory as discussed in unit 2.

Preferential stock - By name these holders have two preferential rights I) to get fixed rate of dividend at the end of every year irrespective of profits / losses of the company II) to get back the investment first when the company goes into liquidation.

Bonds - Bondholders are the money suppliers to a business unit entitled for a fixed rate of interest at the end of each year. Their stake is confined to the interest only.



3. Financial Institutions

The financial institutions include banks, development banks, investing institutions at national and international level that provide financial services to the business organizations. These financial institutions provide long-term, short-term finances and extend under writing, promotional and merchant banking services.

1.6 SOURCES OF FINANCE

The finance required for any organization could be primarily divided into two one is long-run finance to acquire the fixed assets that are useful to the business organization over a period of time i.e. more than a year, usually we call fixed capital. The other one is short-term finance which is required to keep running the fixed assets or to make them working. This is called the working capital.

Long-term sources - The important long-term sources are common stock, preference stock bonds, loans from financial institutions and foreign capital.

Short-term sources - The short-term sources are bank loans, public deposits trade credits provisions and current liabilities.

The requirements of above nature could be financed either through external sources or internal sources if it is an existing company.

- I. **External** - These are the funds drawn from outsiders. Among them the prominent are discussed below.
 - a) *Share Capital* - This is the primary source of finance to a corporate form of organization. It is the sale of equity or common stock and preference stock to the public. Which serves as a permanent capital to an organization. These holders will get dividend in return for their investment.

Common stock - The holders of these shares are owners of the company. They are the risk takers. They get dividend when the company earns profits, otherwise they do not get any dividend. Whatever profit is left after meeting all the expenses belongs to them. In the event of closure of the company they are the last people to get their claim.

Preference stock - Preference shares carry two preferential rights one is to get a fixed dividend at the end of each year irrespective of the profits, other one is to get back the original investment first when the company goes into liquidation.

Change par bonds - Another source of finance to a company is issue of bonds/ debentures. These holders are eligible to get fixed interest at the end of each year. The holders of these bonds do not wish to take any risk public deposits. The term is also mentioned while issuing bonds.

Public deposits - This is another mode of finance where the company will advertise and accept deposits for specified period at a fixed rate of interest.

Borrowings - The companies may borrow funds from banks, financial institutions etc for their requirements at the interest chargeable by the lender institution.

Foreign capital - The concept of liberalization is attracting many foreign companies to participate in the domestic companies. It can be either in the form of direct participation in the capital or collaboration in a project in the equity of the company and also provide loans some time.

Trade credits - The common means of short-term external finance is trade credits Normally, every company gets its raw material and other supplies on credit basis. This is known as trade credit. This is an important source of financing.

- II. **Internal Sources** - This is applicable for only those companies which are in existence. By virtue of their existence, they are in a advantageous position to generate some of the finance internally.
- a) **Retained earnings** - These are the funds that are retained out of the profits for meeting future contingencies. It can be either to meet the uncertainty or future growth and expansion of business. The company would be free to utilize this source. The retained profits enable a company to withstand seasonal reactions and business fluctuations. The large accumulated savings facilitate a stable dividend policy and enhance the credit standing of the company. However, the quantum of retained earnings depend on the volume of the profits made by the company.
- b) **Provisions** - Generally companies, in order to meet the legal and other obligations, create some funds for future use. These are known as provisions. They include depreciation, taxation, dividends and various current and non-current liabilities. The amount set apart in these form would be required to be paid only on certain dates. Till then the company can use them for its own purpose. For instance, taxes payable to the government are used in the business until these are paid on due date. Therefore, though for a short-while provisions would serve as a good source of internal finance.

Check Your Progress -1

1. What are the external sources of finance?

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2. List out the internal sources of finance?

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1.6 SUMMARY

Finance is a study of money management and deals with the wages in which business men, investors, governments, individuals and financial institutions deal/ handle their money. There are various types of finance Viz. proprietor finance, partnership finance, business finance, public finance etc.

The business unit requires capital for two kinds of needs namely long term requirement and short-term requirement. The external source of finance are share capital, bonds, borrowings, public deposits, trade credits and foreign capital. The internal sources of finance are retained earnings, provisions depreciation etc.

1.7 ANSWERS TO CHECK YOUR PROGRESS

1. a) Common stock
c) Preferred stock
d) Bonds/debentures
e) Public deposits
f) Trade credits
g) Banks/financial institutions borrowings
h) Foreign capital
i) Foreign Loans
2. a) Retained earnings
b) Provisions
c) Sale of unused assets

1.8 MODEL EXAMINATION QUESTIONS

I. True or False

- _____ 1. Finance has no significance in the business organizations and in the society.
- _____ 2. Finance is the study of money management.
- _____ 3. Financial management is concerned with personal finance.
- _____ 4. The finance raised through the trade credits is an internal source of finance.

II. Short answer Questions

1. What is a proprietary finance?
2. How is an understanding of corporations finance relevant to the society?
3. List out the features of preference stock.

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UNIT 2: THE ROLE AND IMPORTANCE OF FINANCIAL MANAGEMENT

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2.0 AIMS AND OBJECTIVES

The purpose of this unit is to introduce you the need of study of financial management, its scope, objectives, functions and relationship with other disciplines.

After going through this unit, you will be able to:

- ☞ understand the need of financial management
- ☞ list the objectives of financial management
- ☞ explain the functions
- ☞ narrate the relationship with other disciplines.

2.1 INTRODUCTION

In the previous unit you have learned the meaning of finance and its relevance in the growth, expansion and diversification of activities. This unit will focus attention on certain vital aspects of financial management.

2.2 NEED OF FINANCIAL MANAGEMENT

You are aware that no business can be started without finance. Finance is a scarce resource which is not available freely and it has cost. All the resources that are useful to any business organization like men, material, machines and money or finance are in nature. Since, they are limited, we cannot waste them. These resources are to be used optimally for productive purposes. Finance is one of the resources vital for any business organization. It is scarce, has cost and also alternative uses.

Finance is regarded as the lifeblood of a business enterprise. It is the guide for regularizing investment decisions and expenditure, and endeavors to squeeze the most out of every available birr. It is the sinew of a business activity. No business activity can ever be pursued without financial support. Production and distribution of goods and services in fact, will be a mere dream without flow of funds. Financial viability is perhaps the central theme of any business proposition. That's why, it has been rightly said that business needs money to make more money. However, it is also true that money begets more money only when it is properly managed. Hence, efficient management of every business enterprise is closely linked with efficient management of its finances.

Financial management involves the management of finance function. It is concerned with the planning, organizing, directing and controlling the financial activities of an enterprise. It deals mainly with raising funds in the most economic and suitable manner; using these funds as profitably as possible; planning future operations; and controlling current performance and future developments through financial accounting, cost accounting, budgeting, statistics and other means. It is continuously concerned with achieving an adequate rate of return on investment, as this is necessary for survival and the attracting of new capital. Thus, financial management

means the entire gamut of managerial efforts devoted to the management of finance – both its sources and uses – of the enterprise.

The importance of financial management cannot be over emphasized. In every organization, where funds are involved, sound financial management is necessary. It helps in monitoring the effective deployment of funds in fixed assets and in working capital. As Collins Brooks has remarked “Bad production management and bad sales management have slain in hundreds, but fault financial management has slain in thousands.”

Hence, it can be said that sound financial management is indispensable for any organization, whether it is profit oriented or non-profit oriented. It helps in profit planning, capital spending, measuring costs, controlling inventories, accounts receivable etc., In addition to the routine problems, financial management also deals with more complex problems like mergers, acquisitions and reorganizations.

2.3 SCOPE OF FINANCIAL MANAGEMENT

Financial management has undergone significant changes over the years as regards its scope and coverage. As such the role of finance manager has also undergone fundamental changes over the years. In order to have a better exposition to these changes, it will be appropriate to study both the traditional concept and the modern concept of the finance function.

Traditional Concept:

In the beginning of the present century, which was the starting point for the scholarly writings on Corporation Finance, the function of finance was considered to be the task of providing funds needed by the enterprise on terms that are most favorable to the operations of the enterprise. The traditional scholars are of the view that the quantum and pattern of finance requirements and allocation of funds as among different assets, is the

concern of non-financial executives. According to them, the finance manager has to undertake the following three functions:

- j) arrangement of funds from financial institutions;
- ii) arrangement of funds through financial instruments, Viz., shares, bonds, etc
- iii) looking after the legal and accounting relationship between a corporation and its sources of funds.

The traditional concept found its first manifestation, though not systematically, in 1897 in the book 'Corporation Finance' written by Thomas Greene. It was further impetus by Edward Meade in 1910 in his book, 'Corporation Finance'. Later, in 1919, Arthur Dewing brought a classical book on finance entitled "The Financial Policy of Corporation."

The traditional concept evolved during 1920s continued to dominate academic thinking during the forties and through the early fifties. However, in the later fifties the traditional concept was criticized by many scholars including James C. Van Horne, Pearson Hunt, Charles W. Gerstenberg and Edmonds Earle Lincoln due to the following reasons:

1. The emphasis in the traditional concept is on raising of funds, This concept takes into account only the investor's point of view and not the finance manager's view point.
2. The traditional approach is circumscribed to the episodic financing function as it places overemphasis on topics like types of securities, promotion, incorporation, liquidation, merger, etc.
3. The traditional approach places great emphasis on the long-term problems and ignores the importance of the working capital management.
4. The concept confined financial management to issues involving procurement of funds. It did not emphasis on allocation of funds.
5. It blind eye towards the problems of financing non-corporate enterprises has yet been another criticism.

In the absence of the coverage of these crucial aspects, the traditional concept implied a very narrow scope for financial management. The modern concept provides a solution to these shortcomings.

Modern Concept:

The traditional concept outlived its utility due to changed business situations since mid-1950's. Technological improvements, widened marketing operations, development of a strong corporate structure, keen and healthy business competition - all made it imperative for the management to make optimum use of available financial resources for continued survival of the firm.

The financial experts today are of the view that finance is an integral part of the overall management rather than mere mobilization of the funds. The finance manager, under this concept, has to see that the company maintains sufficient funds to carry out the plans. At the same time, he has also to ensure a wise application of funds in the productive purposes. Thus, the present day finance manager is required to consider all the financial activities of planning, organizing, raising, allocating and controlling of funds. In addition, the development of a number of decision making and control techniques, and the advent of computers, facilitated to implement a system of optimum allocation of the firm's resources.

These environmental changes enlarged the scope of finance function. The concept of managing a firm as a system emerged and external factors now no longer could be evaluated in isolation. Decision to arrange funds was to be seen in consonance with their efficient and effective use. This systems approach to the study of finance is being termed as 'Financial Management'. The term 'Corporation Finance' which was used in the traditional concept was replaced by the present term 'Financial Management.'

The modern approach view the term financial management in a broad sense and provides a conceptual and analytical framework for financial decision-making. According to it, the finance function covers both acquisition of funds as well as their allocation.

2.4 OBJECTIVES OF FINANCIAL MANAGEMENT

Financial management, as an academic discipline, is concerned with decision-making in regard to the size and composition of assets and structure of financing. To make wise decisions, a clear understanding of the objectives which are sought to be achieved is necessary. The objectives provides a framework for optimum financial decision making. Let us now review the well known and widely discussed approaches available in financial literature viz., (a) Profit Maximization and (b) Wealth Maximization.

Profit Maximization:

According to this approach, actions that increase profits should only be undertaken. Here, the term “Profit” can be used in two senses: (1) As owner – oriented concept it refers to the amount and share of national income which is paid to the owners of business, i.e., those who supply equity capital; (2) A variants for the term is profitability. It is an operational concept and signifies economic efficiency. In other words, profitability refers to a situation where output exceeds input, i.e., the value created by the use of resources is more than the total of the input resources. Used in this sense, profitability maximization would imply that a firm should be guided in financial decision-making by one test – select assets, projects and decisions which are profitable and reject those which are not. In the current financial literature, there is a general agreement that profit maximization is used in this sense.

The profit maximization theory is based on the following important assumptions:

- (a) This theory is based purely on the rationality of the individuals and the firms.
- (b) It promotes the use of resources to the best of their advantage of gain maximum out of them.
- (c) It leads to the economic selection of the resources.'
- (d) It enhances the National Income of the country through efficient and increased production.

However, the profit maximization objective has been criticized in recent past it is argued that profit maximization is a consequence of perfect competition and in the context of today's imperfect competition, it cannot be taken as a legitimate objective of the firm. It is also argued that profit maximization, as a business objective, developed in the early 19th Century when the characteristic features of the business structure were self-financing, private property and single entrepreneurship. The only aim of the enterprises at that time was to enhance the individual wealth and personal power, which could easily be satisfied by the profit maximization objective. The formation of joint stock companies resulted in the divorce between management and ownership. The business firm today is financed by owners - the holders of its equity capital and outsiders (creditors) and controlled and directed by professional managers. The other interested parties connected with the business firm are customers, employees, government and society. In this changed business structure, the owner-management of the 19th century has been replaced by professional manager who has to reconcile the conflicting objectives of all the parties connected with the business firm. In this new business environment, profit maximization is regarded as unrealistic, difficult, inappropriate and immoral.

Apart from the aforesaid objections, the other important technical flaws of this criterion are:

- a. There is a lack of unanimity regarding the concept of profit. There are various terms such as gross profit, net profit, earnings, short-term profit and long-term profit.
- b. Profits while enhancing the national income, may not contribute to the welfare of the poor, because they may lead to concentration of income and wealth.
- c. The assumptions on which it is based are untenable. There exists no perfect competition in the market. Similarly, all countries do not favor the idea of free enterprises economy. There exists certain controls, which will limit the profit maximizing capacity of the undertakings.
- d. This theory is also criticized for ignoring the timing of returns and risk. It doesn't take the returns in terms of their present value.

Ex. 1		Project A	Project B
		<u>Benefits in Birrs</u>	<u>Benefits in Birrs</u>
Period	1	5, 000	—
	2	10, 000	10, 000
	3	<u>5, 000</u>	<u>10, 000</u>
		20, 000	20, 000

Though A, B generating same profit A is preferred quality of benefits

Ex. 2 Uncertainty about expected profits

Profits in Birrs		
State of Economy	A	B
Recession	1, 000	0
Normal	1, 000	1, 000
Boom	<u>1, 000</u>	<u>2, 000</u>
	3, 000	3, 000

Again we prefer A than B

- e. More so, the term profit is viewed contempt. Every section of the society feels that they are fleeced by the enterprise. For example, consumers may feel that they are charged high prices.

Hence, the profit maximization has lost its relevance in the present day circumstances. Many financial experts like Van Horne, Weston and Brigham, Pondey, Gitman, Kuchhal, Khan, and Prasanna Chandra are now advocating for the maximization of wealth as the objective of the firm.

Wealth Maximization:

This approach is also known as Value Maximization or Net Present Wealth Maximization. Wealth maximization means maximizing the net present value (NPV) of a course of action. The NPV of a course of action is the difference between the gross present value (GPV) of the benefits of that action and the amount of investment required to achieve those benefits. The GPV of a course of action is found out by discounting or capitalizing its benefits at a rate which reflects their timing and uncertainty. A financial action which has a positive NPV creates wealth and therefore, is desirable. A financial action resulting in negative NPV should be rejected. Between a number of desirable mutually exclusive projects, the one with the highest NPV should be adopted. The wealth or NPV of the firm will be maximized if this criterion is followed in making financial decisions.

According to Ezra Solomon, the Wealth Maximization Approach provides an unambiguous measure of what financial management should seek to maximize in making investment and financing decisions. Using Solomon's symbols and methods, the NPV can be calculated as shown below:

i) $W = V - C$

Where W = Net Present Wealth

V = Gross Present Wealth

C = Investment required to acquire the asset.

ii) $V = \frac{E}{K}$

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

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

$$= G - (M+I+T)$$

Where G = Average future flow of Gross Annual Earnings expected from the course of action, before providing for maintenance charges, taxes and interest and other prior charges like preference dividend.

M = Average annual re-investment required to maintain G at the protected level.

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

T = Expected annual outflow on account of taxes.

The operational objective of financial management is the maximization of 'W'. Alternatively 'W' can be expressed symbolically by a short-cut method:

$$W = \frac{A_1}{(1+k)^1} + \frac{A_2}{(1+k)^2} + \dots + \frac{A_n}{(1+k)^n} - C$$

Where W = Net Present Wealth

A₁, A₂, A_n = Stream of cash flows expected to occur from a course of action over a period of time.

K = Appropriate discount rate to measure risk and timing.

C = Initial outlay to acquire that asset or pursue the course of action.

From the above, it is clear that the wealth maximization criterion is based on the concept of cash flows generated by the decision rather than accounting profit which is the basis of the measurement of benefits in the case of profit maximization criterion. In addition to this, wealth maximization criterion consider both the quantity and quality dimensions of benefits.

The wealth maximization objective is consistent with the objective of maximizing the owners' economic welfare. Maximizing the economic welfare of owners is equivalent of the company's shares. Therefore, the wealth maximization principle implies that the fundamental objective of a firm should be to maximize the market value of its shares.

The objective of shareholders' wealth maximization has a number of distinct advantages. It is conceptually possible to determine whether a particular financial decision is consistent with this objective or not. If a decision made by a firm has the effect of increasing the long-term market price of the firm's stock then it is a good decision. If it appears that certain action will not achieve this result then the action should not be taken. The wealth maximization objective acceptable as an operationally feasible criterion to guide financial decisions only when it is consistent with the interests of all those groups such as shareholders, creditors, employees, management and the society.

From the above discussion, it can be said that wealth maximization is the most appropriate and operationally feasible decision criterion for financial management decisions. But, wealth maximization cannot be achieved by overnight. It takes years of sustained hard work, combined with patience and perseverance. In the opinion of N.J. Yasaswy even as companies vigorously pursue to maximize their wealth in the long-run, in the short-run they have to focus on four important objectives, viz., Survival, Cash Flow, Break Even Point and Minimum Profits.

Check Your Progress -1

1. List the objectives of financial management.

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2. Why profit maximization is criticized?

