CHAPTER ONE

1.1 OVERWIEW OF FINANCIAL MANAGEMENT

Business concern needs finance to meet their requirements in the economic world. Any kind of business activity depends on the finance. Hence, it is called as **lifeblood of business organization**. Whether the business concerns are big or small, they need finance to fulfill their business activities.

In the modern world, all the activities are concerned with the economic activities and very particular to earning profit through any venture or activities. The entire business activities are directly related with making profit. Increasing the profit is the main aim of any kind of economic activity.

DEFINITION OF FINANCE

The concept of finance includes capital, funds, money, and amount. But each word is having unique meaning. Studying and understanding the concept of finance become an important part of the business concern. Different scholars define finance in the following ways:

- "Finance is the art and science of managing money".
- 'Finance' connotes 'management of money'.
- finance as "the Science on study of the management of funds' and the management of fund as the system that includes the:
  - Circulation of money,
  - granting of credit,
  - making of investments, and
  - Provision of banking facilities.

FINANCE AS AN AREA OF STUDY

Finance is the study of how investors allocate their assets over time under conditions of certainty and uncertainty. Finance is the application of economic principles and concepts to business decision making and problem solving. The field of finance broadly consists of three categories: Financial Management, Investments and Financial Institutions.

I. **Financial Management:** This area is concerned with financial decision making within a business entity. Financial Management is concerned with planning, directing, monitoring, organizing and controlling monetary resources of an organization. Financial Management simply deals with management of money matters. Financial management decisions include maintaining optimum cash balance, extending credit, mergers and acquisitions, raising of funds and the instruments to be used for raising funds and the instruments to be used for raising funds etc.

II. **Investments:** This area of finance focuses on the behavior of financial markets and pricing of financial instruments. It is a study of security analysis, portfolio theory, market analysis, and behavioral finance. The three main

functions in the investments area are sales, analyzing individual securities, and determining the optimal mix of securities for a given investor.

III. **Financial Institutions:** This area of finance deals with banks and other financial institutions that specialize in bringing supplier of funds together with the users of funds. There are three categories of financial institutions which act as an intermediary between savers and users of funds, viz., banks, developmental financial institution and capital markets.

Financial management is broadly concerned with the acquisition and use of funds by a business firm. The scope of financial management has grown in recent years, but traditionally it is concerned with the following:

- How large should a firm be and how fast should it grow?
- What should be the composition of the firm's assets?
- What should be the mix of the firm's financing?
- How should the firm analyze, plan and control its financial affairs?

1.2 EVOLUTION OF FINANCIAL MANAGEMENT

The evolution of financial management may be divided into three broad phases:

1. The traditional phase
2. The transitional phase
3. The modern phase.

The traditional phase: the focus of financial management was on certain events which required funds e.g., major expansion, merger, reorganization etc. The traditional phase was also characterized by heavy emphasis on legal and procedural aspects as at that point of time the functioning of companies was regulated by a plethora of legislation. Another striking characteristic of the traditional phase was that, a financial management was designed and practiced from the outsider's point of view mainly those of investment bankers, lenders, regulatory agencies and other outside interests.

The transitional phase: the nature of financial management was the same but more emphasis was laid on problems faced by finance managers in the areas of fund analysis planning and control.

The modern phase: is characterized by the application of economic theories and the application of quantitative methods of analysis. The distinctive features of the modern phase are:

- Changes in macro economic situation that has broadened the scope of financial management. The core focus is how on the rational matching of funds to their uses in the light of the decision criteria.
- The advances in mathematics and statistics have been applied to financial management especially in the areas of financial modeling, demand forecasting and risk analysis.

1.3 IMPORTANCE OF FINANCIAL MANAGEMENT

Finance is the lifeblood of business organization. It needs to meet the requirement of the business concern. Each and every business concern must maintain adequate amount of finance for their smooth running of the business concern and also maintain the business carefully to achieve the goal of the business concern. The business goal can be achieved only with the help of effective management of finance. We can't neglect the importance of finance at any time at and at any situation. Some of the importance of the financial management is as follows:

Financial Planning
Financial management helps to determine the financial requirement of the business concern and leads to take financial planning of the concern. Financial planning is an important part of the business concern, which helps to promotion of an enterprise.

Acquisition of Funds
Financial management involves the acquisition of required finance to the business concern. Acquiring needed funds play a major part of the financial management, which involve possible source of finance at minimum cost.

Proper Use of Funds
Proper use and allocation of funds leads to improve the operational efficiency of the business concern. When the finance manager uses the funds properly, they can reduce the cost of capital and increase the value of the firm.

Financial Decision
Financial management helps to take sound financial decision in the business concern. Financial decision will affect the entire business operation of the concern. Because there is a direct relationship with various department functions such as marketing, production personnel, etc.

Improve Profitability
Profitability of the concern purely depends on the effectiveness and proper utilization of funds by the business concern. Financial management helps to improve the profitability position of the concern with the help of strong financial control devices such as budgetary control, ratio analysis and cost volume profit analysis.

Increase the Value of the Firm
Financial management is very important in the field of increasing the wealth of the investors and the business concern. Ultimate aim of any business concern will achieve the maximum profit and higher profitability leads to maximize the wealth of the investors as well as the nation.

Promoting Savings
Savings are possible only when the business concern earns higher profitability and maximizing wealth. Effective financial management helps to promoting and mobilizing individual and corporate savings.

Determination of Business Success: Sound financial management leads to optimum utilization of resources which is the key factor for successful enterprises. If we analyze the factors which lead to an enterprise turning sick one of the main factors would be mismanagement of financial resources. Financial Management helps in preparation of plans for growth, development, diversification and expansion and their successful execution.

Focal Point of Decision Making: Financial management is the focal point of decision-making as it provides various tools and techniques for scientific financial analysis. Some of the techniques of financial management are comparative financial statement, budgets, ratio analysis, variance analysis, cost- volume, profit analysis, etc. These tools help in evaluating the profitability of the project.

Measurement of Performance: The performance of the firm is measured by its financial results.
The value of the firm is determined by the quantum of earnings and the associated risk with these earnings. Financial decisions which increases earnings and reduce risk will enhance the value of the firm.
Basis of Planning, Co-ordination and Control: Each and every activity of the firm requires resource outlays which are ultimately measured in monetary terms. The finance department being the nodal department is closely associated with the planning of most of the activities of the various departments. Since most of the activities of the firm require co-ordination among various departments, the finance department facilitates this co-ordination by supplying the requisite information. Since the results of various activities are measured in monetary terms, again the finance department is closely involved in control and monitoring activities.

Advisory Role: The finance manager plays an important role in the success of any organizations.
Information Generator for Various Stakeholders: In this modern era where business managers are trustees of public money, it is expected that the firm provides information to the various stakeholders about the functioning of the firm. One of the major objectives of financial management is to provide timely information to various stakeholders.

1.4 FUNCTIONS OF FINANCIAL MANAGEMENT

The broad principles of corporate finance are:

1. Investment Decision
2. Financing Decision
3. Dividend Decision
4. Liquidity Decision

Investment Decision

The firm has scarce resources that must be allocated among competing uses. On the one hand the funds may be used to create additional capacity which in turn generates additional revenue and profits and on the other hand some investments results in lower costs. In financial management the returns, from a proposed investment are compared to a minimum acceptable hurdle rate in order to accept or reject a project. The hurdle rate is the minimum rate of return below which no investment proposal would be accepted. In financial management we measure (estimate) the return on a proposed investment and compare it to minimum acceptable hurdle rate in order to decide whether or not the project is acceptable. The hurdle rate is a function of riskiness of the project, riskier the project higher the hurdle rate. There is a broad argument that the correct hurdle rate is the opportunity cost of capital. The opportunity cost of capital is the rate of return that an investor could earn by investing in financial assets of equivalent risk.

Financing Decision

Another important area where financial management plays an important role is in deciding when, where, from and how to acquire funds to meet the firm's investment needs. These aspects of financial management have acquired greater importance in recent times due to the multiple avenues from which funds can be raised. The core issue in financing decision is to maintain the optimum capital structure of the firm that is in other words, to have a right mix of debt and equity in the firm's capital structure. In case of pure equity firm (Zero debt firms) the shareholders returns should be equal to the firm's returns. The use of debt affects the risk and return of shareholders. In case, cost of debt is used the firm's rate of return the shareholder's return is going to increase and vice versa. The change in shareholders return caused by change in profit due to use of debt is called the financial leverage.

Dividend Decision

A dividend decision is the third major financial decision. The share price of a firm is a function of the cash flows associated with the share. The share price at a given point of time is the present value of future cash flows associated with the holding of share. These cash flows are dividends. The finance manager has to decide what proportion of profits has to be distributed to the shareholders. The proportion of profits distributed as dividends is called the dividend payout ratio and the retained proportion of profits is known as retention ratio. The dividend policy must be designed in a way, that it maximizes the market value of the firm's share. The retention ratio depends upon a host of factors− the main factor being the existence of investment opportunities. The investors would be indifferent to dividends if the firm is able to earn a rate or return which is higher than the cost of the capital. Dividends are generally paid in cash, but a firm may also issue bonus shares. Bonus share are shares issued to the existing shareholders without any charge. As far as dividend decisions are

concerned the finance manager has to decide on the question of dividend stability, bonus shares, retention ratio and cash dividend.