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2.5 RELATIONSHIP WITH OTHER DISCIPLINES

You have learned in the previous unit that financial management is an integral part of over all management. It is not an independent area. It draws heavily on related fields of study namely economics, accounting, marketing, production and quantitative methods. We shall see the relationship with other disciplines.

Finance and Economics: You are aware that the economics has two branches one is macroeconomics and the other is microeconomics. Financial management has close relationship with each of these.

Macro-economics: The macro-economics is the study of the economy as a whole. It causes the institutional structure of the banking system money and capital markets, financial intermediaries monetary, credit and fiscal policies and economic policies dealing with and controlling level of activity within an economy. The financial manager is expected to know how monetary policy affects cost and availability of funds, undertake fiscal policy it's affect on economy, aware the financial institutions and their modes of operations to tap financial sources so on and so forth.

Micro-economics: It deals with the individual firms and will permit the firms to achieve success. The theories of micro-economics like demand supply relation and pricing strategies, measurement of utility, preference, risk and determination of value are highly useful to a finance manager to take decisions to maximize profits.

Finance and Accounting: There is close relationship between accounting and finance. Accounting is sub function of finance. The data / information

supplied by the accounting like income statement, balance sheet will serve as basis for decision making in financial management. But there are certain key differences between the two.

- I. **Treatment of funds:** The income statement prepared in accounting is based on the accrual principle. Accounting records the expenditure as and when it incurs ignoring the payments made, similarly, the revenue is recognized at the time of sale irrespective of the cash receipt. Whereas financial management is based on cash flows which are necessary to satisfy the obligations and acquire assets.
- II. **Decision-making:** Accounting collects data, prepares financial statements and presents to the top management. Financial managements will make decisions on the basis of data supplied by accounting. It relates to financial planning, controlling and decision making.

Finance and marketing, production, quantitative methods. The finance manager has to consider the impact of product development and promotion plans made in marketing will have impact on the projected cash flows. The new production process may entail additional capital expenditure. The tools that are developed by the quantitative methods are helpful in analyzing complex financial problems.

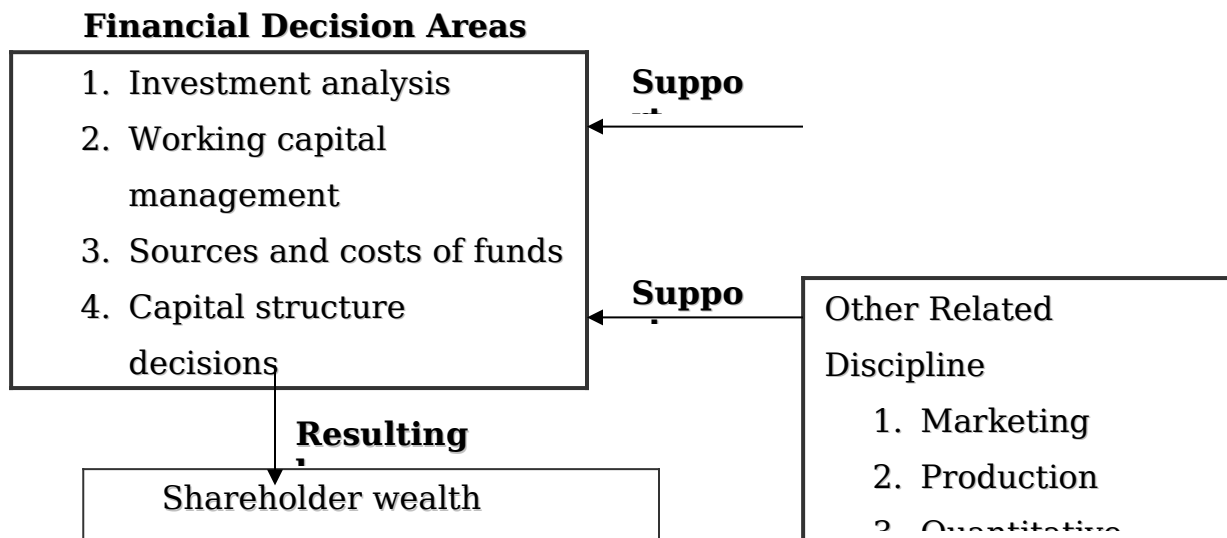
Primary Disciplines

1. Accounting

2. Macro

economics

3. Micro



Source: Financial Management Mykhan & PkJam

2.6 FUNCTIONS OF FINANCIAL MANAGEMENT

The finance functions are very important in the management of a business organization. Irrespective of any difference in structure, ownership and size, the financial organization of the enterprise ought to be capable of ensuring that the various finance functions planning and controlling are carried at the highest degree of efficiency. The profitability and stability of the business depends on the manner in which finance functions are performed and related with other business functions.

The finance functions may be broadly divided into two categories.

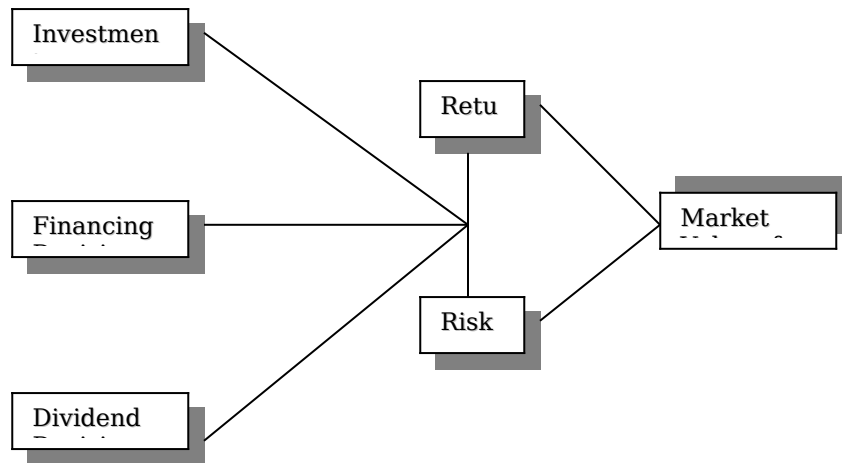
- I. Executive finance functions and
- II. Non-executive/Routine finance functions

The routine functions are repetitive in nature and the focus of financial management will be on the executive functions.

The finance function mainly deals with the following three decisions:

- 1. Investment Decision.
- 2. Financing Decision.
- 3. Dividend Decision.

Each of these functions must be considered in relation to the objective of the firm. The optimal combination of these finance functions will maximize the value of the firm to its shareholders. Fig. 1.1 given below, clearly depicts how the decisions relating to three finance functions lead to the maximization of the market value of the firm.



1. Investment Decision

The investment decision relates to the selection of assets in which funds will be invested by a firm. The assets which can be acquired fall into two broad groups: (i) long-term assets which will yield a return over a period of time in future, (ii) short-term or current assets defined as those assets which are convertible into cash usually within a year. Accordingly, the asset selection decision of a firm is of two types. The first of these involving fixed assets is popularly known as 'Capital Budgeting'. The aspect of financial decision-making with reference to current assets or short-term assets is designated as 'Working Capital Management.'

Capital Budgeting: Capital budgeting refers to the decision making process by which a firm evaluates the purchase of major fixed assets, including buildings, machinery and equipment. It deals exclusively with major investment proposals which are essentially long-term projects. It is

concerned with the allocation of firm's scarce financial resources among the available market opportunities. It is a many-sided activity which includes a search for new and more profitable investment profitable investment proposals and the making of an economic analysis to determine the profit potential of each investment proposal.

Capital Budgeting involves a long-term planning for making a financing proposed capital outlays. Most expenditures for long-lived assets affect a firm's operations over a period of years. They are large and permanent commitments, which influence firm's long-run flexibility and earning power. It is a process by which available cash and credit resources are allocated among competitive long-term investment opportunities so as to promote the highest profitability of company over a period of time. It refers to the total process of generating, evaluating, selecting and following up on capital expenditure alternatives. Capital budgeting decision, thus, may be defined as the firm's decision to invest its current funds most efficiently in long term activities in anticipation of an expected flow of future benefits over a series of years.

Because of the uncertain future, capital budgeting decision involves risk. The investment proposals should, therefore, be evaluated in terms of both expected return and the risk associated with the return. Besides a decision to commit funds in new investment proposals, capital budgeting also involves the question of recommitting funds when an old asset becomes non-profitable. The other major aspect of capital budgeting theory relates to the selection of a standard or hurdle rate against which the expected return of new investment can be assessed.

Working Capital Management: Working Capital Management is concerned with the management of the current assets. The finance manager should manage the current assets efficiently for safe-guarding the firm against the dangers of liquidity and insolvency. Involvement of funds in current assets

reduces the profitability of the firm. But the finance manager should also equally look after the current financial needs of the firm to maintain optimum production. Thus, a conflict exists between profitability and liquidity while managing the current assets. As such the finance manager must try to achieve a proper trade-off between profitability and liquidity.

Another aspect to which the finance manager of a company has to pay attention is maintenance of a sound working capital position. He often times confronted with excess and shortages of working capital. While an excessive working capital leads to unremunerative use of scarce funds; inadequate working capital interrupts the smooth flow of business activity and impairs profitability. History is replete with instances where paucity of working capital has posed to be the major contributing factor for business failures. Nothing can be more frustrating for the operating managers of an enterprise than being compelled to function in a continuing atmosphere of lack of availability of funds to meet their important and urgent operating needs.

Not only the inadequacy of working capital poses a threat to the finance manager, but also its abundance. Availability of more than required amount of funds causes an unchecked accumulation of inventories. Further, there may be a tendency to grant more and more credit without properly looking into the credentials of the customers. Moreover, idle cash earns nothing and it is unwise to keep large quantities of cash with the firm. Thus, the need to have adequate working capital in a firm need not be overemphasized.

2. Financing Decision:

In this function, the finance manager has to estimate carefully the total funds required by the enterprise, after taking into account both the fixed and working capital requirements. In this context, the financial manager is required to determine the best financing mix or capital structure of the

firm. Then, he must decide when, where and how to acquire funds to meet the firm's investment needs.

The central issue before the finance manager is to determine the proportion of equity capital and debt capital. He must strive to obtain the best financing mix or optimum capital structure for his firm. The use of debt capital affects the return and risk of shareholders. The return on equity will increase, but also the risk. A proper balance will have to be struck between return and risk. When the shareholders return is maximized with minimum risk, the market value per share will be maximized and firm's capital structure would be optimum. Once the financial manager is able to determine the best combination of debt and equity, he must raise the appropriate amount through best available sources.

The following points are to be considered while determining the appropriate capital structure of a firm:

1. Factors which have bearing on the capital structure.
2. Relationship between earnings before interest and taxes (EBIT) and earnings per share (EPS).
3. Relationship between return on investment (ROI) and return on equity (ROE).
4. Debt capacity of the firm.
5. Capital structure policies in practice.

3. Dividend Decision:

It is a fact that in spite of the various other factors which influence the market value of shares, dividend payment has been considered to be the foremost. In this context, the finance manager must decide whether the firm should distribute all profits or retain them, or distribute a portion and retain the balance. Sometimes, the profits of the company are fully diverted towards its capital expenditure or establishment of new projects so as to

minimize further borrowings. While there may be some justification in diverting profits to some extent, the claims of shareholders for dividends cannot be completely overlooked.

The finance manager has to develop such a dividend policy which divides the net earnings into dividends and retained earnings in an optimum way to achieve the objective of maximizing the market value of firm. He should also concentrate his attention on issues like the stability of dividend, bonus issue etc.

2.7 CONFLICT OF GOALS

In a corporate form of organization share holders will appoint the directors and managing director to carry on the business on their behalf. They represent the management. In a complex organization various parties are interested in the affairs of a business. The parties interested in the business are owners, creditors, customers, government etc. The management may not necessarily act in the interest of owners and may pursue its personal goals. In addition, they have to strike a balance between the interest of owners and other parties interest, who has stake in the business organization.

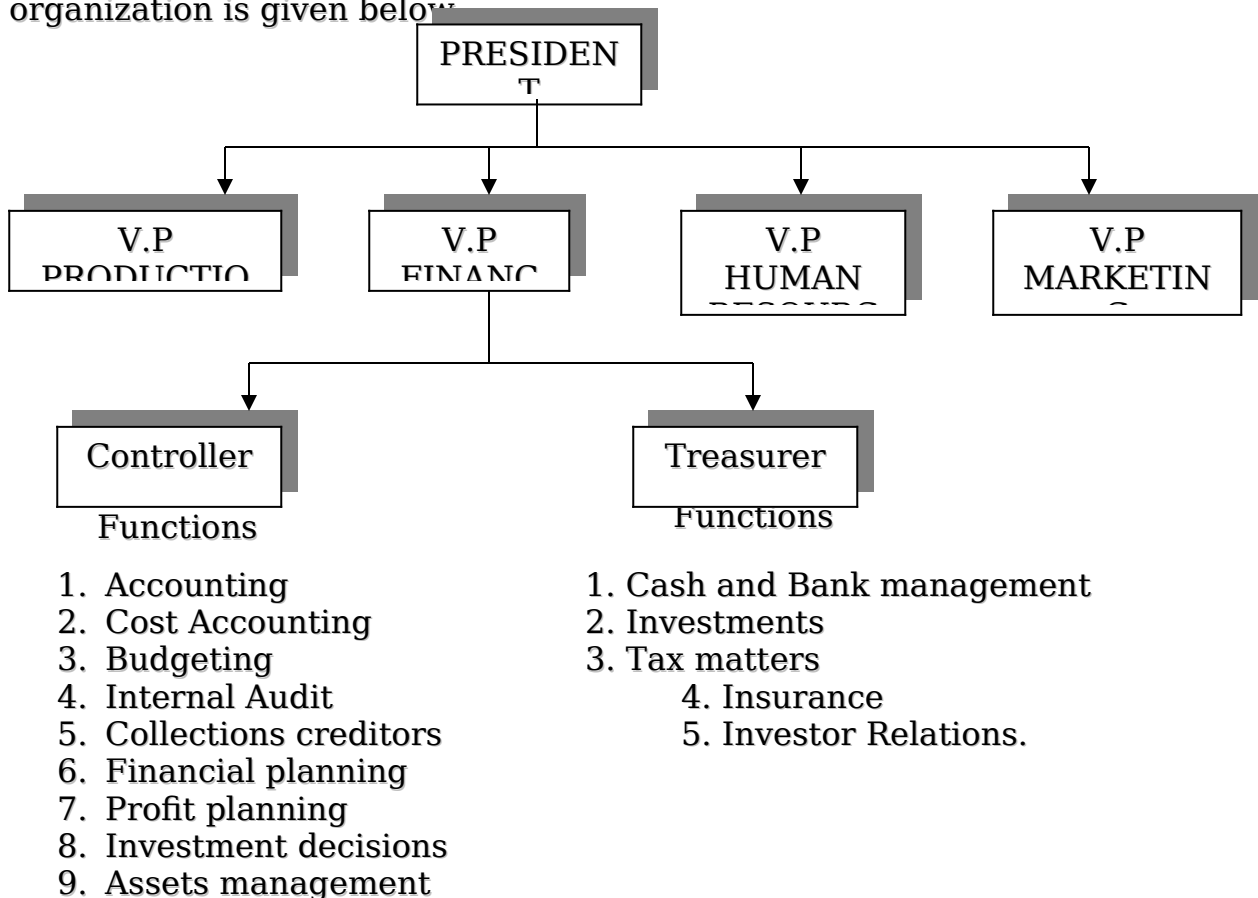
There can, however, arise situations where a conflict may occur between the shareholders and the management goals. For example, management may play safe and create satisfactory wealth for shareholders than the maximum.

2.8 ORGANIZATION OF FINANCE DEPARTMENT

A well-organized finance department is absolutely essential for the efficient financial management of an enterprise. If finance department does not operate well, the whole organizational activity will be ruined. Hence, it is essential that the finance department should be well organized with nucleus staff from the time of project stage, so that expert guidance and advise regarding the various proposals are available to the management in planning and managing the project.

The finance function, although, is controlled by the top management, there will be a separate team to look after these activities and this function will be sub-divided according to the needs. A common structure of the finance department cannot be evolved as the size of the firm and nature of the business vary, from firm to firm.

A self-explanatory organization structure of finance department in a large organization is given below



Appraisal

Role of Finance Manager:

The finance manager, who is mainly responsible for managing the finances of a firm, plays a dynamic role in the development of a modern organization. For the effective conduct of finance function he is responsible for assisting the managers and supervisors in carrying out these activities and for ensuring that their line instructions conform to the relevant specialist policy. The Finance Manager besides supervising the routine functioning of his department, also keeps the Board of Directors informed on all phases of business activity, including the economic, technological, social, cultural, political and legal environment effecting business behavior.

The finance manager generally holds one of the senior-most positions in the company, directly reporting to the President. He is primarily responsible for the entire cost, finance, accounting and taxation departments in addition to the overall administration and secretarial departments. The functions and responsibilities of the finance manager of a company generally include the following:

- i) To determine the extent of financial resources needed, and the way these needs are to be met;
- ii) To formulate programs to provide most effective profit volume-cost relationship;
- iii) To analyze financial results of all operations, reporting the fact to the top management and make recommendations concerning future operations;
- iv) To carry out special studies with a view to reducing costs and improving efficiency and profitability;
- v) To examine feasibility studies and detailed project reports mainly from the point of view of overall economic viability of the project;

- vi) To be the principal coordinating officer for preparing and operating long-term, annual and capital budgets;
- vii) To lay down suitable purchase procedures to ensure adequate control over all purchases of raw material and equipments, etc.,
- viii) To advise the chief executive on pricing, policies, interdepartmental issues including charging of overheads to jobs, etc;
- ix) To advise on all service matters to staff, such as scale of pay, dearness allowance, bonus, gratuity etc;
- x) To act as principal officer in charge of accounts, including cost and stores accounts and internal audit;
- xi) To ensure that annual accounts are prepared in time according to the provisions of the company law, and to attend to external audit;
- xii) To be the custodian of the cash and the principal disbursing officer of the enterprise;
- xiii) To be responsible for attending to all tax matters;
- xiv) To ensure that market surveys are carried out by the management;
- xv) To furnish prospective costs of products, to enable the management to determine the optimum product mix; and
- xvi) To prepare various period reports to be submitted to various authorities including financial institutions government.

2.9 SUMMARY

The subject financial management has undergone many changes due to the continuous resealed in western countries. The traditional concept is concerned with the provision of funds only. The modern concept treats finance as an integral part of the overall management rather than mere mobilization of funds. The wealth maximization is considered superior than profit maximization. The finance functions include

- a) investment decisions b) financing decisions and c) dividend decisions

2.10 ANSWERS TO CHECK YOUR PROGRESS

1. The objectives of financial management are
 - a) Profit maximization
 - b) Wealth maximization
2. The profit maximization criticized due to:
 1. Profit notions like gross profit, net profit, operating profit, profit before tax or after tax book profit or accounting profit are in usage there is lot of ambiguity among those.
 2. It will not take into account the present value of earnings.
 3. It will not consider the quality of benefits etc.

2.11 MODEL EXAMINATION QUESTIONS

1. Why do you need financial management?
2. How do you define wealth maximization?
3. Narrate the importance of financial management.
4. List out the functions of controller.
5. Draw the organization chart of finance function for a typical organization

2.12 REFERENCES

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UNIT 3: FINANCIAL STATEMENT ANALYSIS

Contents

- 3.0 Aims and Objectives
- 3.1 Introduction
- 3.2 Importance of Financial Statements
- 3.3 Uses of Financial Statements
- 3.4 Financial Analysis
- 3.5 Objectives of Financial Analysis
- 3.6 Types of Financial Analysis
- 3.7 Techniques of Financial Analysis
- 3.8 Summary

3.9	Answers to check Your Progress
3.10	Model Examination Questions
3.11	References

3.0 AIMS AND OBJECTIVES

This unit aims at presenting the term financial statements, importance, objectives, uses, financial analysis meaning, importance and techniques of financial analysis.

After going through this unit, you shall be able to:

- ☞ understand the financial statements
- ☞ list the users of financial statements
- ☞ explain the terms analysis and interpretation
- ☞ identify the techniques of financial analysis.

3.1 FINANCIAL STATEMENTS

In financial accounting, you have learned the process of preparation of financial statements. Financial statements are the end products of accounting system. The two basic financial statements are required to be prepared for the purpose of external reporting are balance sheet and income statement. For internal purposes of planning, decision making and control much more information is contained in Balance sheet and Income statement.

I. Balance Sheet:

This is one of the important financial statements. It indicates the financial position of an accounting entity at a particular, specified movement of time. It is valid only for a single day, the very next day it will become obsolete. It contains the information about the resources, obligations of a business entity and the owners interest at a specified point of time.

II. Income statement:

This report has greatest importance to the users of financial statements. It is a performance report recording the changes in income expenses, profit and losses as a result of business operations during the year between two balance sheet dates. The income statement is valid for the whole year.

3.2 IMPORTANCE OF FINANCIAL STATEMENTS

Financial statements are the index of the financial affairs of a company. To the owners of the company, they reveal its progress as evidence by earnings and current financial condition; to the prospective investors they serve as mirror reflecting potential investment opportunity; to the creditors they reflect the credit worthiness; labor unions are able to know the fair sharing of bonus; the economist can judge the extent to which the current economic environment has effecting its business activity; to the government the financial statements offer a basis of taxation, control of costs, prices and profits and; to the management they reveal the efficiency with which business affairs are conducted.

3.3 USERS OF FINANCIAL STATEMENTS

The following are interested in financial statements

1. **Owners:** The owners of a business unit has primary concern in operational and financial results of the company. They wanted to know how safe their investment is and how effectively it is being used. They expect periodical reports from the directors who are the custodians of their money.
2. **Managers:** The managers are entrusted with the financial resources contributed by the owners and other suppliers of funds for effective utilization. In their pursuit to take the company to the destination of wealth maximization and maximization of economic welfare of winners, the managers take several decisions. If their decisions are to be right and timely, they require relevant financial information.

3. **Creditors:** The money suppliers are known as the creditors. They are interested in short-run periodical payment i.e., payment of interest and in long-run to get back their money. It may include the trade credits also. Thus, financial statements are highly useful.
4. **Prospective Investors:** Depending upon the financial performance, their financial soundness and professional way managing the business activities may retain the interest of existing stock holders and attract the potential. Prospective stock holder, who has the inclination to invest their surplus or savings. The only basis for them to estimate the financial position is company's financial information i.e., income statement and balance sheet.
5. **Employees and Trade Unions:** The financial statements are used by the employees working in the company. It will help them to understand the earning capacity of the firm and the amount spent on welfare, bonus fringe benefits, working conditions etc. The trade unions will have better bargaining edge, when it has full information about the financial date.
6. **Consumers:** The customers are also interested in the financial statements of a company. Since, they are the one who is going to bear the cost of goods or services provided by a company. A realistic appraisal of the firm activities through financial statements would enable them to know whether they are over priced or exploited by being charged unduly high rates/prices.
7. **Government:** It may be seen all over the world today that the governments as the custodians of general public have assumed a dynamic role in shaping the economic activities to take their own course in the hands of a few, self-interested capitalists, the governments have started planning, regulating and controlling the economic affairs of the country in a systematic way. All these efforts to be fruitful require information about the economic activities of individual organizations. The financial statements of individual

companies serve as a source of information on the basis of tax levies, granting subsidies or loans, imposing controls, fixing prices, offering protection or even nationalization, taking over managements etc. the government uses the financial statements of the business unit as a source.

3.4 FINANCIAL ANALYSIS MEANING AND IMPORTANCE

Financial statement analysis is a process of synthesis of summarization of financial statements and operative data (presented in financial statements) with a view to getting an insight into the operative activities of a business concern. It is a technique of investigating the financial positions and progress of the unit. By establishing some relationship between balance sheet and income statement, analysis attempts to reveal the meaning and importance of various items contained in the financial statements. An analysis of financial statements gives a detailed account of business operations and their impact on the financial health of the company.

For the purpose of financial analysis, we have to re-organize and re-arrange the data contained in financial statements. The data may be grouped and re-grouped on the basis of resemblances and affinities into categories of a few principal elements. These categories are clearly defined so that their computations can be readily made. Through such classification and re-classification the financial statements will be recast and presented in a condensed form. The changed arrangement of items will be different from the original financial statements.

The analysis of financial data i.e., classification of the data into groups and sub-groups and establishment of relationships among them, is followed by interpretation. The term interpretation means explaining the meaning and significance of data. So simplified. It involves drawing inferences from the analyzed data about the different aspects of the operational and financial results of the business and its financial health.

Analysis and interpretation are closely inter linked. They are complementary to each other. Analysis without interpretation is useless and interpretation without analysis is impossible. But, generally, the term analysis is used to include interpretation as well since, analysis is always aimed at interpretation of the relationships that are established in the course of analysis. Thus, it can be stated that analysis involves compilation, comparison and study of financial and operative data and preparation, study and interpretation of the same.

3.5 OBJECTIVE OF FINANCIAL ANALYSIS

The main objective of financial analysis is to reveal the fact and relationships among the managerial expectations and the efficiency of the business unit. The financial strengths and weaknesses, its credit worthiness can also be known through such an analysis. The safety of funds invested in the firm, the adequacy or otherwise of its earnings, the ability to meet its obligations etc. can also be examined through an analysis of their financial statements.

Of course, the financial analysis reveals only what has happened in the past. But, we can predict future basing on past.

The management of the business unit is concerned, analysis can be used as a means of self-evaluation. Through analysis the banker can assess the liquidity positions of the client firm and a creditor can determine the credit worthiness. Analysis of financial statements helps an investor in knowing the safety of his funds and the possible returns on the same. The bond holders can know whether the income generated by the firm would provide sufficient margin to pay interest as well as principal on maturity. Through an analysis of financial statements of firms, an economists can gauge the extent of concentration of economic power and lapses in the financial policies perused. The employees and trade unions can know how the firm stands in relation to labor and its welfare. The analysis provides a basis to

the government relating to licensing controls, price fixation, ceiling of profits, dividend freeze, tax subsidy and other concessions.

3.6 TYPES OF ANALYSIS

The financial analysis can be broadly divided into two

- I) external analysis and
- II) internal analysis.

External Analysis: This kind of analysis will be undertaken by the outsiders of the business unit. These outsiders include investors, creditors, money suppliers, government and labor unions. They do not have the access to the records of the company and depend on the published financial statements and other information which the company furnishes.

Internal Analysis: This analysis is done by persons within the organization. They will have the access of data i.e., the records of accounting and other information related to the business. They include executives or employees of the organization.

Check Your Progress -1

1. What is analysis of financial statements?

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2. Analysis which is done by the persons within the organization is called.

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3. Name the financial statements.

-
-
-
4. List the users of financial statements.
-
-
-

3.7 TECHNIQUES OF FINANCIAL ANALYSIS

In the process of financial analysis various tools are employed. The most prominent amongst them are listed as below:

1. Comparative statements
2. Common size statements
3. Trend Analysis
4. Ratio Analysis
5. Fund flow and cash flow analysis

Comparative Statements: Comparative statements are prepared to provide time perspective to the consideration of various elements of operations and financial position of the business embodied in the statement. Here, the figures for two or more periods are placed side by side to facilitate comparison. In addition to absolute figures the ratios constructed from the financial statements are also presented in the form of comparative statements. Both, balance sheet and income statement are presented in the form of comparative statements.

Common Size Statements: Under this technique the individual items of income statement and balance sheet are expressed as percentages in relation to some common base. In income statement, sales are usually taken as hundred and all items are expressed as percentage of sales. Similarly, in balance sheet the total of assets or liabilities treated

equivalent to hundred and all individual assets or liabilities are expressed as percentage of this total.

Trend Analysis: It is highly helpful in making a comparative study of the financial statements for several years. The calculation of trend percentages involves the calculation of percentage relationship that each item bears to the same item in the base year. Any year may be taken as base year. Usually, the first year will be taken as the base year. Any intervening year may also be taken as the base year. Each item of the base year is taken as 100 and on that basis the percentage for each of the item of each of the years are calculated. These percentages can also be taken as the index numbers showing the relative changes in the financial data over a period of time.

Ratio Analysis: Ratio analysis is a tool which establishes a numerical relationship of between two figures normally expressed in terms of percentage. This has been discussed in detail in the next unit.

Fund flow and Cash flow Analysis: The changes that have taken place in the financial position of a firm between two dates of balance sheets can be ascertained by preparing the fund flow statement which contains the sources and uses of financial resources. This is a valuable aid to finance manager, creditors and owners in evaluating the uses of funds by a firm and in determining how these uses are financed. This statement also helps to assess the growth of the firm and its resulting financial needs to decide the best way to finance those needs.

Cash flow statement summaries the causes of changes in cash position between two dates of two balance sheets. It indicates the sources and uses of cash. This statement is similar to statement prepared on working capital basis, except that it focuses attention on cash instead of working capital.

3.8 SUMMARY

The term 'Financial Statements' include balance sheet and income statement. The former one reflects on the financial soundness of a business unit as on a particular date, the later one provides the profit/loss made during a particular year. There are various people interested in financial statements like owners, manages, creditors, consumers, government, employees etc.

Financial analysis is a process evaluating the soundness of a business unit from the print of view of all parties interested in the affairs of the business. Different people may use different tools to suit their individual purposed.

3.9 ANSWERS TO CHECK YOUR PROGRESS

1. I. Analysis is a process of summarization of financial statements with a view to getting an insight into the operative activities of a business unit.
- II. Internal analysis
- III. Balance sheet and income statement are the financial statements.
- IV. Owners, managers, creditors, government, employees, trade unions etc.

3.10 MODEL EXAMINATION QUESTIONS

1. State the objectives of financial statements.
2. Distinguish between balance sheet and income statement.
3. Who are the users of financial statements?
4. What is meant by financial analysis?
5. Differentiate between analysis and interpretation.
6. List out the techniques of financial analysis.

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UNIT 4: RATIO ANALYSIS

Contents

- 4.0 Aims and Objectives
- 4.1 Introduction
- 4.2 Meaning of Ratio and Ratio Analysis
- 4.3 Importance of Ratio Analysis
- 4.4 Limitations of Ratio Analysis
- 4.5 Classification of Ratios
- 4.6 Leverage Ratios or Capital structure Ratios
- 4.7 Coverage Ratios
- 4.8 Liquidity Ratios
- 4.9 Activity Ratios
- 4.10 Profitability Ratios
- 4.11 Summing Up
- 4.12 Answers to Check Your Progress
- 4.13 Model Examination Questions
- 4.14 Recommended Books

4.0 AIMS AND OBJECTIVES

This unit aims at discussing the meaning, importance and limitations of ratio analysis. It also explains the different ratios and their uses.

After reading this unit, you will be able to:

- ☞ grasp the significance of ratio analysis

- ☞ understand the limitations of ratios
- ☞ classify the ratios
- ☞ calculate the ratios and interpret the different kinds of the specific purposes.

4.1 INTRODUCTION

The preceding unit is about the meaning and importance of financial statement analysis, and also the various tools or techniques of financial analysis including the simple and commonly used tools of analysis, viz., comparative statements and common size statements. But these simple tools will not be helpful to the analyst to make out the firm's financial position and performance. For a meaningful and realistic assessment of the position and performance of the firm the analysis (analyst) should try to establish and evaluate the relationship between different component items of the basic financial statements, i.e., Balance Sheet and Income Statement. Ratio analysis will be found useful in this regard. Ratio analysis has become the most widely used and powerful tool of financial analysis. The importance of ratio analysis is so much that sometimes ratio analysis is regarded as a synonym to the financial analysis.

4.2 MEANING OF RATIO AND RATIO ANALYSIS

The term, 'ratio', refers to the numerical or quantitative relationship between items or variables. It shows an arithmetical relationship between two figures. It is also defined as "the indicated quotient of two mathematical expressions" and as "the relationship between two or more things". The relationship between two accounting figures expressed mathematically is known as 'financial ratio' or 'accounting ratio' or simply

as a ratio. These ratios are generally expressed in three ways. It may be a quotient obtained by dividing one value by another. For example, if the current assets of a business on a particular date are Birr 200, 000 and its current liabilities Birr 100, 000 the resulting ratio would be Birr 200, 000 divided by 100, 000 i.e., 2:1. The ratio can be expressed as a percentage as well. Taking the same particulars, it may be stated that the current assets are 200% of the current liabilities. Sometimes ratios are expressed as so many 'times' or 'fraction': for example, the current assets may be stated as being double the current liabilities or current liabilities was half of current assets.

Ratio analysis is the process of computing, determining and interpreting the relationship between the component items of financial statements.

4.3 IMPORTANCE OF RATIO ANALYSIS

Ratio analysis is an extremely useful and the most widely used tool of financial analysis. It makes for easy understanding of financial statements. It facilitates intra-and inter-firm comparison. Ratios act as an index of the efficiency of the enterprise. A study of the trend of strategic ratios helps the management in planning and forecasting. Ratios help the management in carrying out its functions of coordination, control and communication. The analysis of ratios may reveal maladjustments in planning, organizing, coordinating and monitoring different activities of an organization. It will help to identify the specific weak areas, causes thereof and type of remedial actions called for. A purposeful ratio analysis helps in identifying problems such as the following and in finding out suitable course of action.

- (a) Whether the financial condition of the firm is basically sound,
- (b) Whether the capital structure of the firm is appropriate,
- (c) Whether the profitability of the enterprise is satisfactory,

- (d) Whether the credit policy of the firm is sound, and
- (e) Whether the firm is credit worthy.

In short, through the technique of ratio analysis the firm's solvency both long and short term efficiency and profitability can be assessed.

4.4 LIMITATIONS OF RATIO ANALYSIS

At the outset it should be noted that ratio analysis is not an end in itself but a means to the answering of specific questions which the users of the financial statements have in relation to the financial condition and results of operations of the firm.

Ratios are derived from financial statements. The financial statements suffer from a number of limitations and ratios which are derived from these statements are also subject to these limitations.

Ratios are meaningless, if detached from their source.

Ratios, as they are, are not of much significance. They become useful only when they are compared with some standards.

Ratio analysis should be made with caution in the case of inter-firm comparison. Unless the firms in question follow identical accounting methods for items like depreciation, stock valuation, deferred revenue expenditure, the writing off of capital items, etc., ratios will not reflect the figures which are truly comparable.

No ratio may be regarded as good or bad as such. It may be an indication the firm is weak or strong, not a conclusive proof there of.

Ratio analysis may give misleading results if the effect of changes in price level is not taken into account.

No ratio analysis can be meaningful unless the questions sought to be answered are clearly formulated.

The nature of the business (whether trading or manufacturing) and the industry's characteristics which affect the figures in the financial statements and their inter-relationships should be clearly understood and born in mind in order to made meaningful ratio analysis.

The social, economic and political conditions which form the background for the firm's operations should be understood so as to make ratio analysis meaningful.

These limitations, to a considerable extent, can be eliminated or corrected:

- 1) if the analysis is related to one firm over a period of time;
- 2) if the analysis is limited to a few well chosen ratios which can answer specific questions;
- 3) if the results of the firm are compared with suitable norms or standards;
- 4) if the ratios are used primarily for the identification of areas for further managerial analysis and formulation of alternatives available to the management in solving such problems;
- 5) if the ratios are interpreted in the light of social, political, economic, technological and business conditions under which the firm operates.

If ratio analysis is done mechanically it will be not only misleading but also positively dangerous. If it is used with a measure of caution, reason, and logic it can be a powerful management tool not so much for providing answers but for highlighting management issues and for identifying possible alternatives.

4.5 CLASSIFICATION OF RATIOS

Some writers have contended that there are as many as 429 business ratios. But all these ratios need not be calculated for a particular study. On

the basis of the nature of the business concern, the circumstances in which it is operating, and the particular questions to be answered from the ratio analysis, certain ratios should only be selected. Every attempt should be made to keep the number of ratios as far as possible to the minimum. This avoids possible confusion in the interpretation of ratios.