Liquidity Decision

A firm must be able to fulfill its financial commitments at all points of time. In order to ensure this the firm should maintain sufficient amount of liquid assets. Liquidity decisions are concerned with satisfying both long and short-term financial commitments. The finance manager should try to synchronize the cash inflows with cash outflows. An investment in current assets affects the firm's profitability and liquidity. A conflict exists between profitability and liquidity while managing current assets. In case, the firm has insufficient current assets it may default on its financial obligations. On the other hand excess funds result in foregoing of alternative investment opportunities.

1.5 SCOPE OF FINANCIAL MANAGEMENT

Financial management is one of the important parts of overall management, which is directly related with various functional departments like personnel, marketing and production.

Financial management covers wide area with multidimensional approaches. The following are the important scope of financial management.

Financial Management and Economics

Economic concepts like micro and macroeconomics are directly applied with the financial management approaches. Investment decisions, micro and macro environmental factors are closely associated with the functions of financial manager.

Financial management also uses the economic equations like money value discount factor, economic order quantity etc. Financial economics is one of the emerging area, which provides immense opportunities to finance, and economical areas.

Financial Management and Accounting

Accounting records includes the financial information of the business concern.

Hence, we can easily understand the relationship between the financial management and accounting. In the olden periods, both financial management and accounting are treated as a same discipline and then it has been merged as Management Accounting because this part is very much helpful to finance manager to take decisions. But nowadays financial management and accounting discipline are separate and interrelated.

Financial Management or Mathematics

Modern approaches of the financial management applied large number of mathematical and statistical tools and techniques. They are also called as econometrics. Economic order quantity, discount factor, time value of money, present value of money, cost of capital, capital structure theories, dividend theories, ratio analysis and working capital analysis are used as mathematical and statistical tools and techniques in the field of financial management.

Financial Management and Production Management

Production management is the operational part of the business concern, which helps to multiply the money into profit. Profit of the concern depends upon the production performance. Production performance needs finance, because production department requires raw material, machinery, wages, operating expenses etc. These expenditures are decided and estimated by the financial department and the finance manager allocates the appropriate finance to production department.

The financial manager must be aware of the operational process and finance required for each process of production activities.

Financial Management and Marketing

Produced goods are sold in the market with innovative and modern approaches. For this, the marketing department needs finance to meet their requirements.

The financial manager or finance department is responsible to allocate the adequate finance to the marketing department. Hence, marketing and financial management are interrelated and depends on each other.

Financial Management and Human Resource

Financial management is also related with human resource department, which provides manpower to all the functional areas of the management. Financial manager should carefully evaluate the requirement of manpower to each department and allocate the finance to the human resource department as wages, salary, remuneration, commission, bonus, pension and other monetary benefits to the human resource department. Hence, financial management is directly related with human resource management.

1.6 OBJECTIVES OF FINANCIAL MANAGEMENT

Effective procurement and efficient use of finance lead to proper utilization of the finance by the business concern. It is the essential part of the financial manager. Hence, the financial manager must determine the basic objectives of the financial management. Objectives of Financial Management may be broadly divided into two parts such as:

1. Profit maximization
2. Wealth maximization

Profit Maximization

Main aim of any kind of economic activity is earning profit. A business concern is also functioning mainly for the purpose of earning profit. Profit is the measuring techniques to understand the business efficiency of the concern. Profit maximization is also the traditional and narrow approach, which aims at, maximizes the profit of the concern. Profit maximization consists of the following important features.

1. Profit maximization is also called as cashing per share maximization. It leads to maximize the business operation for profit maximization.
2. Ultimate aim of the business concern is earning profit; hence, it considers all the possible ways to increase the profitability of the concern.
3. Profit is the parameter of measuring the efficiency of the business concern. So it shows the entire position of the business concern.
4. Profit maximization objectives help to reduce the risk of the business.

Favorable Arguments for Profit Maximization

The following important points are in support of the profit maximization objectives of the business concern:

i) Main aim is earning profit.
ii) Profit is the parameter of the business operation.
iii) Profit reduces risk of the business concern.
iv) Profit is the main source of finance.
v) Profitability meets the social needs also.

Unfavorable Arguments for Profit Maximization

The following important points are against the objectives of profit maximization:

i) Profit maximization leads to exploiting workers and consumers.
ii) Profit maximization creates immoral practices such as corruption, unfair trade practice, etc.
iii) Profit maximization objectives leads to inequalities among the stakeholders such as customers, suppliers, public shareholders, etc.

Drawbacks of Profit Maximization

Profit maximization objective consists of certain drawback also:

i) **It is vague**: In this objective, profit is not defined precisely or correctly. It creates some unnecessary opinion regarding earning habits of the business concern.
ii) **It ignores the time value of money:** Profit maximization does not consider the time value of money or the net present value of the cash inflow. It leads certain differences between the actual cash inflow and net present cash flow during a particular period.
iii) **It ignores risk:** Profit maximization does not consider risk of the business concern. Risks may be internal or external which will affect the overall operation of the business concern.

Wealth Maximization

Wealth maximization is one of the modern approaches, which involves latest innovations and improvements in the field of the business concern. The term wealth means shareholder wealth or the wealth of the persons those who are involved in the business concern.

Wealth maximization is also known as value maximization or net present worth maximization. This objective is a universally accepted concept in the field of business.

Favorable Arguments for Wealth Maximization

i) Wealth maximization is superior to the profit maximization because the main aim of the business concern under this concept is to improve the value or wealth of the shareholders.
ii) Wealth maximization considers the comparison of the value to cost associated with the business concern. Total value detected from the total cost incurred for the business operation. It provides extract value of the business concern.
iii) Wealth maximization considers both time and risk of the business concern.
iv) Wealth maximization provides efficient allocation of resources.
v) It ensures the economic interest of the society.

Unfavorable Arguments for Wealth Maximization

i) Wealth maximization leads to prescriptive idea of the business concern but it may not be suitable to present day business activities.
ii) Wealth maximization is nothing, it is also profit maximization, it is the indirect name of the profit maximization.
iii) Wealth maximization creates ownership-management controversy.
iv) Management alone enjoys certain benefits.
v) The ultimate aim of the wealth maximization objectives is to maximize the profit.
vi) Wealth maximization can be activated only with the help of the profitable position of the business concern.

1.7 AGENCY RELATIONSHIP

With increased geographical spread and other complexities often it is not possible for owners to look after all the aspects of the business. The decision making power is delegated to the managers (agents). An agent is a person who acts for, and exerts power on behalf of another person or group of persons. The person (or group of persons) whom the agent represents is referred to as the **principal**. The relationship between the agent and the principal is an **agency relationship**. There is an agency relationship between the managers and shareholders of a company.

Problems Related with Agency Relationship

In an agency relationship the agent is charged with the responsibility of acting for the principal and in the best interest of the principal. But, it is possible that the agent may act in a fashion which serves his/her own self-interest rather than that of the principal. In recent years we have witnessed numerous corporate frauds i.e. Enron, Xerox, etc., where the agents had misappropriated the authority vested in them by the principal. The problems associated with

agency relationship can manifest it in many ways. The most common being the misuse of power and authority by the managers, which includes financial misappropriation, using the funds of the company for the personal self (fringe benefits) etc. In case the reward and compensations are based on certain parameters, for **example** sales; managers may indulge in practices which would yield result in the short run but prove detrimental in the long run, i.e., overstocking the various intermediaries in the supply chain, offering huge discounts, dumping of goods in the territory of another manager etc. Another facet of this problem is where managers put a little effort towards expanding and exploring the market for new business.

Costs of the Agency Relationship

In order to minimize the potential for conflict between the principal's interest and the agent's interest certain costs are to be incurred by the principal as well as the agent and the cumulative effect of these costs is referred to as the agency costs. Agency costs are of three types: monitoring costs, bonding costs and residual cost.

Monitoring Costs

These are the costs incurred by the principal to monitor and limit the actions of the agent. In companies the shareholders may require the managers to periodically report on their activities via audited financial statements. The cost of resources spent on preparing these statements is monitoring cost. Another example is the implicit cost incurred when the principal limits the decision making power of the agent; by doing so, the principal may miss profitable investment opportunities. The foregone profit is the monitoring cost.

Bonding Costs

These are the costs incurred by the agents to assure the principal that they will act in the best interest of the principal.

Residual Costs

Residual costs are the remaining costs after taking into consideration of the above

These changes coupled with changing customer needs, technology driven innovations and regulatory changes are imposing substantial changes in the financial systems world over. The impacts of these changes are as follows:

1. Increased competitions have resulted in the rationalization of pricing and costs. Companies having high cost structure are being forced to rationalize operations.
2. National financial system is now more closely integrated with international financial system.