Financial ratios may be classified in various ways.

- I. On the basis of their importance the ratios may be classified as (1) Primary ratios and (2) Secondary ratios. Operating Profit (before interest and taxes) to operating capital employed is usually described as the primary ratio. Under this category the various related ratios are those of operating profit to value of production, cost of production to value of production, net sales to capital employed etc.

The following ratios are usually included in the secondary ratios category:

The ratios of Direct Materials cost to value of production. Direct Material per factory employee, out put or work per factory employee, goods for sale per factory employees, etc.

- II. On the basis of the source (i.e., the financial statement(s) from which items are taken to calculate ratios) ratios may be classified into the following categories:

Balance Sheet ratios, or Income Statement ratios and combined ratios.

Balance Sheet ratios are the ratios which express the relationship between items which are both taken from the Balance Sheet. The current assets to current liabilities (called 'current ratio'). Quick assets to current liabilities (called 'Quick ratio'), Debt-Equity ratio etc. may be cited as examples.

Income statement ratios are the ratios which deal with the relationship between items of the Profit and Loss Account. Examples of this ratio are Gross Profit to sales, Net Profit to Sales, Operating ratio, etc.,.

Combined ratios are the ratios which express the relationship between two figures one of which is drawn from the Balance Sheet and the other from Income Statement.

Its examples are Activity ratios or Turnover ratios, Return on Capital employed, Return on Shareholders Equity, etc.

- III. On the basis of the nature of items the relationships of which are explained by ratios, the ratios may also be classified as Financial Ratios and Operating Ratios. Financial ratios deal with non-operational items which are financial in character. Its examples are current ratio, quick ratio, debt equity ratio, etc.

The operating ratios explain the relationship between items of operations of the firm. Its examples are turnover or activity ratios, earning ratios, expense ratios, etc.

- IV. The most important and commonly adopted classification of ratios is on the basis of the purpose or function which the ratios are expected to perform. Such ratios are also called 'functional ratios'. They include solvency ratios, liquidity ratios, activity ratios and profitability ratios. In fact, the entire ratio analysis can be discussed in relation to the orientation of the functional basis of ratio classification.

Solvency ratios reveal the long-term solvency of the firm. They show the relative interest of the owners and creditors in the enterprise.

Liquidity ratios bring out the ability of the firm to honor its financial obligations as and when they mature.

Activity ratios measure the efficiency with which funds have been employed in the business operations.

Profitability ratios measure the profit earnings capacity of the enterprise. The profitability of the firm can be viewed from the point of view of management, owners and creditors.

As mentioned earlier several ratios can be calculated from the data contained in the financial statements. All these ratios can be grouped into various classes according to the function to be evaluated. Different persons, as has been pointed out undertake financial statements analysis for different purposes. For instance, short-term creditors take interest mainly in the short-term solvency or liquidity position of the firm. Long term creditors are more interested in the long-term solvency and profitability of the firm and owners interest lies in the profitability analysis and financial condition of the firm. The management of the firm is interested in evaluating every activity of the firm. In view of the requirements of the various users of financial analysis the functional classification of ratios becomes important, some important functional ratios are explained here under:

Check Your Progress -1

i) How can you classify the Ratio?

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ii) Give two examples of Balance Sheet ratios.

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4.6 LEVERAGE RATIOS OR CAPITAL STRUCTURE RATIOS

These ratios are also known as 'long term solvency ratios' or 'capital gearing ratios.' As stated earlier, the long-term creditors (debenture holders, financial institutions, etc) are more concerned with the firm's long-term financial position than with others. They judge the financial soundness of the firm in terms of its ability to pay interest regularly as well as make repayment of the principal either in one lump sum or in installments. The long-term solvency of the firm can be examined with the help of the leverage or capital structure ratios. These ratios indicate the funds provided by owners and creditors. Generally, there should be an appropriate mix of debt and owners' equity in financing the firm's assets. Each of the two sources of funds, viz., creditors and owners depending on which of them has been used to finance a firm's assets, has a number of implications. Between debt and equity (owners' funds) debt is more risky from the firm's view point. Irrespective of the profits made or losses incurred, the firm has a legal obligation to pay interest on debt. If the firm fails to pay to debt holders in time, they can take legal action against the firm to get payment and even can force the firm into liquidation. But at the same time the use of debt is advantageous to the owners of the firm. They can retain the control of the firm without dilution and their earnings will be enlarged when the firm earns at a rate higher than the interest rate on the debt. The owners equity is created as the margin of safety by the creditors. In view of the above stated facts, it is relevant to assess the long-term solvency of the firm in terms of the owner's and creditors contribution to the firm's total capitalization.

Leverage ratios can be calculated from the Balance Sheet items to determine the proportion of debt in the total capital of the firm. Though there are many variations of these ratios all of them indicate the extent to which the firm has used debt in financing its assets.

Leverage ratios are also calculated from the income statements items to determine the extent to which operating profits are sufficient to cover the fixed charges. This type of leverage ratios are popularly known as 'coverage ratios'

The most commonly calculated leverage ratios include: (1) debt equity ratio. (2) debt to total capital ratio, and (3) gross fixed assets to shareholders funds.

1. Debt-Equity Ratio

This is one of the measures of the long-term solvency of a firm. This reveals the relationship between borrowed funds and the owners' capital of a firm. In other words, it measures the relative claims of creditors and owners against the assets of the firm. This ratio is calculated in different ways. One way is to calculate the debt equity ratio in terms of the relative proportions of long-term debt (non-current liabilities) and shareholders' equity (i.e., common shareholders equity and preference shareholders equity).

$$\text{Debt-Equity ratio} = \frac{\text{Longterm liability}}{\text{Shareholders equity}}$$

Past accumulated losses and deferred expenditure should be excluded from the shareholders equity. The shareholders equity is also known as the networth Accordingly, this ratio is also called debt to net worth ratio.'

Another approach to the calculation of the debt-equity ratio is to divide the total debt (i.e., long term liabilities plus current liabilities) by the shareholders' equity.

$$\text{Debt-equity ratio} = \frac{\text{Total debt}}{\text{Shareholders equity}}$$

There is no unanimity of opinion regarding the inclusion of current liabilities in debt for the purpose of calculating the debt-equity ratio. One opinion is to exclude current liabilities because of the following aspects:

- a) Current liabilities are of short-term nature and the liquidity ratios explain the firm's ability to meet these liabilities;
- b) The amount of current liabilities widely fluctuates during a year and the interest amount does not bear any relationship to the book value of current liabilities shown in the Balance Sheet.

The inclusion of current liabilities in the debt is favoured on the following grounds:

- 1) Whether long term or short term, liabilities represent the firm's obligations and so should be considered in knowing the risk concerning the firm.
- 2) Like long-term loans short-term loans too have a cost.
- 3) The pressure from short-term liabilities, in fact, is more on the firm than that of the long-term debt.

Interpretation of Debt-Equity ratio

For the analysis of capital structure of a firm debt-equity ratio is important. It shows the extent to which debt financing has been used in the business. It also shows the relative contributions of the creditors and the owners of the business to it. A high debt-equity ratio indicates a large share of financing by the creditors in relation to the owners or a larger claim of the creditors than those of owners. The D-E ratio indicates the margin of safety to the creditors. A very high D-E ratio is unfavorable to the firm and introduces an element of inflexibility in the firm's operations. During periods of low profits a highly debt financed company will be under great pressure; it cannot earn enough profits even to pay the interest charges.

A low debt-equity ratio implies a smaller claim of the creditors or a greater claim of the owners.

An ideal D-E ratio is 1:1. However, much will depend on the nature of the enterprise and the economic conditions in which it is operating. In periods

of prosperity and high economic activity, a large proportion of the debt may be used while the reverse should be done during periods of adversity.

2. Debt to Total Capital Ratio

This is a variation on the D-E ratio described above. This ratio reveals the relationship between the outside liabilities and the total capitalization of the firm and not merely the shareholders' equity. Like the debt-equity ratio, the debt to total capital (or capitalization) ratio takes two forms:

$$(a) \text{Debt to Total Capital Ratio} = \frac{\text{Long term debt}}{\text{Permanent capital}}$$

Permanent capital = Common Shareholders equity + Preference capital + Long term debt

$$(b) \text{Total Debt to Total Capital Ratio} = \frac{\text{Total Debt}}{\text{Permanent capital} + \text{Current liabilities}}$$

Interpretation of Debt to Total Capital Ratio

This ratio gives results similar to those of the D-E ratio in respect of the capital structure of a firm. It indicates the proportion of the outsiders' funds in the total capitalization of the firm. A low ratio represents security to creditors while a high ratio represents a risk to creditors. Though there is no norm prescribed for this ratio, conventionally a ratio of 1:2 is considered to be satisfactory.

Gross Fixed Assets to Shareholders' Funds

This ratio indicates the extent to which the shareholders' funds have been used to finance the fixed assets. Generally, the owners' capital should be enough to finance the entire fixed assets and also a part of working capital. The latest thinking or view in this area is that owners' capital plus long-term loans should finance the whole of the fixed assets and the core part of (or fixed) working capital. According to the conservatives, this ratio should generally be less than one. According to the

latest view, the ratio will be more than one. There is not distinct formula for this purpose. The decision will depend upon the type of business, nature of products and market acceptability the cost structure, capacity to generate adequate surplus, etc.

$$\text{(Gross) Fixed Assets to shareholders funds (or Net Worth) ratio} = \frac{\text{Fixed Asset}}{\text{Net Worth}}$$

Illustration -1

From the following balance sheet calculate the leverage ratios:

Balance Sheet as on 31-12-2000

	Birr		Birr
<u>Share capital</u>		Plant and Machinery	200, 000
Equity share capital	700, 000	(-) Accumulated depn.	<u>500, 000</u>
(70, 000 shares)	400, 000		1,500,
8% Preference share capital	400, 000	Goodwill	000
Reserves & Surplus	200, 000	Inventory	280, 000
Long term loan (7%)	500, 000	Receivables	300, 000
8% debentures	120, 000	Prepaid Expenses	200, 000
Creditors	40, 000	Marketable Securities	50, 000
Bills Payable	<u>170, 000</u>	Cash	150, 000
Accrued Expenses	<u>2,530,</u>		<u>50, 000</u>
	<u>000</u>		<u>2530, 000</u>

Solution

Debt-equity ratio: This ratio can be calculated by taking long-term debt or total debt into account. If the long-term debt alone is considered:

$$\text{DE Ratio} = \frac{\text{Longterm debt}}{\text{Shareholders equity}}$$

$$\frac{\text{Birr } 200000 + 500000}{\text{Birr } 700000 + 400000 + 400000} = \frac{700000}{1500000} = 0.467: \text{ or } 46.7\%$$

This indicates a low debt-equity ratio. It suggests that for every one rupee of the owners' funds the firm has raised Birr 0.467 of long term debt.

If the total debt is considered: the D-E Ratio = $\frac{\text{Total debt}}{\text{Shareholders' equity}}$

$$= \frac{\text{Birr } 200,000 + 500,000 + 120,000 + 40,000 + 170,000}{\text{Birr } 700,000 + 400,000 + 400,000} = \frac{1,030,000}{1,500,000}$$

= 0.687:1 or 68.7%

Debt to Total Capital Ratio

This ratio can be calculated by taking only the long-term debt or total debt and dividing it by permanent capital (plus current liabilities).

(a) Debt to Total Capital Ratio =

$$\frac{\text{Long Term debt}}{\text{Total capitalization or permanent capital}}$$

Permanent capital = Equity capital + Preference capital + Reserves and surplus + Long Term Debt

Debt to Total Capital Ratio =

$$\frac{\text{Birr } 200,000 + 500,000}{\text{Birr } 700,000 + 400,000 + 200,000 + 500,000}$$

$$= \frac{700,000}{2,200,000} = 0.318:1 \text{ or } 31.8\%$$

(b) Total Debt to Total Capital Ratio =

$$\frac{\text{Total Debt}}{\text{Permanent capital + Current liabilities}}$$

Total debt = Permanent Capital + Current Liabilities

$$200,000 = 2,200,000 + 330,000$$

$$500,000 = 2,530,000$$

$$120,000$$

$$40,000$$

$$\underline{170,000}$$

$$\underline{1,030,000}$$

$$= \frac{\text{Birr } 1,030,000}{\text{Birr } 2,530,000} = 0.407:1 \text{ or } 40.7\%$$

$$\begin{aligned}\text{Fixed Assets to Net worth Ratio} &= \frac{\text{Fixed Assets}}{\text{Networth or Shareholders Fund}} \\ &= \frac{2,000,000}{1,500,000} = 1.33:1\end{aligned}$$

In some cases the fixed assets are compared to the total long-term funds, i.e., Net Worth plus long-term debt in which case the ratio would be

$$\frac{\text{Fixed Assets}}{\text{Longterm funds}} = \frac{2,000,000}{2,000,000} = 1:1$$

Illustration -2

Given below is the Balance Sheet of a firm as on March 31, 2000

Capital and Liabilities	Birr	Assets	Birr
Equity share capital	200,000	Plant & machinery	302,000
10% preference share capital	80,000	Inventory	121,600
Retained earnings	54,800	Receivables	72,000
Long term debt	68,000	Cash	24,600
Sundry creditors	<u>54,400</u>		
Other current liabilities	<u>520,200</u>		<u>520,200</u>

Calculate the net worth, total debt, total capitalization and permanent capital. Also calculate the long-term solvency ratios of the firm.

Solution

Net worth = Equity Capital + Preference Capital + Retained Earnings

$$= 200,000 + 80,000 + 54,800 = \text{Birr } 334,800$$

Total Debt = long term debt + current liabilities

$$= 68,000 + 63,000 + 54,400 = \text{Birr } 185,400$$

Total capitalization = Net worth + Total Debt

$$= \text{Birr } 334,800 + \text{Birr } 185,400$$

$$= \text{Birr } 520,200$$

$$\begin{aligned}\text{Permanent capital} &= \text{Net worth} + \text{Long Term Debt} \\ &= \text{Birr } 334,800 + \text{Birr } 402,800\end{aligned}$$

Leverage Ratios

$$\begin{aligned}1. \text{ D.E Ratio} &= \frac{\text{Longtermdeb}}{\text{Networth}} \\ &= \frac{68000}{334800} = 0.203:1 \text{ or } 20.3\%\end{aligned}$$

$$\begin{aligned}2. \text{ D.E Ratio} &= \frac{\text{Totaldeb}}{\text{Networth}} \\ &= \frac{\text{Birr } 185400}{\text{Birr } 334800} = 0.554:1 \text{ or } 55.4\%\end{aligned}$$

$$3. \text{ Long Term Debt to Permanent Capital} = \frac{\text{Birr } 68000}{\text{Birr } 402800} = 0.169:1 \text{ or } 16.9\%$$

$$4. \text{ Total Debt to Total Capital Ratio} = \frac{\text{Birr } 185400}{\text{Birr } 520200} = 0.356:1 \text{ or } 35.6\%$$

$$\begin{aligned}5. \text{ Fixed Assets to Net worth Ratio} &= \frac{\text{FixedAsset}}{\text{Networth}} \\ &= \frac{\text{Birr } 302000}{\text{Birr } 334800} = 0.902:1 \text{ or } 90.2\%\end{aligned}$$

$$\begin{aligned}6. \text{ Fixed Assets to Long Term Funds Ratio} &= \frac{\text{FixedAssets}}{\text{Networth} + \text{LT Debt}} \\ &= \frac{\text{Birr } 302000}{\text{Birr } 334800 + 68000} = \frac{\text{Birr } 302000}{\text{Birr } 402800} = 0.75:1 \text{ or } 75\%\end{aligned}$$

Check Your Progress -2

1. What does Debt-equity ratio reveal?

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2. Give the formula for calculating Debt to total capital ratio.
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4.7 COVERAGE RATIOS

As stated earlier, there are two categories of leverage ratios, viz., Debt-equity ratios and Coverage ratios. The debt-equity ratios have been explained in the preceding paragraphs. The second category, i.e., coverage ratios will be explained now.

The debt-equity and debt to total capital ratios indicate whether there is sufficient safety margin available to the creditors. But normally the assets of the firm will not be sold to satisfy the claims of the creditors. The claims are usually met out of the regular earnings or operating profits of the firm. These claims include interest of loans, Preference dividend, repayment of the loan (either in a lump sum or in installments) and redemption of Preference shares. From the viewpoint of long term creditors, the financial soundness of the firm lies in its ability to service their claims. This ability is revealed by the coverage ratios. Thus coverage ratios may be defined as the ratios which measure the ability of the firm to service fixed interest loans and other Preference securities.

While D-E ratios are calculated from the Balance Sheet data, the coverage ratios are computed from items of the Income Statements.

1. Interest Coverage Ratio

This ratio is also known as “times-interest-earned ratio”. This is one of the most conventional coverage ratios used for knowing the firm’s debt

servicing capacity. This ratio is obtained by dividing earnings (or Net Profit) before interest and taxes (EBIT) by the fixed interest charges on loans.

$$\text{Interest Coverage} = \frac{EBIT}{\text{Interest}}$$

This ratio shows how many times the interest charges are covered by the EBIT which are ordinarily available for paying the interest charges. This ratio indicates the extent to which the earnings of the firm may fall without adversely affecting its debt servicing capacity. A higher coverage ratio is desirable from the point of view of creditors. But too high a ratio indicates that the firm is very conservative in using debt. On the other hand, a low coverage ratio indicates excessive use of debt or inefficient operations.

2. Dividend Coverage Ratio

This ratio measures the ability of a firm to pay dividend on the Preference shares which is usually a limited percentage. This ratio is expressed in terms of 'times', i.e., the profit after tax is X times the preference dividend.

$$\text{Dividend Coverage} = \frac{\text{Profit after tax}}{\text{Preference dividend}}$$

This ratio indicates the safety margin available to the Preference shareholders.

3. Total Coverage Ratio or Fixed Charges Coverage

This ratio has a wider coverage than the earlier two ratios. It takes into account all the fixed obligations of the firm, viz., interest on loans, preference dividend and repayment of the principal. This ratio is calculated by dividing the Earnings Before Interest and Taxes (EBIT) by the total fixed charges.

$$\text{Total Coverage} = \frac{EBIT}{\text{Total fixed charges}}$$

The higher the coverage, the better is the ability of the firm to service debt.

It is difficult to establish a norm for the coverage of fixed charges. Much depends upon the trade custom and the nature of the business. However, a ratio of 6 to 7% of net profit before tax or 3% of net profit after tax is taken standard for industrial firms. For utility undertakings the ideal ratio is 4% of the net profits before tax and 2% of the net profits after tax.

A dividend coverage ratio of at least 2 is expected to act as the standard for reference level.

Illustration -3

From the following particulars calculate the coverage ratios:

Net Profit	Birr 300, 000
Income tax	Birr 252, 000
Interest	Birr 46, 000
Preference dividend	Birr 32, 000

Solution

$$\text{Interest Coverage Ratio} = \frac{EBIT}{\text{Interest}}$$

$$= \frac{\text{Birr}300000 + \text{Birr}252000 + \text{Birr}46000}{\text{Birr}46000} = \frac{\text{Birr}598000}{\text{Birr}46000} =$$

13 times

$$\text{Dividend Coverage} = \frac{\text{Earnings After Tax}}{\text{Preference Dividend}}$$

$$= \frac{\text{Birr}300000}{\text{Birr}32000} = 9.37 \text{ times}$$

$$\text{Fixed Coverage} = \frac{EBIT}{\text{Total Fixed Charges}}$$

$$= \frac{\text{Birr}598000}{\text{Birr}46000 + \text{Birr}32000} = \frac{\text{Birr}598000}{\text{Birr}78000} = 7.67 \text{ times}$$

Check Your Progress -3

1. What for interest coverage ratio useful?

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2. What does dividend coverage ratio measure?

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4.8 LIQUIDITY RATIOS

Liquidity is the ability of a firm to meet its current or short-term obligations when they become due. Every firm should maintain adequate liquidity. Liquidity is also known as short-term solvency of the firm. The short-term creditors of the firm are interested in the short-term solvency or liquidity of the firm. The liquidity position is better known with the help of cash budgets and cash flow statements. But liquidity ratios also provide a quick measure of the liquidity of the firm. The liquidity ratios or short-term solvency ratios establish a relationship between cash and current assets to current liabilities. A firm's liquidity should neither be too low nor too high but should be adequate. Low liquidity implies the firm's inability to meet its obligations. This will result in bad credit rating, loss of the creditors' confidence or even technical insolvency ultimately resulting in the closure of the firm. A very high liquidity position is also bad, it means the firm's current assets are too large in proportion to maturity obligations. It is obvious that idle assets earn nothing to the firm; and in situations of high liquidity, the firm's funds will be unnecessarily tied up in current assets, which, if released, can be used to generate profits to the firm. Therefore, every firm should strike a balance between liquidity and lack of liquidity.

The ratios which measure and indicate the extent of liquidity of a firm and known as liquidity ratios or short-term solvency ratios. They include current ratio, quick ratio or acid test ratio, and cash position ratio. There is also another measure which is frequently employed to know the liquidity position of a firm. The measure is the net working capital which represents excess current assets over current liabilities. The net working capital, strictly, speaking, is not a ratio. Hence it is not discussed here.

In all the ratios of liquidity, it is the current assets and the current liabilities and the relationship between them that are analyzed. So it is better to know what the current assets and current liabilities are and then proceed to study the different liquidity ratios.

Current assets include cash and those assets, which in the normal course of business get converted into cash within a year or the accounting periods: e.g., cash, marketable-securities, debtors, stock, etc. Prepaid expenses should also be included in the current assets because they represent the payments which have been made by the firm for the near future.

Current liabilities are those liabilities or obligations which are to be paid within a year. They include creditors, bills payable, accrued expenses, bank overdraft, income tax liability and long term debt maturing in the current year.

1. Current Ratio

Current ratio is the ratio of total current assets to total current liabilities. It is calculated by dividing current assets by current liabilities.

$$\text{Current ratio} = \frac{\text{Current assets}}{\text{Current liabilities}}$$

This ratio is also called 'working capital ratio' because it is related to the working capital of the firm. The current ratio is an important and most commonly used ratio to measure the short-term financial strength or solvency of the firm. It indicates how many rupees of current assets are

available for one rupee of current liability. The higher the current ratio, the more is the firm's ability to meet its current obligations and the greater the safety of the funds of the short-term creditors. Thus the current ratio, in a way, provides a margin of safety to the (short-term) creditors.

To the question, "What should be the current ratio of a firm?" there is no clear-cut answer, nor is there any hard and fast rule for deciding it. Conventionally (The rule of thumb), a current ratio of 2:1 is considered satisfactory. This rule is based on the logic that even in the worst situation where the value of current assets is reduced by fifty percent, the firm will be able to meet its current obligations. The standard norm for the current ratio (i.e. 2:1) may vary from firm to firm, industry to industry or for a firm from time to time. As such, this norm of 2:1 should not be blindly followed. Also, it should be remembered that this current ratio is a crude measure of liquidity. It is a quantitative rather than a qualitative index of liquidity. It takes into account the total value of current assets without making any distinction between the various types of current assets like receivables, stocks and so on. It does not measure the quality of these assets. If the firm's current assets include doubtful and slow paying receivables or slow moving and non-moving (non-saleable) stock of goods, then the firm's ability to meet obligations would be reduced. This aspect is ignored by the current ratio. That is why too much reliance should not be placed on the current ratio. The ability of the assets also should be ascertained.

Illustration -4

The assets and liabilities of a firm as on the 31st of Dec., 2000 were as under. Calculate the current ratio and its net working capital.

Assets	Birr	Liabilities & Capital	
Birr			
Plant	4, 000, 000	Share Capital	3,
000, 000			
Buildings	2, 000, 000	Reserves & Surplus	800,
000			
Stock	1, 500, 000	Debentures	3,
000, 000			
Receivables	1, 000, 000	Creditors	
600, 000			
Prepaid Expenses	250, 000	Bills Payable	
200, 000			
Marketable Securities	750, 000	Accrued Expenses	
200, 000			
Cash	2, 500	Provision for Taxation	650, 000
		Long Term Loan	1, 300, 000

Solution

For calculating the current ratio we need to know the current assets and current liabilities

Current Assets	Birr	Current Liabilities	
Birr			
Cash	250, 000	Creditors	600, 000
Mkt. Securities	750, 000	Bills Payable	200,
			000
Debtors	1, 000, 000	Accrued Expenses	200,
			000
Stock	1, 500, 000	Provision for Taxation	
650, 000			

Prepaid Expenses	250,000
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<u>3,750,000</u>	<u>1,650,000</u>
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$$\text{Current Ratio} = \frac{\text{Current Assets}}{\text{Current Liabilities}} = 2.75:1$$

$$\begin{aligned} \text{Net working capital} &= \text{Current Assets} - \text{Current Liabilities} \\ &= \text{Birr } 3,750,000 - \text{Birr } 1,650,000 = \text{Birr } 2,100,000 \end{aligned}$$

2. Quick Ratio or Acid Test Ratio

This ratio measures the relationship between Quick assets (or liquid assets) and current liabilities. An asset is considered liquid if it can be converted into cash without loss of time or value. Cash is the most liquid asset. Other assets which are considered to be relatively liquid and include in the quick assets are accounts receivable (i.e. debtors and bills receivable) and short term investments in securities. Stock or inventory is excluded because it is not easily and readily convertible into cash. Similarly, prepaid expenses, which cannot be converted into cash and be available to pay off current liabilities, should also be excluded from liquid assets.

The quick ratio is calculated by dividing quick assets by current liabilities:

$$\text{Quick Ratio} = \frac{\text{Quick Assets}}{\text{Current Liabilities}}$$

Quick ratio is a more refined and vigorous measure of the firm's liquidity. It is widely accepted as the best test for the liquidity of a firm.

Generally, a quick ratio of 1:1 is considered to be satisfactory. But this ratio also should be used cautiously. It should also be subjected to qualitative tests, i.e., quality of the assets included should be assessed.

Illustration -5

Taking the same particulars of assets and liabilities given in illustration -4 of the unit, calculate the quick ratio.

Solution

Quick Assets	Birr	Current Liabilities	Birr
Cash	250, 000	Current Liabilities	1, 650, 000
Securities	750, 000		
Debtors	1, 000, 000		
	2, 000, 000		

$$\text{Quick Ratio} = \frac{\text{Quick assets}}{\text{Current liabilities}} = \frac{\text{Birr } 2,000,000}{\text{Birr } 1,650,000} = 1.21:1$$

3. Cash Position Ratio

This is also known as 'super quick ratio' or 'super acid test ratio'. It is a still more rigorous test of liquidity. For calculating this ratio, from the total quick assets the accounts recoverable (debtors and bills receivable) will also be excluded.

$$\text{Cash Position Ratio} = \frac{\text{Cash} + \text{Short Term Investments}}{\text{Current Liabilities}}$$

The standard norm for this ratio, too, is 1:1.

This ratio is a conservative test of liquidity and is not widely used in practice.

By taking the particulars of assets and liabilities given in Illustration -1, the cash position ratio of the firm can be calculated thus:

$$\begin{aligned}\text{Cash Position Ratio} &= \frac{\text{Cash} + \text{Securities}}{\text{Current Liabilities}} \\ &= \frac{\text{Birr } 1,000,000}{\text{Birr } 1,650,000} = 0.61:1\end{aligned}$$

Check Your Progress -4

1. Give two examples of liquidity ratios.

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2. Name three current assets.

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3. List out three current liabilities.

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4. How is current ratio calculated?

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5. What does quick ratio measure?

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4.9 ACTIVITY RATIOS

The finances obtained by a firm from its owners and creditors will be invested in assets. These assets are used by the firm to generate sales and profits. The amount of sales generated and the obtaining of the profits depend on the efficient management of these assets by the firm. Activity ratios indicate the efficiency with which the firm manages and used its assets. That is why these activity ratios are also known as 'efficiency ratios'. They are also called 'turnover ratios' because they indicate the speed with which assets are being converted or turned over into sales. Thus the activity or turnover ratio measures the relationship between sales on one side and various assets on the other. The underlying assumption here is that there exists an appropriate balance between sales and different

assets. A proper balance between sales and different assets generally indicates the efficient management and use of the assets. Many activity ratios can be calculated to know the efficiency of asset utilization. The following are some of the important activity ratios or turnover ratios:

1. Total Assets Turnover Ratio

This ratio measures the overall performance and efficiency of the business enterprise. It points out the extent of efficiency in the use of assets by the firm. This ratio is calculated by dividing the annual sales value by the value of total assets. Normally, the value of sales should be considered to be twice that of the assets. A lower ratio than this indicates that the assets are lying idle while a higher ratio may mean that there is overtrading. Sometimes, intangible assets (goodwill, patents, etc) are excluded from the total assets and the total tangible assets-turnover ratio is calculated. For calculating this ratio fictitious assets (P & L A/c debit balance, deferred expenditure, etc) should be ignored.

2. Capital Employed Turnover

This is also known as 'Sales-Net worth Ratio'. The capital employed is equal to the non-current liabilities plus the owners' equity. This represents the permanent capital or long term funds entrusted to the firm for use by the owners and creditors. The capital employed can be treated as equivalent to the net working capital plus the non-current assets. This ratio examines the effectiveness in utilizing the capital employed. It is calculated by dividing the sales value by the capital employed.

Thus the ratio indicates the firm's ability to generate sales per rupee of the capital employed (long term funds). The higher the ratio, the more efficient the utilization of the owners' and the long term creditors' funds. This ratio of a firm should be compared with the industry average or similar ones.

If the Sales-Net worth ratio of a firm is found to be excessively large in comparison to that of similar firms or the industry average, it is said to be a case of overtrading, i.e., the handling of a larger turnover than is warranted by its net worth.

The efficiency of the operations of a firm need not be ascertained solely on the basis of this ratio. Other ratios which are related to it also should be considered.

3. Fixed Assets - Turnover Ratio

This ratio measures the firm's efficiency in utilizing its fixed assets. Firms which have large investments in fixed assets usually consider this ratio important. It indicates the extent of capacity utilization in the firm. The ratio is calculated by dividing the total value of sales by the amount of fixed assets invested. A high ratio is an indicator of overtrading while a low ratio suggests idle capacity or excessive investment in fixed assets. Normally, a ratio of five times is taken as a standard.

Some analysts suggest the exclusion on intangible assets like goodwill, patents, etc., for calculating this ratio. For calculating this ratio, the gross fixed assets figure is preferred to the net value figure.

4. Current Assets Turnover

This ratio is calculated by dividing the net sales value by that of the current assets. It indicates the contribution of current assets to the sales.

5. Working Capital Turnover

This ratio indicates the efficiency of the employment of working capital. If supplemented with the net worth turnover ratio, it indicates the under capitalization of the overtrading of the concern. A firm is said to be undercapitalized if its return on capital is unusually high when compared to similarly situated firms. This ratio is calculated by dividing the net sales

value by the net working capital. There is no standard norm for this ratio. It can only be stated that the firm should have adequate and appropriate working capital to justify the sales generated.

6. Stock Turnover or Inventory Turnover

This ratio indicates the efficiency of the firm's inventory management. It is calculated by dividing the cost of goods sold by the average inventory.

$$\text{Stock Turnover} = \frac{\text{Cost of goods sold}}{\text{Average stock}}$$

Cost of goods sold = Sales - Gross Profit or

Opening Stock + Purchases + Mfg. Costs - Closing Stock.

Average Stock = (Opening Stock + Closing Stock) ÷ 2.

If the particulars of cost of goods sold and average stock are not available in the published financial statements the stock turnover can be calculated by dividing sales by the stock at the end, i.e.,

$$\text{Inventory Turnover} = \frac{\text{Sales}}{\text{Closing Stock}}$$

Between the two formulae given above for calculating the stock turnover the former is more logical and more appropriate than the latter.

This ratio indicates the rapidity with which the stock is turning into receivables through sales. Generally, a high inventory turnover is an index of good inventory management and a low inventory turnover indicates an inefficient inventory management. Low stock turnover implies the maintenance of excessive stocks which are not warranted by production and sales activities. It also may be taken as an indication of slow moving or non-moving and obsolete inventory. A too high inventory turnover also is not good. It may be the result of a very low level of stocks which may result in frequent stock-outs. The stock turnover should be neither too high nor too low.

Illustration -6

The sales of a firm amounted to Birr 600, 000 in a particular period on which it had a gross margin of 20%. The stock at the beginning of the period was worth Birr 70, 000 and at the end of the period of Birr 90, 000. Calculate the inventory turnover ratio.

Solution

$$\begin{aligned}\text{Inventory turnover} &= \frac{\text{Cost of goods sold}}{\text{Average inventory}} \\ &= \frac{\text{Birr } 600,000 - 120,000}{(\text{Birr } 70,000 + \text{Birr } 90,000) \div 2} = \frac{\text{Birr } 480,000}{\text{Birr } 80,000} = 6 \text{ times}\end{aligned}$$

7. Debtors Turnover

Credit sales are not an uncommon feature. When the firm sells goods on credit, book debts (receivables) are created. Debtors are expected to be converted into cash over a short period and hence are included in current assets. To a great extent the quality of debtors determines the liquidity position of the firm. The quality of debtors can be judged on the basis of debtors turnover and average collection period.

Receivable turnover is calculated by dividing credit sales by average receivables

$$\text{Receivables turnover} = \frac{\text{Credit sales}}{\text{Average receivables}}$$

This ratio indicates the number of times on an average the debtors or receivables turnover each year are created. The higher the value of debtors turnover, the more efficient is the management of assets.

If the information about credit sales opening and closing balances of receivables is not available in the financial statements, the receivables turnover can be calculated by taking the total sales and closing balance of receivables

$$\text{Debtors turnover} = \frac{\text{Total sales}}{\text{Receivable}}$$

Illustration -7

The total sales of a firm amounted to Birr 600, 000 during a year out of which the cash sales amounted to Birr 200, 000. The outstanding amounts of debt at the beginning and at the end of the year were Birr 30, 000 and Birr 40, 000 respectively. Calculate the receivables turnover ratio.

Solution

$$\begin{aligned}\text{Receivables Turnover} &= \frac{\text{Credit sales}}{\text{Average debtor}} \\ &= \frac{\text{Birr } 400,000}{(\text{Birr } 30,000 + \text{Birr } 40,000) \div 2} = \frac{\text{Birr } 400,000}{\text{Birr } 35,000} = 11.4 \text{ times}\end{aligned}$$

8. Average Collection Period

As stated earlier the average collection period ratio is another device for indicating the quality of receivables. This ratio shows the nature of the firm's credit policy also. The average collection period is calculated by dividing days (or months) in a year by the receivables' turnover.

$$\text{Average Collection Period} = \frac{\text{Days in a year} / 12 \text{ month}}{\text{Receivable Turnover}}$$

The average collection period and the receivables' turnover are interrelated. The receivables turnover can be calculated by dividing days in the year by the average collection period.

The average collection period indicates the rigidity or slowness of their collectibility. The shorter the period, the better the quality of debtors, since the shorter collection period implies prompt payment by debtors. The firm's average collection period should be compared with the firm's credit terms and policy to judge its credit and collection policy. An excessively long collection period implies a too liberal and inefficient credit and collection performance while a too low period indicates a very restrictive or strict

credit and collection policy. The firm's average collection period should be reasonable and not totally different from that of the industry's average.

Taking the particulars of Illustration -7, the average collection periods may be calculated thus:

$$\text{Average Collection Period} = \frac{365}{11.4} = 32 \text{ days.}$$

Check Your Progress -5

1. What is Total Assets Turnover Ratio?

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.....
.....