1.8 ORGANISATION OF FINANCIAL MANAGEMENT

Organization of financial management means the division and the classification of various functions which are to be performed by the finance department.
In small organizations where partners or proprietors have main say in the running of the firm, no separate finance department is established. At the most they may appoint a person for book keeping and liasioning with banks and debtors.

In medium size organizations a separate department to organize all financial activities may be created at the top level under the direct supervision of the Board of Directors or a very senior executive. The important feature of this type of set up is that there is no further sub division based on various functional areas of finance.

In large size organizations the finance department is further sub divided into functional areas. In these organizations two main sub-divisions are that of the Financial Controller and the Treasurer.

- The Financial Controller is concerned with planning and controlling, preparation of annual reports, capital and working capital budgeting, cost and inventory management maintenance of books and records and pay-roll preparation.
- The treasurer is concerned with raising of funds both short term and long term. In addition to this the treasurer is responsible for cash and receivable management, auditing of accounts, protection and safe keeping of securities and the maintenance of relations with banks and institutions.

1.9 FUNCTIONS OF FINANCIAL MANAGER

The task and responsibilities of finance managers vary from organization to organization depending upon the nature and size of the business, but inspite of these variations the main tasks and responsibilities of finance manager can be classified as follows:

a. Compliance with policy and procedures laid by the Board of Directors.
b. Compliance with various rules and procedures as laid by law.
c. Information generation for various stakeholders.
d. Effective and efficient utilization of funds.

The main tasks and responsibilities of a financial manager are discussed below:

1. **Financial Planning and Forecasting:** Financial manager is also concerned with planning and forecasting of production, sales and level of inventory. In addition to this, he has also to plan and forecast the requirement of funds and the sources from which the funds are to be raised.

2. **Financial Management:** Fund management is the primary responsibility of the finance manager. Fund management includes effective and efficient acquisition, allocation and utilization of funds. The fund management includes the following:
   - ***Acquisition of funds:*** The finance manager has to ensure that adequate funds are available from the right sources at the right cost at the right time. The finance manager will have to decide the mode of raising fund, whether it is to be through the issue of securities or lending from the bank.
   - ***Allocation of funds:*** Once funds are acquired the funds have to be allocated to various projects and services as per the priority fixed by the Board of Directors.
   - ***Utilization of funds:*** The objective of business finance is to earn profiles, which on a very large extent depend upon how effectively and efficiently allocated funds are utilized. Proper utilization of funds is based on sound investment decisions, proper control and asset management policies and efficient management of working capital.
3. **Disposal of Profits:** Finance manager has to decide the quantum of dividend which the company wants to declare. The amount of dividend will depend upon mainly the future requirement of funds for expansion and the prevailing tax policy.

4. **Maximization of Shareholder's Wealth:** The objective of any business is to maximize and create wealth for the investors, which is measured by the price of the share of the company. The price of the share of any company is a function of its present and expected future earnings. The finance managers should pursue policies which maximizes earnings.

5. **Interpretation and Reporting:** Interpretation of financial data requires skills. The finance manager should analyze financial data and find out the reasons for variance from standards and report the same to the management. He should also assess the likely financial impact of these variances.

6. **Legal Obligations:** All the companies are governed by specific laws of the land. These laws relate to payment of taxes, salaries, pension, corporate governance, preparation of accounts etc. The finance manager should ensure that a true and correct picture of the state of affairs should be reflected in the statement of accounts. He should also ensure that the tax returns and others various information should be submitted on time.

CHAPTER TWO

FINANCIAL STATEMENT ANALYSIS

2.1 FINANCIAL STATEMENTS

Financial statements are official documents of the firm, which explore the entire financial information of the firm. Financial statements are the summary of the accounting process, which, provide useful information to both internal and external parties. The main aim of the financial statement is to provide information and understand the financial aspects of the firm. Hence, preparation of the financial statement is important as much as the financial decisions.

The two basic financial statements prepared for the purposes of external reporting are balance sheet and income statement.

A part from that, the business concern also prepares some of other statements, which are very useful to the internal purpose such as: Statement of changes in owner's equity, Statement of changes in financial position.

I. Balance Sheet:

Balance sheet is one of the important financial statements which indicate 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 owner's interest at a specified point of time. One can understand the strength and weakness of the concern with the help of the position statement

II. Income statement:

It is a performance report recording the changes in income, expense, 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.**

III. Statement of Changes in Owner's Equity

It is also called as statement of retained earnings. This statement provides information about the changes or position of owner's equity in the company. How the retained earnings are employed in the business concern. Nowadays, preparation of this statement is not popular and nobody is going to prepare the separate statement of changes in owner's equity.

IV. Statement of Changes in Financial Position

Income statement and balance sheet shows only about the position of the finance, hence it can't measure the actual position of the financial statement. Statement of changes in financial position helps to understand the changes in financial position from one period to another period

Statement of changes in financial position involves two important areas such as fund flow statement which involves the changes in working capital position and cash flow statement which involves the changes in cash position

2.2 FINANCIAL ANALYSIS MEANING AND IMPORTANCE

Financial statements analysis is the process of examining relationships among elements of the company's financial statements and making comparisons with relevant information from the print of view of all parties interested in the affairs of the business.

Analysis and interpretation are closely inter-linked and they are complementary to each other. ***Analysis without interpretation is useless and interpretation without analysis is impossible***.

Financial statements analysis is a valuable tool used by investors, creditors, financial analysts, owners, managers and others in their decision-making process.

Types of Financial Analysis

Analysis of financial statement may be broadly classified into two important types on the basis of material used and methods of operations

Financial statement analysis may be classified into two major types: external analysis and internal analysis.

A. External Analysis

- ☞ Outsiders of the business concern such as investors, creditors, government organizations and other credit agencies do normally external analyses.
- ☞ External analysis is very much useful to understand the financial and operational position of the business concern.

- ☞ External analysis mainly depends on the published financial statement of the concern.
- ☞ This analysis provides only limited information about the business concern.

B. Internal Analysis

- ☞ The company itself discloses some of the valuable information in this type of analysis.
- ☞ This analysis is used to understand the operational performances of each and every department and unit of the business concern.
- ☞ Internal analysis helps to take decisions regarding achieving the goals of the business concern
- ☞ They have access to financial data of the company

2.2 TECHNIQUES OF FINANCIAL STATEMENT ANALYSIS

Financial statement analysis is interpreted mainly to determine the financial and operational performance of the business concern. A number of methods or techniques are used to analyze the financial statement of the business. The following are the common methods or techniques, which are widely used by the business.

1. Comparative Statement Analysis
2. Trend Analysis
3. Common Size Analysis
4. Fund Flow & Cash Flow Statement
5. Ratio Analysis

Comparative Statement Analysis

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

Trend Analysis (Horizontal Analysis)

It is used to evaluate the trend in the accounts over the accounting periods. It is usually shown on a comparative financial statement.

In a horizontal analysis it is essential to show both the amount of the change and the percentage of the change because either one alone might be misleading.

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. 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 is calculated.

To illustrate horizontal financial analysis, let's take sample financial statements of Biftu Company. Its condensed balance sheets for 2011 and 2012 showing birr and percentage changes are presented below.

Exhibit 2-1 Horizontal Analysis of Balance Sheet

Biftu Company
Condensed Balance sheet
December 31 (in millions)

			Increase (Decrease) during 2012	
Assets	2012	2011	Amount	Percent
Current assets	Br. 1,528.6	Br. 1,428.8	Br. 99.8	7.0%
Plant assets (net)	2,932.9	2,784.8	148.1	5.3
Other assets	588.5	201.0	387.5	192.8
Total assets	Br. ***5,050.0***	Br. ***4,414.6***	Br. ***635.4***	***14.4%***
Liabilities stock holder's equity				
Current Liability	Br. 2,199.0	Br. 1,265.4	Br. 933.6	73.8%
Long-term Liabilities	1,568.6	1,558.3	10.3	0.7
Total Liabilities	***3,767.6***	***2,823.7***	***943.9***	***33.4***
Stockholders' equity				
Common stock	201.8	183.0	18.8	10.3
Retained earnings & other	3,984.0	3,769.1	214.9	5.7
Treasury stock (cost)	(2,903.4)	(2,361.2)	542.2	23.0
Total stockholders' equity	1,282.4	1,590.9	(308.5)	(19.4)
Total Liabilities and Stockholders' equity	*Br.* ***5,050.0***	***Br.4, 414.6***	Br. ***635.4***	***14.4%***

The comparative balance sheet above shows that a number of changes occurred in Biftu's financial position from 2011 to 2012.

- In the assets section, current assets increased by Br. 99.8 million, or 7.0% (Br. 99.8 ÷ Br. 1,428.8),
- plant assets (net of depreciation) increased by Br. 148.1, or 5.3%, and other assets increased by 192.8% (Br. 3875 ÷ Br. 201)
- In the liabilities section, current liabilities increased by Br. 933.6, or 73.8%, while long-term liabilities increased by Br. 10.3, or 0.7%.
- In the stockholders' equity section, we find that retained earnings increased by Br. 214.9, or 5.7%.