4.10 PROFITABILITY RATIOS

Every firm should earn adequate profits in order to survive in the immediate present and grow over a long period of time. In fact, the profit is what makes the business firm run. It is described as the magic eye that mirrors all aspects of the business operations of the firm. Profit is also stated as the primary and final objective of a business enterprise. It is also an indicator of the firm's efficiency of operations. There are different persons interested in knowing the profits of the firm. The management of the firm regards profits as an indication of efficiency and as a measure of control. Owners take it as a measure of the worth of their investment in the business. To the creditors profits are a measure of the margin of safety. Employees look at profits as a source of fringe benefits. To the government

they act as a measure of the firm's tax paying ability and a basis for legislative action. To the customers they are a hint for demanding price cuts. To the firm they constitute a less cumbersome and low cost source of finance for existence and growth. Finally, to the country profits are an index of the economic progress, the national income generated and the rise in the standard of living of the people. Therefore, every firm should earn sufficient profits in order to discharge its obligations to the various persons concerned.

Profitability means the ability to make profits. Profitability ratios are calculated to measure the profitability of the firm and its operating efficiency. They relate profits earned by a firm to different parameters like sales, capital employed, and net worth. But while making financial ratio analysis relating to profits, it should be noted that there are different concepts of profits such as contribution (sales revenue minus variable costs), gross profit, profit before tax, profit after tax, profit before interest and taxes, operating profit, profit has to be used for making the profitability analysis suitable for analyzing specific problems. Profitability ratios can be calculated with reference to the different concepts of profit mentioned earlier.

Profitability of the firm can be measured by calculating several interrelated ratios demanded by the aims of the analyst. The profitability of a firm can be measured and analyzed from the point of view of management, owners (i.e., shareholders in the case of companies) and creditors.

From the management point of view, profitability ratios are calculated for measuring the efficiency of operations. There are two types of profitability ratios calculated for this purpose. They are:

- I. Profitability in relation to sales, and
- II. Profitability in relation to investment.

Every firm should generate sufficient profit on each Birr of sales otherwise it would be very difficult for the firm to recover operating expenses and non-operating expenses like interest charges. Similarly, if the firm's earnings are not adequate in terms of its investment in assets and in terms of capital employed (contributions by owners and creditors) its very survival will be at stake.

I. Profitability in relation to sales

Under this category many profitability ratios are calculated relating different concepts of profit to the sales value. Some such ratios are:

1. Gross Profit margin or Gross Profit to Sales

This ratio is calculated by dividing gross profit by sales value.

$$\text{Gross profit margin} = \frac{\text{Gross profit}}{\text{Sales}} = \frac{\text{Sales} - \text{Cost of goods sold}}{\text{Sales}}$$

This ratio is usually expressed as a percentage. It indicates the efficiency with which management produces each unit of product or service. It reveals the spread (difference) between sales value and cost of goods sold. A high gross profit margin (compared to the industry average) indicates relating lower cost of production of the firm concerned. It is an index of good management. A lower gross margin indicates higher cost of goods sold (which might be due to purchase of unfavorable items inefficient utilization of plant and machinery or over-investment in plant, machinery and equipment), or lower sales values (which could be due to fall in prices in the market, reduction in selling price, less volume of sales, etc.)

2. Gross Operating Margin

This ratio is calculated by dividing gross operating margin by sales.

Gross operating margin = Gross profit minus operating expenses except depreciation.

This ratio indicates the extent to which the selling price per unit may decline without incurring any loss in the business operations. It is rather difficult to evolve a standard norm for this ratio. But it should not be lower than that of similar concerns.

Example: Sales: Birr 1, 000, 000; Gross profit: Birr 500, 000; Operating expenses excluding depreciation: Birr 100, 000; Depreciation: Birr 10, 000.

$$\text{Gross operating margin} = \frac{\text{Birr}500000 - \text{Birr}100000}{\text{Birr}1,000,000} = 40\%$$

3. Net Operating Margin

This ratio is calculated by dividing the net operating profit by (net) sales. The net operating profit is obtained by deducting depreciation from the gross operating profit. Taking the particulars of the example given above, the net operating margin may be calculated as follows:

$$\begin{aligned} \text{Net Operating Margin} &= \frac{\text{Gross Operating Profit} - \text{Depreciation} \times 100}{\text{Sales}} \\ &= \frac{\text{Birr}400000 - \text{Birr}10000}{\text{Birr}1,000,000} = 39\% \end{aligned}$$

For this ratio no standard norm is evolved. The ratio of a firm may be compared with that of sister concerns to measure the relative position.

4. Net Profit Margins or Net Profit to Sales

This is one of the very important ratios and measures the profitability of sales. It is calculated by dividing the net profit by sales. The Net profit is obtained by subtracting operating expenses and income tax from the gross profit. Generally, non-operating incomes and expenses are excluded for calculating this ratio. This ratio measures the ability of the firm to turn each Birr of sales into net profit. It also indicates the firm's capacity to withstand adverse economic conditions. A high net profit margin is a welcome feature to a firm and it enables the firm to accelerate its profit at a faster rate than a firm with a low net profit margin.

In order to have a more meaningful interpretation of the profitability of a firm, both gross margin and net margin should jointly be evaluated. If the gross margin has been on the increase without a corresponding increase in net margin, it indicates that the operating expenses relating to sales have been increasing. The analyst should further analyze in order to find out the expenses which are increasing. The net profit margin can remain constant or increase with a fall in gross margin only if the operating expenses decrease sufficiently.

5. Operating Ratio

The ratio is an index of the operating efficiency of the firm. It explains the changes in the net profit margin. This ratio is calculated by dividing all operating expenses (i.e., cost of goods sold plus administration and selling expenses) by sales.

$$\text{Operating ratio} = \frac{\text{Cost of goods sold} + \text{Operating expense}}{\text{Sales}}$$

This ratio is also expressed as a percentage.

A higher operating ratio is always unfavorable because it would leave only a small amount of operating income for meeting non-operating expenses (like interest) dividends, etc. In order to get an idea about the operating efficiency of the firm, this ratio over a number of years should be studied. Variations on the operating ratio occur because of many factors such as changes in operating expenses and cost of goods sold, changes in sale price or demand for the product and volume of sales. Thus there are both internal and external (and uncontrollable) factors which influence the operating ratio of a firm. As such, this ratio should be used cautiously. This ratio again cannot be of much use to firms where the non-operating incomes and expenses constitute a significant part of the total income.

Example

Sales: Birr 2, 000, 000; Opening Stock: Birr 200, 000; Manufacturing cost: Birr 1, 000, 000; Closing Stock: Birr 150, 000; Administrative Expenses: Birr 50, 000; Selling Expenses: Birr 40,000; Depreciation: Birr 40, 000. Calculate the operating ratio.

Solution

$$\begin{aligned}\text{Operating Ratio} &= \frac{\text{Cost of goods sold} + \text{Operating expense}}{\text{Sales}} \\ &= \frac{(\text{Birr } 2,000,000 - \text{Birr } 200,000 + \text{Birr } 1,000,000) + (\text{Birr } 50,000 + \text{Birr } 40,000 + \text{Birr } 40,000)}{\text{Birr } 2,000,000} \\ &= \frac{\text{Birr } 1,050,000 + \text{Birr } 130,000}{\text{Birr } 2,000,000} = \frac{\text{Birr } 1,180,000}{\text{Birr } 2,000,000} = 0.59 \text{ or } 59\%\end{aligned}$$

Expense Ratios

The operating ratio gives an aggregate picture of the operating efficiency of the firm. To know how individual expense items behave, the ratio of each individual operating expense to sales should be calculated. These ratios, when studied over a period of years, help in knowing the managerial efficiency in the fields of operations concerned. Taking the particulars of the example given for operating ratio, calculation of different ratios can be as follows:

$$\text{Cost of goods sold to Sales} = \frac{\text{Birr } 1,050,000}{\text{Birr } 2,000,000} = 52.5\%$$

$$\text{Administrative expenses to Sales} = \frac{\text{Birr } 50,000}{\text{Birr } 2,000,000} = 2.5\%$$

$$\text{Selling Expenses to Sales} = \frac{\text{Birr } 40,000}{\text{Birr } 2,000,000} = 2.00\%$$

$$\text{Depreciation to Sales} = \frac{\text{Birr } 40,000}{\text{Birr } 2,000,000} = 2.00\%$$

Illustration -8

Calculate the profitability ratios relating to sales from the following Income Statement of S.S.PLC.

Income Statement for the year ending on ...

	Sales		2, 000, 000
(-)	Cost of Goods		<u>1, 400, 000</u>
	Gross Profit		600,000
(-)	Operating Expenses:		
	Office	50, 000	
	Selling & Distribution	<u>20, 000</u>	
			<u>70, 000</u>
	Gross Operating Margin		530, 000
(-)	Depreciation		<u>130, 000</u>
	Net Operating Profit		400, 000
+	Non-operating income	10, 000	
(-)	Non-operating exp. Int.	<u>20, 000</u>	
			10, 000
	Net Profit before tax		390, 000
(-)	Income Tax (50%)		<u>195,000</u>
	Profit After Tax		<u>195,000</u>

Solution

$$\text{Gross Profit Margin} = \frac{\text{Gross Profit}}{\text{Sales}} \times 100 = \frac{\text{Birr}600000}{\text{Birr}2000000} \times 100 = 30\%$$

$$\text{Gross Operating Profit Margin} = \frac{\text{Gross Operating Profit}}{\text{Sales}} = \frac{\text{Birr}530000}{\text{Birr}2,000000} \times 100 = 26.5\%$$

$$\text{Net Operating Profit} = \frac{\text{Net Operating Profit}}{\text{Sales}} = \frac{\text{Birr}400000}{\text{Birr}2,000000} = 20\%$$

$$\text{Net Profit Margin} = \frac{\text{Net Profit After Tax}}{\text{Sales}} = \frac{\text{Birr}195000}{\text{Birr}2,000000} = 9.75\%$$

$$\begin{aligned} \text{Operating Ratio} &= \frac{\text{Cost of goods sold} + \text{Operating Expense}}{\text{Sales}} \\ &= \frac{\text{Birr}1,400000 + \text{Birr}50000 + \text{Birr}20000 + \text{Birr}130000}{\text{Birr}2,000000} \\ &= \frac{\text{Birr}1,600000}{\text{Birr}2,000000} = 80\% \end{aligned}$$

$$\text{Cost of goods sold to Sales} = \frac{\text{Birr}1,400000}{\text{Birr}2,000000} = 70\%$$

$$\text{Office Expenses to Sales} = \frac{\text{Birr}50000}{\text{Birr}2,000000} = 2.5\%$$

$$\text{Selling and distribution expenses to Sales} = \frac{\text{Br. } 20000}{\text{Br. } 2,000000} = 1.00\%$$

$$\text{Depreciation to Sales} = \frac{\text{Br. } 130000}{\text{Br. } 2,000000} = 6.5\%$$

Profitability of a firm in relation to sales can also be analyzed by calculating the activity of turnover ratios which have already been explained in the earlier unit.

II. Profitability in Relation to Investment

Profitability of a firm can also be measured in terms of the investment made. The term, 'investment', may refer to total assets, total operation assets, capital employed or the owners' equity. Accordingly, many profitability ratios in relation to investment can be calculated. The important ratios in relation to investment can be calculated. The important ratios are discussed here under:

1. Return on assets

This ratio is calculated by dividing net profit after tax by total assets:

$$\text{Return On Assets (ROA)} = \frac{\text{NetProfitAfterTax}}{\text{TotalAssets}}$$

There are many variations on the return on assets ratio mix depending on the particular concept of net profit and assets used. The different concepts of net profit used include net profit after tax, net profit after tax plus interest (on loans), net operating profit, and net profit after taxes plus interests minus tax savings.

Similarly, the concept 'assets' may indicate total assets, fixed assets, tangible assets, operating assets, etc.

The different variants of the Return on Assets may be as under:

$$\begin{aligned}\text{Return on Assets} &= \frac{\text{NetProfitAfterTax}}{\text{TotalAssets}} \\ &= \frac{\text{NetProfitAfterTax} + \text{Interest}}{\text{TotalAssets}} \\ &= \frac{\text{NetProfitAfterTax} + \text{Interest}}{\text{TangibleAssets}} \\ &= \frac{\text{NetProfitAfterTax} + \text{Interest}}{\text{FixedAssets}} \\ &= \frac{\text{OperatingProfit}}{\text{OperatingAssets}}\end{aligned}$$

Operating assets are the assets which are used in the regular conduct of the business operations. They include mostly tangible fixed assets and current assets. Investments are generally excluded when calculating the operating assets.

This Return on Assets ratio measures the profitability of the total assets (or investment) of a firm. But this ratio does not throw any light on the profitability of the different sources of funds which have financed the total

assets. This aspect of profitability is covered by Return on capital employed.

2. Return on Capital Employed

This is similar to ROA except that in this ratio profits are related to the capital employed. The term, 'capital', employed refers to the long-term funds supplied by creditors and owners of the firm. This ratio indicates how efficiently the management of the firm has used the funds supplied by creditors and owners. The Capital employed can be ascertained in two ways by taking the non-current liabilities plus owners' equity or by considering the net working capital plus net fixed assets. The higher the ratio ROCE, the more efficient has been the use of capital (long term funds) employed.

The Return on capital employed can be calculated by using different concepts of profit and capital employed.

$$\begin{aligned} \text{ROCE} &= \frac{\text{NetProfitAfterTax}}{\text{TotalCapitalEmployed}} \\ &\text{or} \\ &= \frac{\text{NetProfitAfterTax} + \text{Interest}}{\text{TotalCapitalEmployed}} \\ &= \frac{\text{NetProfitAfterTax} + \text{Interest}}{\text{TotalCapitalEmployed} - \text{IntangibleAsset}} \end{aligned}$$

Illustration -9

From the following particulars calculate the profitability ratios in terms of investment:

Balance Sheet as on ...			
	Birr		Birrs
Plant & Machinery	1, 200, 000	Equity Share	
Goodwill	150, 000	Capital	500, 000
Current Assets	350, 000	(50, 000	300, 000

	shares)	200, 000
	8% Preference	200, 000
	Capital	300, 000
	Reserves &	200, 000
	<u>1,700, 000</u> Surplus	<u>1, 700,</u>
	8% Long-term	<u>000</u>
	Loans	
	8% Debentures	
	Current Liabilities	

Net profit after tax: Birr 200, 000; interest: Birr 40, 000

Solution

Capital employed = Non-current Assets + Net Working Capital
= 1, 350, 000 + (350, 000 - 200, 000) = Birr 1, 500, 000

or

Long Term Funds + Owners' Equity
= Birr 500, 000 + Birr 1, 000, 000 = Birr 1, 500, 000

$$ROCE = \frac{\text{ProfitAfterTax}}{\text{CapitalEmployed}} = \frac{\text{Br. } 200000}{\text{Br. } 1,500000} = 13.35\%$$

$$ROCE = \frac{\text{ProfitAfterTax} + \text{Interest}}{\text{CapitalEmployed}} \\
= \frac{\text{Br. } 200000 + \text{Br. } 40000}{\text{Br. } 1,500000} = \frac{\text{Br. } 240000}{\text{Br. } 1,500000} = 16\%$$

$$ROCE = \frac{\text{ProfitAfterTax} + \text{Interest}}{\text{CapitalEmployed} + \text{Intangible Asset}} \\
= \frac{\text{Br. } 240000}{\text{Br. } 1,500000 + \text{Br. } 150000(\text{goodwill})} = \frac{\text{Br. } 240000}{\text{Br. } 1,650000} = 14.55\%$$

The Profitability of the firm can be judged from the owners' point of view also. In the case of the company's shareholders the ordinary or common shareholders specially represent ownership. While analysis the profitability, the shareholders are interested in the net profits accruing to them, the dividend policy of the firm, earnings per share, growth in the earnings,

impact of earnings on the market price of shares, etc. They also conduct certain market tests of profitability. Some important ratios of profitability from the shareholders' point of view are presented here.

3. Return on Shareholders' Equity

The shareholders of a company may comprise equity shareholders and Preference shareholders. Preference shareholders are the shareholders who have a priority in receiving dividends (and in the return of capital at the time of winding up of the company). The rate of dividend on the preference shares is fixed. But the ordinary or common shareholders are the residual claimants of the profits and ultimate beneficiaries of the company. The rate of dividend on these shares is not fixed. When the company earns profits it may distribute all or a part of the profits as dividends to the equity shareholders or retain them in the business itself. But the profits after taxes and after Preference Shares dividend payment presents the return as equity of the shareholders.

A return on shareholders' equity is calculated to assess the profitability of the owners' investment. The shareholders' equity is ascertained by adding up equity Share capital, Preference share capital, share premium, reserves and surplus. If any accumulated losses are there, they should be deducted from this amount. The shareholder's equity is also called net worth.

Return on shareholders' equity or return on net worth is calculated by dividing the net profit after tax by the total shareholders' equity or net worth.

$$\text{Return on shareholders' equity} = \frac{\text{Net Profit After Taxes}}{\text{Shareholders' Equity}}$$

Example:

Taking the particulars given in Illustration 9, the shareholders' equity and return on it are calculated here:

Shareholders' equity = Equity share capital + Pref. Share Capital + Res. & Surplus

$$= \text{Br. } 500,000 + \text{Br. } 300,000 + \text{Br. } 200,000 + \text{Br. } 1,000,000$$

$$\text{Return on shareholders' equity} = \frac{\text{Br. } 200,000}{\text{Br. } 1,000,000} = 20\%$$

This ratio reveals how profitability owners' funds have been utilized by the firm. A comparison of this ratio with that of similar firms and with the industry average reveals the relative financial soundness and performance of the firm.

4. Return on Equity Shareholders' Funds

The real shareholders of a company are its equity shareholders who are the ultimate owners. They are entitled to all the profits remaining after all outside claims are met and preference dividend paid. In view of this, the profitability of a firm should be assessed in terms of return to the equity shareholders. It is calculated by dividing profits after taxes and preference dividend by the equity.

$$\text{Return on equity shareholders funds} = \frac{\text{Profit After Tax} - \text{Pref Dividend}}{\text{Equity Shareholders' Equity}}$$

Equity shareholders' equity is total shareholders' equity minus Preference shareholders' equity. It can also be calculated as ordinary paid up share capital plus share premium plus reserves and surplus less accumulation losses.