This horizontal analysis suggests that the **company expanded its asset base during 2012** and financed this expansion primarily by retaining income in the

business and incurring short-term debts. In addition, the company reduced its stockholders' equity by 19.4% by buying treasury stock.

Presented in *exhibit 2.2* is a comparative income statement of Biftu Company for 2011 and 2012 in a condensed format. Horizontal analysis of the income statement shows these changes:

Exhibit 2-2 Horizontal Analysis of Income Statement (in Millions)

Biftu Company
Condensed Income statement
For the year ended December 31

			Increase (Decrease) during 2012	
	2012	2011	Amount	Percent
Net Sales	Br.6,676.6	Br.7,003.7	Br. (327.1)	(4.7%)
Cost of goods sold	3,122.9	3,177.7	(54.8)	(1.7)
Gross Profit	3,553.7	3,826.0	(272.3)	(7.1)
Selling & administrative expenses	2,458.7	2,566.7	(108.0)	(4.2)
Nonrecurring charges	136.1	421.8	(285.7)	(67.7)
Income from operations	958.9	837.5	121.4	14.5
Interest expense	65.6	62.6	3.0	4.8
Other income (expense), net	(33.4)	21.1	(54.5)	NA*
Income before income taxes	859.9	796.0	63.9	8.0
Income tax expense	328.9	305.7	23.2	7.6
Net income	Br. 531.0	Br. 490.3	Br. 40.7	8.3

* NA = Not Available

- Net sales decreased by Br. 327.1, or 4.7% (Br. 327.1 Br. 7003.7).
- Cost of goods sold increased by Br. 54.8, or 1.7% (Br. 54.8 Br. 3,177.7).
- Selling and administrative expenses decreased by Br. 108.0, or 4.2% (Br. 108.0 Br. 2,566.7).
- Overall, gross profit decreased by 7.1% and net income increased by 8.3%.
- The increase in net income can be attributed nearly to the 67.7% decrease from 2011 to 2012 in the nonrecurring charges.

The measurement of changes in percentages from period to period is relatively straightforward and quite useful. However, complications can result in making the computations. If an item has no value in a base year or preceding year and a value in the next year, no percentage change can be computed. And if a negative amount appears in the base or preceding period and a positive amount exists the following year, or vice versa, no percentage change can be computed. For example, no percentage could be calculated for the "other income (expense)" category in Biftu's condensed income statement.

Common Size Analysis (Vertical Analysis)

- It is analysis of financial statements where a significant item in a financial statement is used as a base value and all other items are compared against it. For example, in balance sheet analysis, all balance sheet items might be expressed as percentages of total assets. In income statement analysis, all income statement items might be expressed as percentages of net sales.
- Vertical financial statement analysis is a technique of evaluating and analyzing financial statement data that expresses each item in a financial statement as a percent of the base amount. For example, on a balance sheet, we might say that current assets are 22% of total assets (total assets being the base amount). Or in an income statement, we might say that selling expenses are 16% of net sales (net sales being the base amount).

Exhibit 2.3 presents a vertical analysis of the comparative balance sheet of Biftu Company for 2011 and 2012

- The base for the asset items is total asset, and
- The base for the liability and stockholders' equity items is total liabilities and stockholders' equity.
- In addition to showing the relative size of each category on the balance sheet, vertical analysis may show the %age change in the individual asset, liability and stockholders' equity items.

Exhibit 2-3 Vertical Analysis of Balance Sheet (in Millions)

Biftu Company Condensed Balance sheet December 31	2012		2011	
Assets	Amount	Percent	Amount	Percent
Current assets	Br.1,528.6	30.3 %	Br. 1,428.8	32.4
Plant Assets (net)	2,932.9	58.0	2,784.8	63.0
Other assets	588.5	11.7	201.0	4. 6
Total assets	Br. 5,050.0	100.0 %	Br. 4,414.6	100.0%
Liabilities & Stockholders' equity				
Current liabilities	Br. 2,199.0	43.5%	Br. 1,265.4	28.7
Long-term liabilities	1,568.6	31.1	1,558.3	35.3
Total Liabilities	3,767.6	74.6	2,823.7	64.0
Stockholders' equity:				

Common stock	201.8	4.0	183.0	4.1
Retained earnings & other	3,984.	78.9	3,769.1	85.4
Treasury stock cost)	(2,903.4)	(57.5)	(2,361. 2)	(53.5)
Total stockholders' equity	Br. 1,282.4	25.4	Br. 1,590.9	36.0
Total liabilities & Stockholders' equity	Br 5,050.0	100.0 %	Br. 4,414.6	100.0%

- In this case, even though current assets increased by Br. 99.8 million from 2011 to 2012, they decreased from 32.4% to 30.3% of total assets.
- Plant assets (net) decreased from 63.1% to 58.1% of total assets. Also, even though retained earnings increased by Br. 214.9 million from 2011 to 2012, they decreased from 85.4% to 78.9% of total liabilities and stockholders' equity. This indicates that there is a shift to a higher percentage of debt financing. This is because current liabilities increase by Br. 933.6 million, going from 53.3% to 57.5% of total liabilities and stockholders' equity. Thus, the company shifted toward a heavier reliance on debt financing both by using more short-term debt and by reducing the amount of outstanding equity.

Exhibit 2-4 Vertical Analysis of an Income Statement (in Millions)

ABC Company
Condensed Income Statement
For the years Ended December 31

	2012		2011	
	Amount	Percent	Amount	Percent
Net Sale	Br. 676.6	100.0%	Br. 7,003.7	100.0%
Cost of goods sold	3,122.9	46.8	3,177.7	45.4
Gross Profit	3,553.7	53.2	3,826.0	54.6
Selling & administrative Expenses	2,458.7	36.8	2,566.7	36.6
Non-recurring charges	136.1	2.0	421.8	6.0
Income from operations	958.9	14.4	837.5	12.0
Interest expense	65.6	1.0	62.6	0.9
Other income (expense), net	(33.4)	0.5	21.1	0.3
Income before income taxes	859.9	12.9	796.0	11.4
Income tax expense	328.9	4.9	305.7	4.4
Net Income	Br. 531.0	8.0%	Br. 490.3	7.0%

The vertical analysis of the comparative income statements for Biftu Company, shown in Exhibit 2.4 reveals that;

- cost of goods sold as a percentage of net sales increased by 1.4% (from 45.4% to 46.8%) and
- Selling and administrative expenses increased by 0.2% (from 36.6% to 36.8%). Despite these negative changes, net income as a percentage of net sales increased from 7.0% to 8.0%.

The vertical analysis is, therefore, **used to gain insight into the relative importance or magnitude of various items in the financial statements**. Again an associated benefit of vertical analysis is that it **enables you to compare companies of different sizes**, because each item in the financial statements is expressed in relation to a certain item of the financial statements, regardless of the absolute amounts of the items.

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

RATIO ANALYSIS

Horizontal and vertical analyses compare one figure with another within the same category. It is also essential to compare figures from different categories and this is accomplished through ratio analysis. Ratio analysis is the process of determining and interpreting numerical relationship based on financial statements. It is the technique of interpretation of financial statements with the help of *accounting ratios* derived from the Balance Sheet and Income Statement.

- Ratio shows the mathematical relationship between two figures, which have meaningful relation with each other
- Financial ratio analysis is the most common form of financial statements analysis
- Financial ratio:
  - Is used as an index for evaluating the financial performance of the business.
  - Compare items on a single financial statement or examine the relationships between items on two financial statements
  - Generally hold no meaning unless they are compared against something else, like past performance, another company/competitor or industry average
  - Are also used by bankers, investors, and business analysts to assess various attributes of a company's financial strength or operating results.

- Can be classified into various types

Objectives of Ratio Analysis

- To standardize financial information for comparisons
- To evaluate current operations
- To compare current performance with past performance
- To compare performance against other firms or industry standards
- To study the efficiency of operations
- To study the risk of operations
- To find out the ability of the firm to meet its debts (liquidity).
- To help investors in evaluating sustainability of returns on their investment

Advantages of Ratios Analysis:

Ratio analysis is an important and age-old technique of financial analysis. The following are some of the advantages / Benefits of ratio analysis:

1. **Simplifies financial statements**: Ratios tell the whole story of changes in the financial condition of the business
2. **Facilitates inter-firm comparison**: It provides data for inter-firm comparison. Ratios highlight the factors associated with successful and unsuccessful firm. They also reveal strong firms and weak firms, overvalued and undervalued firms.
3. **Helps in planning**: It helps in planning and forecasting. Ratios can assist management, in its basic functions of forecasting. Planning, co-ordination, control and communications.
4. **Makes inter-firm comparison possible**: Ratios analysis also makes possible comparison of the performance of different divisions of the firm. The ratios are helpful in deciding about their efficiency or otherwise in the past and likely performance in the future.
5. **Help in investment decisions**: It helps in investment decisions in the case of investors and lending decisions in the case of bankers etc

Limitations of Ratios Analysis:

The ratios analysis is one of the most powerful tools of financial management. Though ratios are simple to calculate and easy to understand, they suffer from serious limitations.