Example: Taking the particulars of Illustration -9 equity shareholders' funds will be as under:

$$\begin{aligned} \text{Return on equity shareholders equity} &= \frac{\text{Profit After Tax} - \text{Pref Dividend}}{\text{Equity Sh Cap} + \text{Reserve \& Surplus}} \\ &= \frac{\text{Br. } 200,000 - \text{Br. } 24,000}{\text{Br. } 500,000 + \text{Br. } 200,000} = \frac{\text{Br. } 176,000}{\text{Br. } 700,000} = 25.14\% \end{aligned}$$

5. Earnings Per Share (EPS)

EPS is another measure of profitability of a firm from the point of view of the ordinary shareholders. It reveals the profit available to each ordinary share. It is calculated by dividing the profit available to ordinary shareholders, (i.e., profit after tax minus Preference dividend) by the number of outstanding equity shares.

$$\text{EPS} = \frac{\text{Profit After Tax} - \text{Pref Dividend}}{\text{No of Equity Shares Outstanding}}$$

The EPS of the firm the particulars of which are given in Illustration -9 is calculated as under:

$$\text{EPS} = \frac{\text{Br.176000}}{50000} = \text{Br.3.52}$$

The EPS of a firm studied over years indicates whether or not the earnings per share basis has changed over the period. To assess the relative profitability of the firm its EPS should be compared with that of similar concerns and the industry average.

EPS is a widely used ratio, specially for analyzing the effect of a change in leverage on the net operating earnings to the equity shareholders. This analysis is of immense value in evolving an appropriate capital structure for a firm.

6. Dividend Per Share (DPS)

The net profits after taxes and Preference dividend belong to the equity shareholders and EPS reveals how much of it is it per share. But no company is under the obligation to distribute all the profits as dividends to the shareholders. In pursuance of the policy which the company has evolved it may retain all or some profits and distribute the balance as dividends. A large number of potential or prospective investors are interested in knowing the dividends which the company distributes per

share. The Dividend Per Share (DPS) is calculated by dividing the profits distributed as dividend by the number of equity share outstanding.

$$\text{D.P.S.} = \frac{\text{Earnings distributed as dividend to equity shareholders}}{\text{No of equity shares outstanding}}$$

Example: If the company (the particulars of which are given in Illustration - 9) is assumed to have distributed Br. 150, 000 as dividends.

$$\text{DPS} = \frac{\text{Br.150000}}{50000} = \text{Br.3/-}$$

7. Dividend Payment Ratio

This is calculated by dividing the DPS by the EPS or by dividing the total dividends paid by total earnings made.

$$\text{Dividend Payment Ratio} = \frac{\text{DPS}}{\text{EPS}}$$

This shows the percentage of profit after taxes and Preference dividend distributed as dividends.

If the DPR ratio is subtracted from 100, it will give the retention ratio, i.e., percentage of profits retained in the business.

8. Dividend Yield

The dividend yield is the DPS divided by the market price per share. This indicates the shareholder's return (dividend) in relation to the market value per share.

$$\text{Dividend yield} = \frac{\text{Dividend per share}}{\text{Market price per share}}$$

9. Earnings yield

The earnings yield is the EPS divided by the market price per share. It is also known as Earnings Price Ratio.

$$\text{Earnings yield} = \frac{\text{Earnings per share}}{\text{Market price per share}}$$

10. Price Earnings ratio

This is reciprocal of earnings yield. This ratio is widely used by security analysts to evaluate the firm's performance and what is expected by the investors.

$$\text{PE Ratio} = \frac{\text{Market value per share}}{\text{EPS}}$$

This indicates the investor's expectations in respect of the firm's performance.

The profitability of a firm can be assessed from the point of view of creditors also. The suppliers of funds, i.e., the creditors are interested in the profits as they constitute the sources from which regular payment of interest and repayment of loan (in a lump sum or in installments) will be made. They measure the profitability for the interest and fixed charges and also debt servicing.

11. Earning Power

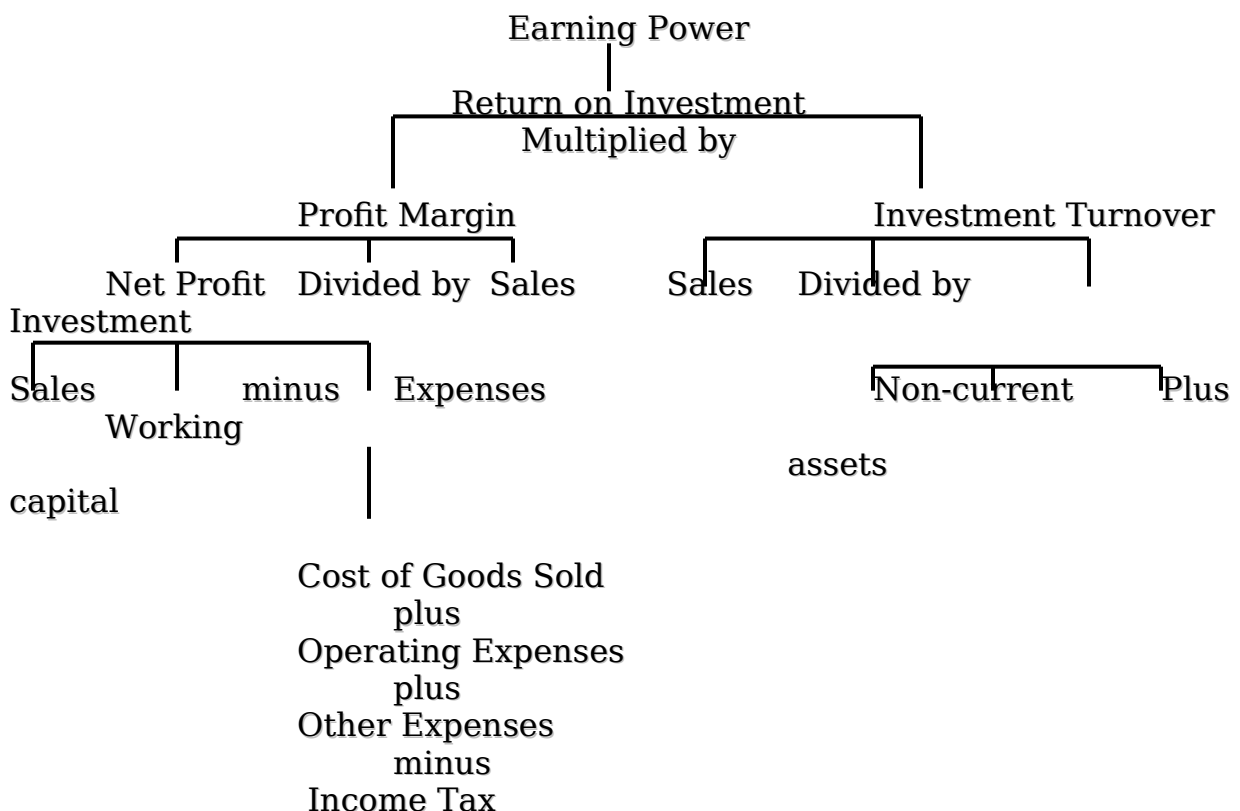
This is an indicator of the overall profitability of the firm. In the earlier paragraphs the measures of (i) profitability from the point of view of owners and (ii) operating efficiency of the firm have been explained. Individually, these two types of ratios do not provide a complete picture of the effectiveness of the firm and its overall profitability. A high profit margin no doubt is an index of better operational performance but a low margin does not necessarily imply a low rate of return on investment if the firm has a higher investment turnover. Therefore, the overall profitability and operating efficiency of the firm can be assessed on the basis of a combination of the two ratios. The combined profitability measures which has a combination of net profit margin and the investment turnover is known as earning power or return on investment ratio (ROI). The earnings power of a firm may be defined as the overall profitability of the concern. This earning power has two elements, viz., net profit margin which is a

measure of profitability on sales and investment turnover which reveals the profitability of investments. Thus the earning power of a firm is the product of net profit margin and the investment turnover. That is,

$$\begin{aligned}\text{Earning Power} &= \text{Return on investment} \\ &= \frac{\text{Net Profit After Tax}}{\text{Sales}} \times \frac{\text{Sales}}{\text{Capital Employed or Total Asset}} \\ &= \frac{\text{Net Profit After Tax}}{\text{Capital Employed or Total Asset}}\end{aligned}$$

Du Point Chart

As stated above, the earning power of a firm is represented by the return on capital employed. It shows the combined effect of the net profit margin and the investment turnover. A change in any of these ratios will affect the firm's earning power. But these two ratios in turn are affected by many factors. Thus the factors affecting the earning power may be presented in the form of a chart. This chart is called 'Du Chart' because it was first used by the Du Point Company of the U.S.A.



Du point chart

Check Your Progress -6

1. How is Gross profit margin calculated?

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2. What is operating ratio?

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3. What do you understand by Earnings Per Share (EPS)?

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4. How is price earnings ratio calculated?

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4.11 SUMMING UP

Ratio analysis is the most useful and widely used tool of financial analysis. A purposeful ratio analysis helps in identifying problems such as whether the financial condition of the firm is sound; whether capital structure of the firm is appropriate; whether profitability of the enterprise satisfactory; whether the credit policy of the firm is sound etc.

However, ratio analysis suffers from certain limitations. Ratios themselves are not of much significance. They become useful only when they are

compared with some standards. Ratio analysis is likely to give misleading result if the effect of changes in price level are not taken into account. Ratio analysis is not meaningful unless the questions sought to be answered are clearly formulated. The nature of the business characteristics which affect the figures in the financial statement and their inter-relationship should be clearly understood and born in mind in order to make a meaningful ratio analysis.

Ratios may be classified on the basis of their importance as primary ratios and secondary ratio; on the basis of sources as balance sheet ratios and income statement ratios; on the basis of nature of items as financial ratios and operating ratios and on the basis of the purpose as solvency ratios, liquidity ratios, activity ratios and profitability ratios.

Several ratios can be calculated from the data contained in the financial statements. Different persons undertake financial statement analysis for different purposes. For instance, short-term creditors show interest mainly in the short-term liquidity position of the firm. Owner's interest lies in the profitability analysis and financial condition of the firm. The management of the firm is interested in evaluating every activity of the firm. Ratio analysis meets the requirements of all the above persons.

The leverage or capital structure ratios help to understand the long term solvency of the firm while liquidity ratios are useful to measure the short-term solvency of the firm. Activity ratios indicate the efficiency with which the firm manages and uses its assets. Hence they are also called as efficiency ratios. Profitability ratios, on the other hand, are useful to measure the profitability of the firm and its operating efficiency.

4.12 ANSWERS TO CHECK YOUR PROGRESS

1. i) Ratios can be classified:
 1. On the basis of importance

2. On the basis of source
 3. on the basis of nature of items
 4. On the basis of purpose or function
- ii) 1. Current ratio (current assets to current liabilities)
2. Debt-equity ratio.
2. i) Debt-equity ratio reveals the relationship between borrowed funds and owners' capital of a firm.
- ii) Debt to total capital = $\frac{\text{LongTermDebt}}{\text{PermanentCapital} + \text{CurrentCapital}}$
3. i) It is useful for knowing the firm's debt servicing capacity.
- ii) Dividend coverage ratio measures the ability of a firm to pay dividend on preference shares.
4. i) a) Current ratio b) Quick ratio
- ii) a) Cash b) Debtors c) Stock
- iii) a) Creditors b) Bills payable c) Bank overdraft
- iv) Current Ratio = $\frac{\text{CurrentAssets}}{\text{CurrentLiabilities}}$
5. Total assets turnover ratio is calculated by dividing the annual sales value by the value of total assets.
6. i) Gross profit margin = $\frac{\text{GrossProfit}}{\text{Sales}}$
- ii) Operating ratio explains the changes in net profit margin.

$$\text{Operating Ratio} = \frac{\text{Cost of goods sold} + \text{Operating Expense}}{\text{Sales}}$$

- iii) Earnings per share reveals the profit available to each ordinary share.

$$\text{EPS} = \frac{\text{Profit After Tax} - \text{Preference Dividend}}{\text{No of equity shares outstanding}}$$

iv) P.E. Ratio = $\frac{\text{Market value per share}}{\text{EPS}}$

4.13 MODEL EXAMINATION QUESTIONS

A. Answer the following questions in about 15 lines.

1. What is a ratio?
2. Explain the meaning of ratio analysis.
3. How is ratio analysis useful?
4. State the important limitations of ratio analysis.
5. What are leverage ratios?
6. What is Acid-Test Ratio?
7. How is Return on investment calculated?
8. Explain the following:
 - a) Net worth b) Operating Ratio
 - c) E.P.S. d) Current ratio
9. What do you understand by debt-equity ratio?
10. How can you classify the ratios on the basis of purpose or function?

4.14 RECOMMENDED BOOKS

- Kuchhal S.C. : Financial management, Chaitany Publishing House Allahabad.
- Pandey IM. : Financial management, Vikas Publishing House Put Ltd.
New Delhi.
- Brigham EF : Fundamentals of Financial Management Dryden Press, Chicago
- Gitman L.J : Principles of Managerial Finance Harper Row, New York.
- Prasanny Chandra: Financial Management Theory and Practice Tata McGraw Hill, New Delhi.

UNIT 5: TIME VALUE OF MONEY

Contents

- 5.0 Aims and Objectives
- 5.1 Introduction
- 5.2 Time Value of Money
- 5.3 Techniques of Present Value Vs Future Value
- 5.4 Problems and Solutions
- 5.5 Summary
- 5.6 Answers to Check Your Progress
- 5.7 Model Examination Questions
- 5.8 Reference

5.0 AIMS AND OBJECTIVES

This unit will discuss the meaning of time value of money, its importance in our day-to-day life.

After reading this unit, you will be able to:

- ☞ explain the meaning of time value of money
- ☞ understand future value and present value
- ☞ calculate the future and present values

5.1 INTRODUCTION

This unit aims at providing basic concepts on the time value of money. This is very important for taking any financial decision. In a business we are investing huge amounts of money today in anticipation of uncertain future returns or revenues. You have already learned that capital is not only scarce but also has cost. Cost in simple terms is nothing but the interest. Suppose you would like to borrow Birr 1, 000 today and return the same after a month without any interest. Do you think some one is going to lend you Birr 1, 000? Definitely no. If you are prepared to pay interest of 3% for

a month on the borrowed money, people will come forward to lend you money. The reason is simple money is not available freely and it is capable of earning interest i.e., Birr 30. It is evident that today's Birr 1, 000 is equivalent to Birr 1, 030 after a month. Here Birr 30 is called cost of capital in financial management.

5.2 TIME VALUE OF MONEY

By experience, we all know that the value of a sum of money received today is more than its value received after some time this is called time value of money. Conversely, the sum of money received in future is less valuable than it is today. The present worth of birr received after some time will be less than a birr received today. Since, a birr received today has more value, individuals, as a rational human beings would naturally prefer current receipt to future receipts.

The time value of money is also known as time preference for money. The time preference for money in business unit normally expressed in terms of rate of return or more popularly as a discount rate. In a business revenues are spread over a period of time i.e., the life of the project. It is nothing but we are trying to calculate the present value versus future value.

5.3 TECHNIQUES OF PRESENT VALUE VS FUTURE VALUE

Compound value: where a sum of money deposited one time and earns interest for a specified period. The interest is paid on principal as well as on an interest earned but not withdrawn during earlier period is called compound interest.

$FV = PV + (\text{interest} \times \text{principal})$ For example you deposit

Birr 100 @10% interest

After one year = $100 + (100 \times .10)$

= 110

After two years = $110 + (110 \times .10)$

$$= 121$$

$$\text{After three years} = 121 + (121 \times .10)$$

$$= 133.10$$

$$FV_1 = P(1+i)$$

$$FV_2 = P(1+i)^2 \quad FV_2 = FV_1 + F_1i \quad P(1+i)^2$$

$$FV_3 = P(1+i)^3 \quad FV_2 = F_1(1+i)P$$

$$FV_2 = P$$

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

Here the term $(1+i)^n$ is the compounded value factor (CVF) of a lump sum of birr 1. The values may be directly traced from the present value tables. You have already learned the calculation of present value factors in financial accounting II. Hence, you can directly apply the present value factors and find out the values.

The same may be written as below:

$$FV = P(CVF_n \cdot i)$$

FV = Future value

P = Present value

CVF_n = Compounded value factor year

i = rate of interest

Suppose you deposit Br. 55, 650 in a bank which will pay you 12 percent interest for a period of 10 years. How much would the deposit grow at the end of ten year?

$$FV = P(CVF_n \cdot i)$$

$$FV = 55,650 (CVF_{10} \cdot .12)$$

$$FV = 55,650 (3 \cdot 106)$$

$$= 172,849.90$$

Compound value of Annuity: An annuity is a fixed payment (or receipt) each year for a specified number of years. Assume that a sum of birr 1 is deposited at the end of each year for four years at 6% interest. This implies that

$1(1+.06)^3$ 1.191 Birr 1 deposited at the end of year 1 grow for 3 years.

$1(1+.06)^2$ 1.124 Birr 1 deposited at the end of year 2 grow for 2 years.

$1(1+.06)^1$ 1.06 Birr 1 deposited at the end of year 3 grow for 1 year.