1. **Limitations of financial statements**: Ratios are based only on the information which has been recorded in the financial statements. Financial statements themselves are subject to several limitations. Thus ratios derived, there from, are also subject to those limitations. For example, non-financial changes though important for the business are not relevant by the financial statements. Financial statements are affected to a very great extent by accounting conventions and concepts. Personal judgment plays a great part in determining the figures for financial statements.
2. **Comparative study required:** Ratios are useful in judging the efficiency of the business only when they are compared with past results of the business. However, such a comparison only provide glimpse of the past performance

and forecasts for future may not prove correct since several other factors like market conditions, management policies, etc. may affect the future operations.

3. **Ratios alone are not adequate**: Ratios are only indicators; they cannot be taken as final regarding good or bad financial position of the business. Other things have also to be seen.
4. **Problems of price level changes**: A change in price level can affect the validity of ratios calculated for different time periods. In such a case the ratio analysis may not clearly indicate the trend in solvency and profitability of the company. The financial statements, therefore, be adjusted keeping in view the price level changes if a meaningful comparison is to be made through accounting ratios.
5. **Lack of adequate standard**: No fixed standard can be laid down for ideal ratios. There are no well accepted standards or rule of thumb for all ratios which can be accepted as norm. It renders interpretation of the ratios difficult
6. **Limited use of single ratios**: A single ratio, usually, does not convey much of a sense. To make a better interpretation, a number of ratios have to be calculated which is likely to confuse the analyst than help him in making any good decision.
7. **Personal bias**: Ratios are only means of financial analysis and not an end in itself. Ratios have to be interpreted and different people may interpret the same ratio in different way.
8. **Incomparable**: Not only industries differ in their nature, but also the firms of the similar business widely differ in their size and accounting procedures etc. It makes comparison of ratios difficult and misleading

Classification of Ratio

☞ Classification from the point of view of financial management is as follows:

A. Liquidity Ratio
B. Activity Ratio
C. Solvency Ratio
D. Profitability Ratio
E. Market value ratios

A. Measures of Liquidity (Liquidity Ratios)

Liquidity ratios measure a firm's ability to meet short term obligations with short-term assets. It is essential for a firm to be able to meet its obligations as they become due. Liquidity ratios are highly useful to creditors and commercial banks that provide short-term credit. **A firm should ensure that it does not suffer from lack of liquidity, and does not have excess liquidity.** Both inadequate and excess liquidity are not desirable. Therefore, it is necessary for the firm to strike a proper balance between high liquidity and lack of liquidity

- Higher the liquidity ratios, higher will be the liquidity position.

- Higher the liquidity ratios, higher will be the amount of Working Capital (WC).
- Working capital means excess of Current Assets (CA) over Current Liabilities (CL).

The most commonly used liquidity ratios are the following:

1) Current Ratio

It is the relationship between current assets and current liabilities. Current ratio measures the ability of the firm to meet its short-term obligations with its current assets.

- It is the most commonly used measure of short-term solvency
- It is determined by dividing current assets by current liabilities.
- The higher the ratio, the more liquid the firm is
- However, if the ratio is too high, the firm may have an excessive investment in current assets
- It may also indicate an underutilization of short-term credit.
- A low current ratio indicates that the firm is having difficulty in meeting short-term commitments and the liquidity position of the firm is not safe

$$\textbf{Current Ratio} = \frac{Current\ Assets}{Current\ Liabilities}$$

As an example, the current ratio for Biftu Co. can be computed from Exhibit 2.1 for year 2012 as:

$$\text{Current Ratio} = \frac{Current\ Assets}{Current\ Liabilities} = \frac{1,528\,6}{2,199\,0} = 0.695$$ implying that for each Birr of current liability the Company owes others, it has only seventy cents of current assets available.

Interpretation of Current Ratio

- Acceptable current ratio values vary from industry to industry
- As a conventional rule, current ratio of **2:1** is considered satisfactory for merchandising firms.
- However, the arbitrary ratio of 2:1 should not be, blindly, followed.
- Firms with less than 2:1 ratio may become meeting the liabilities without difficulties, though firms with a ratio of more than 2:1 may have difficulty to meet their obligation
- High ratio indicates under trading and over capitalization and vice-versa for low ratio.

Current ratio is a test of quantity, not test of quality. It is essential to verify the composition and quality of assets before, finally, taking a decision about the adequacy of the ratio.

Limitations of Current Ratio:

It is a measure of liquidity and should be used very carefully because it suffers from many limitations. It is, therefore, suggested that it should not be used as the sole index of short term solvency.

1. It is crude ratio because it measures only the quantity and not the quality of the current assets.
2. Even if the ratio is favorable, the firm may be in financial trouble, because of more stock and work in process which is not easily convertible into cash, and, therefore firm may have less cash to pay off current liabilities.
3. Window dressing: It can be very easily manipulated by overvaluing the current assets.
4. An equal increase in both current assets and current liabilities would decrease the ratio and similarly equal decrease in current assets and current liabilities would increase current ratio.
5. Current ratio is also affected by seasonality.

The current ratio can yield misleading results under the following circumstances:

- ***Inventory component.*** When the current assets figure includes a large proportion of inventory assets, since these assets can be difficult to liquidate.
- ***Paying from debt.*** When a company is drawing upon its line of credit to pay bills as they come due, this means the cash balance is near zero. Hence, the current ratio could be fairly low, and yet the presence of a line of credit still allows the business to pay in a timely manner

2) Quick Ratio (Acid Test Ratio)

- Quick Ratio uses all current assets except inventory for measuring the liquidity of the firm.
- The ratio measures the firm's ability to meet current liabilities from its most liquid assets.
- Inventory is the least liquid of the current assets and may not be easily converted into cash.
- Quick ratio is used as a complementary ratio to the current ratio.
- Quick ratio is more rigorous test of liquidity than the current ratio because it eliminates inventories and prepaid expenses.
- Usually high quick ratios indicate the firm's ability to meet its current liabilities in time.
- On the other hand a low liquidity ratio represents that the firm's liquidity position is not good.
- As a convention, generally, a quick ratio of "one to one" (1:1) is considered to be satisfactory.

$$\textbf{Quick Ratio} = \frac{Current\ Assets - Inventories - Prepayments}{Current\ Liabilities}$$

For Biftu Company, assuming that inventories and prepayments respectively are Br. 600 and Br. 250 (in millions), the quick ratio for the year 2012 can be shown as:

Quick Ratio = $\frac{Current\ Assets - Inventories - Prepayments}{Current\ Liabilities} =$

$\frac{1,528 - 600 - 250}{2,199} = 0.309$. This shows that for each Birr of current liability the Company owes, there are only thirty cents in fast converting assets to settle the obligations. Both measures of liquidity reveal that Biftu Company is not in good posture in terms of liquidity.

Interpretation of Quick Ratio

- Quick ratio of **1:1** is generally considered satisfactory.
- However, firms with the ratio of more than **1:1** need not be liquid and those having less than the standard need not, necessarily, be illiquid.
- It depends more on the composition of liquid assets.
- Debtors, normally, constitute a major part in liquid assets. If debtors are slow paying, doubtful and long outstanding, they may not be totally liquid.
- A liquid ratio of **1:1** does not necessarily mean satisfactory liquidity position if all the debtors cannot be realized.
- In the same manner, a low liquid ratio does not necessarily mean a bad liquidity position as inventories are not absolutely non-liquid.
- Hence, a firm having a high liquidity ratio may not have a satisfactory liquidity position if it has slow-paying debtors.
- On the other hand, a firm having a low liquid ratio may have a good liquidity position if it has fast moving inventories

3) Cash Ratio interpretation

- Cash Ratio is an indicator of company's short-term liquidity. It measures the ability to use its cash and cash equivalents to pay its current financial obligations.
- Cash ratio measures the immediate amount of cash available to satisfy short-term liabilities. A cash ratio of **0.5:1** or higher is preferred.
- Cash ratio is the most conservative look at a company's liquidity since is taking in the consideration only the cash and cash equivalents.
- Cash ratio is used by creditors when deciding how much credit, if any, they would be willing to extend to the company.

Cash Ratio = $\frac{Cash + Marketable\ Securities}{Current\ Liabilities}$

For Biftu Company, assuming that cash and marketable securities respectively are Br. 100 and Br. 150 (in millions), the quick ratio for the year 2012 can be shown as:

$$\textbf{Cash Ratio} = \frac{Cash + Marketable\ Securities}{Current\ Liabilities} = \frac{100 + 150}{2,1990} = 0.11$$

This shows that for each Birr of current liability the Company owes, there are only eleven cents in absolute assets to settle its obligations

B. ACTIVITY RATIO(Asset Utilization Ratios)

These ratios are also called measures of Efficiency ratios. They show the intensity with which the firm uses its assets in generating sales. These ratios indicate whether the firm's investments in current and long-term assets are too small or too large. If investment is too large, it could be that the funds tied up in that asset should be used for more productive purposes.

The following are the most important asset utilization ratios:

1) Inventory Turnover Ratio (ITOR)

It is a relationship between the cost of goods sold and average inventory. Inventory turnover ratio:

- Measures the velocity of conversion of stock into sales
- Indicates the number of times stock has been turned into sales
- Is expressed in number of times
- Evaluates the efficiency with which a firm is able to manage its inventory.
- Indicates whether investment in stock is within proper limit or not
- Can be judged only after comparing it with some standard figure such as industry average or the Company's past values for this figure

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

Assuming the inventory value of Br. 600 (in millions) as in the quick ratio, Biftu Company's inventory turnover for 2012 is computed as:

$$\text{Inventory Turnover} = \frac{Cost\ of\ Goods\ Sold}{Average\ Inventory} = \frac{3,122,90}{600,00} = 5.2\ time.$$

A **low inventory turnover ratio:**

- Is a signal of inefficiency, either poor sales or excess inventory
- May indicate poor liquidity, possible overstocking, and obsolescence,
- May also reflect a planned inventory buildup
- Indicates efficient management of inventory
- Signifies more profit
- Implies a large investment in inventories relative to the amount needed to service sales

A **high inventory turnover ratio:**

- Implies either strong sales or ineffective buying
- Indicates an inefficient management of inventory
- May be due to under-investment in inventories
- May indicate better liquidity, but it can also indicate a shortage inventory levels, which may lead to a loss in business.

- Implies over-investment in inventories, dull business, poor quality of goods, stock accumulation, accumulation of obsolete and slow moving goods and low profits as compared to total investment
- Implies that the purchasing function is tightly managed
- Inventory level must be relative to sales that are not excessive but sufficient to meet customers' needs

The following issues can impact the amount of inventory turnover:

- ***Seasonal build***. Inventory may be built up in advance of a seasonal selling reason.
- ***Obsolescence***. Some portion of the inventory may be out-of-date and so cannot be sold.
- ***Cost accounting***. The costing method used, combined with changes in prices paid for inventory, can result in significant swings in the reported amount of inventory.
- ***Flow method used***. A "pull" system that only manufactures on demand requires much less inventory than a "push" system that manufactures based on estimated demand.

2) Receivables Turnover Ratio (RTOR)

Accounts receivable represents the indirect interest free loans that the company is providing to its customer. Therefore, it is very important to know how **"costly"** these loans are for the company. Accounts Receivable Turnover Ratio is one of the efficiency ratios and measures the number of times receivables are collected, on average, during the fiscal year.

Receivables turnover ratio:

- Measures **Company's efficiency in collecting its sales on credit** and collection policies.
- Takes in to consideration ONLY the net credit sales.
- Will be affected and may lose its significance if the cash sales are included.
- It is best to use average accounts receivable to avoid seasonality effects.

$$\text{Receivables Turnover} = \frac{Credit\ Sales}{Accounts\ Receivable}$$

For Biftu Company, this ratio for 2012 would be $\frac{600}{259} = 2.32 \text{ times}$

A **high receivables turnover ratio:**

- Implies either that the company operates on a cash basis or that its extension of credit and collection of accounts receivable are efficient.
- Indicate reflects a short lapse of time between sales and the collection of cash,
- Indicate efficiency in the management of receivables and liquidity
- indicates a combination of conservative credit policy and aggressive collections department

A **low receivables turnover ratio:**

- Indicate longer collection period
- Indicate poor receivables collection procedures and credit policies
- Implies high risk of uncollectibility
- Is an indication of greater collection expenses
- May be caused by a loose or nonexistent credit policy, or an inadequate collections function

If the ratio is going up, either collection efforts may be improving, sales may be raising or receivables are being reduced.

$$\text{Receivables Turnover} = \frac{Credit\ Sales}{Accounts\ Receivable}$$

3) Average Collection Period (Days Sales Outstanding)

Average Collection Period represents the average number of days it takes the company to convert receivables into cash. The DSO represents the average length of time that the firm must wait after making a sale before receiving cash. Average Collection Period:

- measures the quality of debtors
- can also be evaluated by comparison with the terms on which the firm sells
- should be the same or lower than the company's credit terms
- Should not exceed credit terms by more than 10-15 days
- Use average accounts receivable to avoid seasonality effects
- Is computed by dividing the receivables turnover ratio into 365 days

Short Collection period:

- Implies prompt payment by debtors.
- Reduces the chances of bad debts.

Longer Collection period:

- Implies too liberal and inefficient credit collection performance.
- It is difficult to provide a standard collection period of debtors

If the trend in average collection period over the past few years has been rising, but the credit policy has not been changed, this would be strong evidence that steps should be taken to speed up the collection of accounts receivable.

$$\text{Average Collection Period} = \frac{Accounts\ Receivable}{Average\ Credit\ Sales\ per\ Day}$$

$$\text{Average Credit Sales per Day} = \frac{Annual\ Credit\ Sales}{360\ Days}$$

For Biftu Company, the average collection period, assuming accounts receivable of Br. 259 and credit sales of Br. 600 (both in millions), can be computed as:

Average Collection Period $= \frac{Accounts\ Receivable}{Average\ Credit\ Sales\ per\ Day} = \frac{259}{1.67} = 155$ days

4) Fixed Assets Turnover

It indicates how intensively the fixed assets of the firm are being used.

Fixed Assets Turnover $= \frac{Sales}{FixedAsset}$. The value of this ratio for Biftu Company for the year 2012 is $\frac{6,6766}{2,9329} = 2.28$ times

- If fixed assets have changed significantly during the year, an average fixed asset level for the year, like inventory, should be used.
- A low ratio implies excessive investment in plant and equipment relative to the value of output being produced. In such a case, the firm might be better off to liquidate some of the fixed assets and invest the proceeds productively.

5) Total Assets Turnover

- Total Assets Turnover helps measure the efficiency with which firms use their assets.
- It reflects how well the company's assets are being used to generate sales

Total Assets Turnover $= \frac{Sales}{TotalAsset}$. For Biftu Company, this ratio for the year 2012 stands as $\frac{6,6766}{5,0500} = 1.32$ times

- A low ratio indicates excessive investment in assets. Generally firms prefer to support a high level of sales with a small amount of assets, which indicates efficient utilization of assets.
- High total assets turnover ratio may indicate that the firm is using old, fully depreciated assets that may be inefficient.

C. LEVERAGE RATIOS OR CAPITAL STRUCTURE RATIOS

These ratios are also known as 'long term solvency ratios' or 'capital gearing ratios.' Long-term creditors 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. These ratios:

- Indicate the ability of the company to survive over a long period of time
- Indicate the ability of the organization to repay the loan and interest.
- Indicate the extent to which the firm has used debt in financing its assets.

The most commonly calculated leverage ratios include:

1. Debt to total asset ratio (Debt Ratio)
2. Debt equity ratio.
3. Times Interest Earned Ratio (TIER)
4. Fixed Charges Coverage Ratio (FCCR)

1. Debt to total asset ratio (Debt Ratio)

The debt ratio indicates the percentages of a firm's total assets that are financed with borrowed funds. $\text{Debt Ratio} = \frac{Total Debts}{Total Assets}$

For Biftu Company, the debt ratio for the year 2012 appears as $\frac{3,767.6}{5,050} = 0.75$ or 75%.

- Creditors usually prefer a low debt ratio since it implies a greater protection of their position.
- A higher debt ratio generally means that the firm must pay a higher interest rate on its borrowing; beyond some point, the firm will not be able to borrow at all.

2. Debt-Equity Ratio

- Debt to Equity is the ratio of total debt to total equity
- Ii is one of the measures of the long-term solvency of a firm.
- It measures the relative claims of creditors and owners against the assets of the firm
- It compares the funds provided by creditors to the funds provided by shareholders.
- It measures the soundness of the long term financial policies of the company
- As more debt is used, the Debt to Equity Ratio will increase.
- The use of debt can help improve earnings since deduct interest expense on the tax return
- For the analysis of capital structure of a firm debt-equity ratio is important

NB: ***The outsiders' funds include all debts / liabilities to outsiders, whether long term or short term or whether in the form of debentures, bonds, mortgages or bills. The shareholders funds consist of equity share capital, preference share capital, capital reserves, revenue reserves, and reserves representing accumulated profits and surpluses like reserves for contingencies, sinking funds, etc***

$$\text{Debt-Equity Ratio} = \frac{Long Term Debt}{Stockholders' Equity}$$

For Biftu Company, this ratio for 2012 is $\frac{1,568.6}{1,282.4} = 1.22$.

Interpretation of Debt-Equity ratio

- Long-term creditors generally prefer to see a modest debt-equity ratio.
- A high debt equity ratio implies that a higher proportion of long-term financing is from debt.
- A low ratio means the firm has paid for its assets mainly with equity money
- The D-E ratio indicates the margin of safety to the creditors.