1 Birr 1 deposited at the end of year 4 grow for no interest.

4.375

$$FV_4 = A(1+i)^3 + A(1+i)^2 + A(1+i) + A$$

$$FV_4 = A[(1+i)^3 + (1+i)^2 + (1+i) + 1]$$

$$FV_n = A \left[\frac{(1+i)^n - 1}{i} \right]$$

The same may be written as below

$$FV = A(CVAF_n i)$$

FV = Future value

A = Annuity

CVAF_n = Compounded Value Annuity Factor to year

i = rate of interest

Assume that you deposit a sum of birr 5, 000 at the end of each year for four years at 6% interest. How much would this annuity accumulate at the end of fourth year.

$$\begin{aligned} FV &= A(CVAF_n i) \\ &= 5,000 (CVAF_4 .06) \\ &= 5,000 (4.375) \\ &= 21,875 \end{aligned}$$

Sinking Fund: This is going to be in reverse to the compounded value annuity factor. Here we proceed that to create certain sum of money, how much we have to set aside every year for a specified period.

$$FV = A(CVAF_{n,i})$$

$$A = FV \left[\frac{1}{CVAF_{n,i}} \right]$$

$$A = FV (SFF_{n,i}) \quad SFF = \text{Sinking Fund Factor}$$

$$A = F \left[\frac{i}{(1+i)^n} - 1 \right]$$

For instant to clear off a loan of birr 21, 875 after four years, how much we have to set aside?

$$FV = A(CVAF_{n,i})$$

$$\begin{aligned} A &= FV \left[\frac{1}{CVAF_{n,i}} \right] \\ &= 21,875 \text{ FV} \left[\frac{1}{4.375} \right] \\ &= 21,875 \times .2286 \\ &= 5,000 \end{aligned}$$

Present Value: here, we calculate the present value of future earnings at a particular rate of interest. This may be further classified into two

- I) Present value of a lump sum. The present sum of money to be invested today in order to get birr 1 at the end of year 1, 2, 3 so on and so forth at the rate of 10% interest.

We know $F_1 = P(1+i)$ at the end of year 1.

$$1 = P(1+10\%)$$

$$P = \frac{1}{(1+i)}$$

$$= \frac{1}{(1+.10)}$$

$$= \frac{1}{1.10}$$

$$= 0.909$$

$$F_2 = P(1+i)^2$$

$$1 = P(1+.10)^2$$

$$P = \frac{1}{(1+.10)^2}$$

$$= \frac{1}{1.21}$$

$$= 0.826$$

$$F_3 = P(1+i)^3$$

$$1 = P(1+.10)^3$$

$$P = \frac{1}{(1+.10)^3}$$

$$= \frac{1}{1.331}$$

$$= 0.751$$

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

$$P = \frac{F_n}{(1+i)^n}$$

$$= \left[\frac{F_n}{(1+i)^n} \right]$$

$$= F_n [(1+i)^{-n}]$$

You wanted to know the present value of birr 50, 000 to be received after 15 years at the rate of interest 9%

$$PV = FV (PVF_n i)$$

$$= 50,000 (PVF_{15} .09)$$

$$= 50,000 (.275) \text{ present value table}$$

$$= 13,750$$

Present value of Annuity: An investor some times may receive constant amount for a certain number of years. We may have to calculate the present value of such annuity to be received each year for a specific period.

$$\begin{aligned}
P &= \frac{A}{(1+i)} + \frac{A}{(1+i)^2} + \frac{A}{(1+i)^3} + \frac{An}{(1+i)^n} \\
&= A \left[\frac{1}{(1+i)} + \frac{1}{(1+i)^2} + \frac{1}{(1+i)^3} + \frac{1n}{(1+i)^n} \right] \\
P &= A \left[\frac{1 - \frac{1}{(1+i)^n}}{i} \right] \\
P &= A \left[\frac{(1+i)^n - 1}{i(1+i)^n} \right]
\end{aligned}$$

A company receives an annuity of birr 5, 000 for four year at the interest of 10 percent. Then the present value would be

$$\begin{aligned}
P &= A \left[\frac{1 - \frac{1}{(1+i)^n}}{i} \right] \\
P &= 5,000 \left[\frac{1 - \frac{1}{(1.10)^4}}{.10} \right] \text{ Simply, you can refer to the PV tables}
\end{aligned}$$

for PV factor.

$$\begin{aligned}
&= 5,000 \times 3.170 \\
&= 15,850 \\
PV &= A(PVAF_n, i) \\
&= 5,000(3.170) \text{ from PV table or using the above formulae} \\
&= 15,850
\end{aligned}$$

Capital Recovery: The reciprocal of the present value annuity factor is called capital recovery factor (CRF). It will give the annuity to repay certain amount of borrowed loan at a particular interest for a specified period.

$$\begin{aligned}
PV &= A(PVAF_n, i) \\
A &= PV \left[\frac{1}{PVAF_n} \right] \\
A &= PV (CRF_n, i) \text{ CRF} = \text{Capital Recovery Factor} \\
A &= P \left[\frac{i(1+i)^n}{(1+i)^n - 1} \right]
\end{aligned}$$

A company borrows Birr 1, 000, 000 at an interest rate of 15 percent and the loan is to be repaid in 5 equal installments payable at the end of each of the next 5 years. Prepare loan amortization table and the annual installment.

$$\begin{aligned}
 PV &= A (PVAF_n .i) \\
 1,000,000 &= A (PVAF_5 .15) \\
 1,000,000 &= A (3.3522) \\
 \frac{1,000,000}{3.3522} &= A \\
 298,311 &= A
 \end{aligned}$$

Loan Amortization Table

Year	Ope. Bala. Closi. Balance	Annu. Install.	Interest	Principal
	Birr	Birr	Birr	Birr
	Birr			
1	1,000,000	298,312	150,000	148,312
	851,688			
2	851,688	298,312	127,753	170,559
	681,129			
3	681,129	298,312	102,169	196,143
	484,986			
4	484,986	298,312	72,748	225,564
	259,422			
5	259,422	298,312	38,913	259,399
	23			

- Birr 23 left because annuity is taken as 298, 312 instead of 298, 311.

Multi period Compounding: Till now, we have seen the cash flows will occur once in a year. But, the cash flows may occur monthly, bi-monthly, quarterly, half yearly and yearly. In such instances we have to apply the following formulae.

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

You have deposited a birr of 1, 000 in Commercial Bank of Ethiopia at 12 percent interest per annum. It compound annually, semi-annually, quarterly and monthly for two years. How much does it grow?

1) Annual compounding

$$n = 2 \quad i = .12\%$$

$$\begin{aligned} FV &= P(CVF_n .i) \\ &= 1, 000 (CVF_2 .12) \\ &= 1, 000 (1.254) \\ &= 1, 254 \end{aligned}$$

2) Half-yearly $n = 2 \times 2 = 4$ $i = \frac{12}{2} = 6\%$

$$\begin{aligned} FV &= 1, 000 (CVF_4 .06) \\ &= 1, 000(1.262) \\ &= 1, 262 \end{aligned}$$

3) Quarters $n = 4 \times 2 = 8$ $i = \frac{12}{4} = 3\%$

$$\begin{aligned} FV &= 1, 000 (CVF_{12} .03) \\ &= 1, 000 (1.267) \\ &= 1, 267 \end{aligned}$$

4) Monthly $n = 12 \times 2 = 24, i = \frac{12}{12} = 1\%$

$$\begin{aligned} FV &= 1, 000 (CVF_{24} .01) \\ &= 1, 000 (1.270) \\ &= 1, 270 \end{aligned}$$

Check Your Progress -1

1. If you invest Birr 5, 000 today at a compound interest of 9 percent, what will be its future value after 15 years?

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.....
.....

2. You want to take a world tour which costs Birr 1, 000, 000, the cost is expected to remain unchanged in normal terms. You can save Birr 80, 000 annually to fulfill your desire. How long will you have to wait of your savings earn a return of 14 percent annum?

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5.4 PROBLEMS AND SOLUTIONS

Future Value

Compound value of Lump sum

Future Value = Present value + (Rate of interest) (Present value)

1. You deposit Br. 100 in a bank at 10% interest what would be amount after 3 years.

$$\begin{aligned} \text{FV} &= \text{PV} + (\text{PV}) (\text{Rate of interest}) \\ &= 100 + 100 (.10) \\ &= 100 + 10 \\ &= \underline{110} \\ &= 110 + (110) (.10) \\ &= 110 + 11 \\ &= \underline{121} \end{aligned}$$

$$\begin{aligned}
 &= 121 + (121) (.10) \\
 &= 121 + 12.10 \\
 &= \underline{133.10}
 \end{aligned}$$

Suppose Br. 1,000 are placed in SBA/C of a Bank at 5% interest what will be the future value after 5 years.

Compound value factor - Table -A

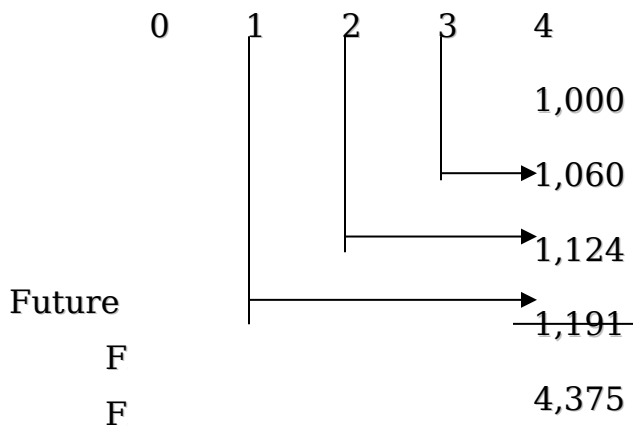
$$\begin{aligned}
 FV &= PV (CVF_5 .5) \\
 &= 1,000 (1.266) \\
 &= \underline{1,276}
 \end{aligned}$$

2. If you deposit Br. 55,650 in a Bank at 12% interest for a period of ten years what will be the future value?

$$\begin{aligned}
 FV &= 55,650 (CVF_{10} .12) \\
 &= 55,650 (3.106) \\
 &= \underline{172, 848.90}
 \end{aligned}$$

Compound Value of Annuity

Suppose Br. 1,000 is invested in annuity for four years at the rate of 6%



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

$$Fv = A (CVAF_n I)$$

(Compound value factor for annuity factor)

3. You deposit a sum of Br. 5,000 at the end of each year for four years at 6%. How much would this annuity accumulate at the end of the fourth year?

$$\begin{aligned} FV &= A (CVAF_4, .06) \\ &= 5,000(4.375) \\ &= \underline{21,875} \end{aligned}$$

4. Your father has promised to give you 100,000k, in cash on your 25th birthday. Today is your 16th birthday. He wants to know two things

- a) He decides to make annual payments into a fund after one year, how much will each have to be if the fund pays 8%.
- b) If he decides to invest a lump sum in the account after one year and let it compound annually. How much will the lump sum?

$$\begin{aligned} A) \quad FV &= A (CVAF_n .I) \\ 100,000 &= A(12.488) \\ \frac{100000}{12.488} &= A \\ \underline{8,007.69} &= A \end{aligned}$$

$$\begin{aligned} B) \quad FV &= PV (CVF_n .2) \\ 100,000 &= PV (CVF_9, .08) \\ 100,000 &= PV (1.999) \\ \frac{100000}{1.999} &= PV \\ \underline{50,025} &= P \end{aligned}$$

5. CBE pays 12% interest and compounds quarterly. If Br. 1,000 are deposited initially, how much shall it grow at the end of 5 years?

The quarterly interest will be 3%, number period will be 20

$$\begin{aligned} FV &= PV \left(1 + \frac{.12}{4}\right)^{nxm} \\ &= 1,000 (1.03)^{20} \\ &= 1,000 \times 1.806 \end{aligned}$$

$$= \underline{1,806}$$

6. How long will it take to double your money if it grows at 12% annually?

$$FV = PV (CVF_n .12)$$

$$Br. 2 = Br. 1 (CVF_n .12)$$

$$\text{From Table } Br. 2 = CVF_n .12 = 1.974 \text{ Therefore } n = 6$$

7. Mohan bought a share 15 years ago for Br. 10. It is now selling Br. 27.60. What is the compound growth rate the price of share

$$FV = PV (CVF_n .r)$$

$$27.60 = 10 (CVF_{15} .r)$$

$$\frac{27.60}{10} = CVF_{15} .r)$$

$$\text{From Table } 2.760 = 7\%$$

8. X is borrowing Br. 50,000 to buy a house. If he pays equal installments 25 years and 4% interest on outstanding balances, what is the amount of installment?

$$FV = A(CVAF_n .r)$$

$$50,000 = A (CVAF_{25} .04)$$

$$50,000 = A(15.622)$$

$$\frac{50000}{15.622} = A$$

$$\underline{3,200.61} = A$$

If it is quarterly payment

$$FV = A(CVAF_{100} .01)$$

$$50,000 = A (63.029)$$

$$\frac{50000}{63.029} = A \qquad \underline{793.28} = A$$

9. A company issued 5,000,000 bonds to be repaid after 7 years. How much should it invest in sinking fund earning 12%, in order to repay bonds.

$$\begin{aligned}
FV &= A (CFA_n .r) \\
5,000,000 &= A (CFA_7 .12) \\
5,000,000 &= A (10.089) \\
\frac{5,000,000}{10.089} &= A \\
\mathbf{495,589} &= A
\end{aligned}$$

10. X will receive first payment of pension at the end of 10th year from now a Br. of 3,000 a year. The payment will continue for 16 years. How much is the pension worth now, If X's interest rate is 10%?

Table A-4

$$\begin{aligned}
&25 \text{ years} - 9.077 \\
&\quad - 9 \quad - 5.759 \\
&\hline
&16 \text{ years} - 3.318 \\
FV &= A (CFA_n .r) \\
&= 3,000 (3.318) \\
&= \mathbf{9.954}
\end{aligned}$$

11. A company has to retire Br. 500, 000 debentures of 8% interest 10 years from today. The company plans to put a fixed amount into a sinking fund each year for 10 years. A separate fund is created for the purpose. The first payment will be paid at the end of the current year. The company anticipates that the fund will earn 6% a year. What should be the installments to accumulate 500,000 from now?

Table A-2

$$\begin{aligned}
FV &= A (CAF_{10} .06) \\
500,000 &= A(CAF_{10} .06 \text{ i.e. } 13.181) \\
\frac{500,000}{13.181} &= A \\
\mathbf{37,933.388} &= \mathbf{A}
\end{aligned}$$

12. A limited company borrows from commercial bank Br. 1,000,000 at 12% interest to be paid in equal annual installments.

What would be the size of the installment be? Assume the repayment period is 5 years.

$$FV = A (CAF_5 .12)$$

$$1,000,000 = A (3.605)$$

$$\frac{1,000,000}{3.605} = A$$

$$277,392.51 = \underline{A}$$

13. A sum of Br. 50,000 deposited in a fund which will earn 12% compound semiannually for the first 5 years and 8% interest compounded quarterly for the next 7 years. How much will be amount after 12 years.

$$\text{First 5 years } n = 5 \times 2 = 10 \text{ Interest } \frac{12}{2} = 6\%$$

$$\text{Second 7 years } n = 7 \times 4 = 28 \text{ interest } \frac{8}{4} = 2\%$$

$$FV = 50,000 (CVF_{10} .06)$$

$$= 50,000 (1.791)$$

$$= \underline{89,542}$$

$$FV = 89,542 (CVF_{14} .02)$$

$$= 89,542 (1.741)$$

$$= \underline{155,895}$$

If A wanted to deposit cash in a saving account at the beginning of year 1, so that he will have Br. 45,000 at the end of 9 years. What is the money to be deposited by A at the beginning of the year 1, if the interest rate for the first five years is 10% compounded semi-annually and the interest rate for the last four years is 12% compounded quarterly?

$$\underline{\text{Last 4\%}} \quad FV = PV = (CVF_n .I) \frac{12}{4} = 3\%$$

$$45,000 = PV (CVF_n 16 .3)$$

$$45,000 = PV (1.605)$$

$$\frac{45,000}{1.605} = PV$$

$$28,037 = \underline{\underline{PV}}$$

First 5 year

$$n = 10 \qquad \text{interest} = \frac{10}{2} = 5\%$$

$$\begin{aligned} FV &= PV (CVF_n, i) \\ &= PV (CVF_{10} .05) \end{aligned}$$

$$28,037 = PV (1.629)$$

$$\frac{28037}{1.629} = PV$$

$$17,211 = \underline{\underline{PV}}$$

5.5 SUMMARY

In our day-to-day life we prefer possession of a given amount of cash now, rather than the same amount at future time. This is time value of money or time preference for money, which arises because of (a) uncertainty of cash flows (b) subjective preference for consumption and (c) availability of investments. The last justification is the most sensible justification for the time value of money.

Interest rate or time preference rate gives money its value and facilitates the comparison of cash flows accounting at different time periods. Two alternative procedures can be used to find the value of cash flows: compounding and discounting. In compounding, future values of cash flows at a given interest rate at the end of a given period of time are found. The future value (F) of a lump sum today (p) for 'n' period at 'i' rate of interest is given by the following formula:

$$\begin{aligned} F_n &= P(1+i)^n \\ &= P(CVF_n, i) \end{aligned}$$

The Compound Value Factor (CVFn i) can be found out from the tables.

The future value for annuity for 'n' periods at 'i' interest may be calculated by the following formula.

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

$$= P (CVAFn .i)$$

Compounded Value Annuity Factors (CVAFn .i) is also found from the tables

5.6 ANSWERS TO CHECK YOUR PROGRESS

1. Since the table value for 75 years is not available we can take

$$FV = P(CVF_n i)$$

$$= P (CVF_{30} .0.a) (CVF_{30} .0.a) (CVF_{15} .09)$$

$$= 5,000(13.268) (13.268) (3.642)$$

$$= 3,205,685.1$$

2. $FV = A (CVAFn .i)$

$$1,000,000 = 80,000 (CVAFn .14)$$

$$\frac{1,000,000}{80,000} = CVAFn .14$$

$$12.5$$

Look into the table for equal or nearest value you will find between 7 and 8 years = 7.72

or

$$1,000,000 = 80,000 (CVAFn .14)$$

$$= 80,000 \left[\frac{1.14^n - 1}{.14} \right]$$

$$\frac{1,000,000}{80,000} \times 0.14 = 1.14^n - 1$$

$$1.75 + 1 = 2.75 = 1.14^n$$

$$\log 2.75 = n \log 1.14$$

$$0.4393 = n \times .0569$$

$$\frac{.4393}{.0569} = n$$

$$7.72 = \text{years}$$

5.7 MODEL EXAMINATION QUESTIONS

1. What is meant by time value of money?
2. Explain the significance of present and future values in a business organization.

5.8 REFERENCES

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