- A very high D-E ratio is **unfavorable** to the firm and creates inflexibility in 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.
- An ideal D-E ratio is 1:1
- 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.

3. Times Interest Earned Ratio (TIER)

The TIER measures the ability of the firm to service its debt. In other words, it measures the ability to pay interest out of its earnings. It shows how many times the interest payments are covered by funds that are normally available to pay interest expense.

$$\text{TIER} = \frac{EBIT}{Interest\ Expense}.$$

For Biftu Company, the TIER will be $\frac{9589}{656} = 14.62$ times for 2012.

The creditors may not like a low ratio on the ground that the company uses more debt or doesn't generate sufficient income to cover the interest expense. The higher the ratio, the stronger is the interest paying ability of the firm. If it is too high, stockholders may feel that the firm is not taking advantage of the benefits provided by financial leverage, i.e. the firm doesn't use enough debt to finance its operations.

4. Fixed Charges Coverage Ratio (FCCR)

Like the TIER, the FCCR is a measure of the ability of the firm to pay its fixed financing costs. It indicates how much income is available to pay for all the firm's fixed charges.

$$\text{FCCR} = \frac{Income\ Available\ for\ Meeting\ Fixed\ Charges}{Fixed\ Charges}$$

$$\text{FCCR} = \frac{EBIT + Lease\ Payments}{Interest\ Payment + Lease\ Payment}$$

The FCCR is similar to the TIER. A higher ratio will indicate that the company is able to pay the fixed charges and will satisfy the creditors.

D. MEASURES OF PROFITABILITY (PROFITABILITY RATIOS)

Profitability Ratios indicate the success of the firm in earning a net return on sales, total assets, and invested capital and also show the combined effects of liquidity, asset management and debt management on operating results.

There are different users interested in knowing the profits of the firm.

- The management of the firm regards profits as an indication of efficiency
- 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, measures of the firm's tax paying ability and a basis for legislative action.
- To the customers they are a hint for demanding price cuts.

The following are the main profitability ratios:

1. Gross Profit Margin

- Gross Profit Margin indicates the percent of each sales dollar remaining after cost of goods sold has been subtracted.
- It also reflects the effectiveness of pricing policy and of production efficiency.

Gross Profit Margin = $\frac{Sales - Cost of Goods Sold}{Sales}$.

For Biftu Company, gross profit margin for 2012 is $\frac{6,676 - 3,129}{6,676} = 0.53$ or 53%.

2. Operating Margin

- The net operating margin indicates the profitability of sales before taxes and interest expenses.
- This ratio measures the effectiveness of production and sales of the company's product in generating pretax income for the firm.

Operating Margin = $\frac{Operating Income}{Sales}$.

For Biftu Company, this ratio would amount to $\frac{958}{6,676} = 0.14$ or 14%.

- Generally the higher the net operating margin the better the company is.

3. Net Profit Margin

- Net profit margin is a measure of the percent of each dollar of sales that flows through to the stockholders as net income.
- It shows what percent of every sales dollar the firm was able to convert into net income.
- Firms with a low volume of sales may need a higher profit margin to generate a satisfactory return for its shareholders.

Net Profit Margin = $\frac{Net Income}{Sales}$.

For Biftu Company, this ratio for 2012 is $\frac{531}{6,676} = 0.08$ or 8%.

- Generally the stockholders always like to have a higher net profit margin.

4. Return on Investment

- It is also referred to as Return on Assets. It measures the return to the firm as a percentage of the total amount invested in the firm or how profitable the firm used its assets.

$$\text{ROI} = \frac{Net Income}{Total Asset}$$

The value of this ratio for Biftu Company for the year 2012 is $\frac{531}{5,050} = 0.105$ or 10.5%.

- Managers generally prefer this ratio to be very high for their firms. However, a high ratio can also mean that the firm is failing to replace worn-out assets.
- A low return on assets shows that the firm is not utilizing its assets profitably.

5. Return on Equity (ROE)

This ratio measures the return earned on the owners' (both preferred and common stockholders) investment in the firm. Generally, the higher this return, the better off is the owners. Return on equity is calculated as follows:

$$\text{Return on Equity (ROE)} = \frac{Net Income}{Stockholder Equity}$$

$$Return\ on\ Equity\ (ROE) = (Return\ on\ Assets) \left[\frac{Total\ Assets}{Shareholders'\ Equity}\right]$$

$$Return\ on\ Equity = \frac{Net\ Income}{Sales} \quad \frac{Sales}{Total\ Assets} \quad \frac{Total\ Assets}{Stockholder's\ Equity}$$

This ratio for Biftu Company for 2012 is $\frac{531}{1,2824} = 0.41$ or 41%.

- It is the duty and objective of the management to generate maximum return on shareholders' investments in the firm. Common
- Stockholders prefer ROE to be very high, since it indicates high returns relative to their investment. However, if the return is abnormally high, it may increase the risk and therefore the reasons must be determined.

(E) Market Value Ratios

These ratios relate the firm's stock price with its earnings and book value per share.

1) Price Earnings Ratio:

- Used to assess the owner's appraisal of share value.
- It also measures the amount investors are willing to pay for each Birr of the firm's earnings.
- The level of P/E ratio indicates the degree of confidence that investors have in the firm's future performance.

$$Price\ Earnings\ Ratio = \frac{Market\ price\ per\ Share\ of\ Common\ Stock}{Earnings\ Per\ Share}$$

- A rise in the price earnings ratio could be seen as a signal of increase in the market value of the firm's stocks.

2) Market/Book Ratio:

- The ratio of a stock's market price to its book value gives another indication of how investors regard the company.
- Firms with relatively high rates of return on equity generally sell at higher multiples of book value than those with low return.

$$\text{Market/Book Ratio} = \frac{Market\ Price\ Per\ shar}{Book\ value\ per\ Share}$$

$$\text{Book Value per Share} = \frac{Common\ Equity}{Common\ Shares\ Outstanding}$$

1) **Dividend Ratios:** The primary interest of stockholders on a company's operation is to see whether it pays a good amount of dividend or not. The two ratios relative to dividends are:

$$\text{Dividend Yield} = \frac{Dividend\ Per\ Share}{Market\ Price\ per\ share}$$

$$\text{Dividend payout} = \frac{Dividend\ per\ Share}{Earnings\ per\ share}$$

Determining the Market Value Ratios

Stockholders' equity:	**2009**	**2008**
Preferred stock (Br. 1 par)	200	200
Common stock	4,822	3311
Retained earnings	18,355	15784
Total stockholders' equity	23,377	19,295

Additional Information:

1) The total number of common shares outstanding on December 31, 2009 and 2008 were Br. 3,375 and Br. 3,796 shares respectively.
2) The preferred stocks pay a dividend of Br. 0.5 per share out of total net profits of Br. 4,572; (i.e., earnings per share = 4,472/3,375 = Br. 1.325, assume dividend per share = Br. 0.9).
3) Capital's shares are currently trading for Br. 9/share

Required: Compute price Earnings ratio and dividend yield ratio for 2009.

Key: P/E ratio = $= \frac{Market\ Price\ Per\ shar}{Book\ value\ per\ Share} = \frac{9}{1.325} =$ *6.79 per share*

$$\text{Dividend yield} = = \frac{Dividend\,Per\,Share}{Market\,Price\,per\,share} = \frac{0.9}{9} = 0.1 = 10\%$$

CHAPTER 3:
TIME VALUE OF MONEY AND CONCEPT OF INTEREST

THE CONCEPT OF TIME VALUE OF MONEY

A dollar on hand today is worth more than a dollar to be received in the future because the dollar on hand today can be invested to earn interest to yield more than a dollar in the future. The Time Value of Money mathematics quantifies the value of a dollar through time. This, of course, depends upon the rate of return or interest rate which can be earned on the investment.

The Time Value of Money has applications in many areas of Corporate Finance including Capital Budgeting, Bond Valuation, and Stock Valuation. For example, a bond typically pays interest periodically until maturity at which time the face value of the bond is also repaid. The value of the bond today, thus, depends upon what these future cash flows are worth in today's dollars.

The Time Value of Money concepts will be grouped into two areas: Future Value and Present Value. Future Value describes the process of finding what an investment today will grow to in the future. Present Value describes the process of determining what a cash flow to be received in the future is worth in today's dollars

REASONS FOR TIME VALUE OF MONEY

Money has time value because of the following reasons:

1. Risk and Uncertainty: Future is always uncertain and risky. Outflow of cash is in our control as payments to parties are made by us.
There is no certainty for future cash inflows. Cash inflows are dependent out on our Creditor, Bank etc. As an individual or firm is not certain about future cash receipts, it prefers receiving cash now.

2. Inflation: In an inflationary economy, the money received today, has more purchasing power than the money to be received in future.
In other words, a rupee today represents a greater real purchasing power than a rupee a year hence.

3. Consumption: Individuals generally prefer current consumption to future consumption.

4. Investment opportunities: An investor can profitably employ a rupee received today, to give him a higher value to be received tomorrow or after a certain period of time.
Thus, the fundamental principle behind the concept of time value of money is that, a sum of money received today, is worth more than if the same is received after a certain period of time.

TECHNIQUES OF TIME VALUE OF MONEY

There are two techniques for adjusting time value of money.

1. Compounding Techniques/Future Value Techniques
2. Discounting/Present Value Techniques

The value of money at a future date with a given interest rate is called future value. Similarly, the worth of money today that is receivable or payable at a future date is called **Present Value**.

Compounding Techniques/Future Value Technique

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

FOR EXAMPLE:

Suppose you invest Br1,000 for three years in a saving account that pays 10 percent interest per year. If you let your interest income be reinvested, your investment will grow as follows

First year:	Principal at the beginning	1,000	
	Interest for the year (` 1,000 × 0.10)		100
	Principal at the end	1,100	
Second year:	Principal at the beginning		1,100
	Interest for the year (` 1,100 × 0.10)		110
	Principal at the end	1210	
Third year:	Principal at the beginning	1210	
	Interest for the year (` 1210 × 0.10)		121
	Principal at the end	1331	

This process of compounding will continue for an indefinite time period.
The process of investing money as well as reinvesting interest earned there on is called *Compounding*. But the way it has gone about calculating the future value will prove to be cumbersome if the future value over long maturity periods of 20 years to 30 years is to be calculated.
A generalized procedure for calculating the future value of a single amount compounded annually is as follows:

Formula: $FVn = PV\ (1 + r)^n$

In this equation $(1 + r)^n$ is called the future value interest factor (FVIF).
Where,

FVn = Future value of the initial flow n year hence
PV = Initial cash flow
r = Annual rate of Interest
n = number of years

By taking into consideration, the above example, we get the same result.

$FVn = PV\ (1 + r)n$
$= 1,000\ (1.10)3$

FVn **= 1331**

To solve future value problems, we consult a future value interest factor (FVIF) table. The table shows the future value factor for certain combinations of periods and interest rates. To simplify calculations, this expression has been evaluated for various combinations of '*r*' and '*n*'.

Discount Rate: Discount rate is the rate at which present and future cash flows are traded-off. It incorporates the above factors. Greater present consumption entails higher discount rates. Individuals with greater present consumption require higher rewards for giving their present consumption up. Higher expected inflation also requires application of higher discount rates as lenders (savers) want to be compensated for the expected decline in the purchasing power of their money. Higher risks would as well necessarily lead to higher discount rates.

Discounting: Discounting is the process of moving cash flows that are expected to occur in the future back to their present worth using discount rates. It converts future cash flows to present value terms.

Compounding: Compounding is the process of moving present cash flows to their future worth, using discount rates.

1.1 Interest and Interest Rate

The first basic point in the concept of the time value of money is to understand the meaning of interest. Interest is the cost of using money (capital) over a specified time period. There are two basic types of interest—simple interest and compound interest.

Simple interest can be understood in two different ways. One is that simple interest is an interest computed for just a period. If interest is computed for one period only, the interest is always simple interest. Another way to understand simple interest is that it is an interest computed for two or more periods whereby only the principal (original) value would earn interest. In simple interest the previously earned interests do not produce another interest.

Compound interest, on the other hand, is an interest computed for a minimum of two periods whereby the previous interests produce another interest for subsequent or next periods. Here both the principal and previous interests bring additional interests.

Though we have discussed both simple and compound interest, in financial management we are largely interested in compound interest. So in the sections that follow we shall discuss the concepts and techniques of the time value of money in the context of compound interest.

The interest rate paid to lenders depends on the factors mentioned above. The size of the interest rate depends on the following factors:

(a) The rate of return expected to be earned on the invested capital. If the borrower expects to earn higher return from invested capital, they will be ready to pay higher interest rates. On the other hand, when there are investment opportunities with higher expected returns, lenders will have options to invest their money; hence they seek higher rates.
(b) The lenders (savers) preference of current versus future consumptions. Lenders with desperate needs for current consumption require higher rates to give it up. On the other hand, those with higher needs for future consumption (such as retirement) require lower interest rates.
(c) The riskiness of the loan. When the borrower is assumed to have higher probability of default, lenders require higher interest rates.
(d) The expected future rate of inflation. As repeatedly discussed in this chapter, inflation erodes the purchasing power of money and when expecting it lenders (savers) charge an interest they believe would compensate them for the decline in value of their money.

Interest Rate Levels

Like any commodity capital is allocated by its price (interest rate) which, in a pure market economy, is determined by the forces of demand and supply. Increase in the demand for debt capital pushes interest rates up, and decreases in the demand for capital, in times of recession, pulls it lower. Increase in the total supply of debt capital reduces interest rates. A decrease in the supply creates shortage of funds in the market and those firms with profitable investment tend to attract capital away from less profitable firms by paying higher interest rates.

Determinants of Interest Rates: The quoted interest rate on a debt security, K, is composed of a real risk free rate of interest plus premiums for inflation, risk, and liquidity. Thus, K can be written as a sum of the risk free rate and premiums for the different risks as follows:

K =K* + IP + DR + LP + MRP
Where:
K*= the real risk free rate.
IP = Inflation Premium (the average expected inflation rate over the life of the security)
DRP = Default Risk Premium
LP = Liquidity Premium or Marketability Premium
MRP = Maturity Risk Premium (the risk related to price declines during the term of the security)

The explanation of each variable follows:

The Real Risk-Free Rate (K*):

This is the interest rate that would exist on a risk less security if no inflation is expected. This is a no risk-no inflation interest rate. This rate changes over time depending on economic conditions. It is the rate of return that businesses and other borrowers expect to earn on a productive asset; and is the upper limit borrowers can afford. People's time preferences of current versus future consumptions determine the amount income savers are ready to defer, hence the amount of funds available (supply of funds). The indexed rates on treasury or government bonds are considered as real risk free rates.

The Inflation Premium (IP):

Inflation affects interest rates because it reduces the purchasing power of money and lowers the real rate of return on investments. As a result, the required rate of return by investors (lenders) incorporates the expected inflation rate over the life of the security. Note that the current inflation rate is not relevant as the rate determination deals only with the future. Assume, for instance, that Ato Dhaba has acquired one-year Br.100.00 government bonds with an annual interest rate of 5%. After one year Ato Dhaba receives Br.105.00. Assume also that the inflation rate over the year was 10%. The real amount Ato Dhaba has received considering inflation is Br. 105.00/1.1, Br. 95.455. This implies that a rational investor will require a return of real risk free rate plus the expected inflation rate over the life of the security, which equals:

KRF = K* + IP → (Termed as Nominal (Quoted) Risk-Free Rate of Interest (KRF)

Default Risk Premium (DRP):

Default risk is the risk that a borrower will default on loan, which means not paying the interest or principal of the loan at the stated amount at the stated time. Hence, a rational investor requires a premium for taking this risk. The higher default risk the higher the interest rate.

Liquidity Premium (LP):

Another risk considered in setting an interest rate by an investor is liquidity (marketability) risk. This is the risk that some securities cannot be converted into cash at a reasonable price within short notice.

Maturity Risk Premium (MRP):

This is the risk that the principal of a debt security decreases due to increase in the market interest rates. As interest rate increases the selling price of the bond declines because investors will be interested on the newly issued bonds and require a discount to buy old bonds with lower interest rates. The discount on the bond compensates the loss from periodic interests. A rational investor requires additional income to take this risk. Short-term debts, on the other hand, have low interest rate risk. However, short-term rates are exposed to reinvestment risk.

Which Interest Rate is Higher: Short-Term or Long-Term?

The interest rates on long-term and short-term securities differ in the terms of the above factors. When short-term debts are exposed to more of the above risks their rates will be higher than the long-term rates and vice versa. Under normal circumstances, however, long-term notes are exposed more to the above risks and hence have higher rates. This is because of the following:

Inflation: If inflation is expected to increase, which usually is the case, long-term debts will experience higher average expected inflation rates than shot-term notes; hence will have higher interest rate.

Default Risk: The default risk of a one-year debt could be assessed with more certainty than a twenty-year debt. Hence, the default risk is higher for long-term notes justifying higher interest rates.

Liquidity Risk: Investors are more interested in debts with short maturities. This makes long-term debts less liquid, causing more liquidity risk.

Maturity Risk: If interest rates are expected to increase, the maturity risk is higher for long-term notes.
In general, interest rates charged on debts are affected by economic conditions, inflation and riskiness of the security in terms of liquidity, maturity and default. Investors require premium, on top of the real risk-free rate, for any factor mentioned above. The factors mentioned above, under normal circumstances, affect long-term debts more than the short term ones. Hence long-term notes, in general, have higher interest rates than short-term debts.

1.2 The Future Value of Money

Future value (FV) is the amount to which a cash flow or cash flows will grow over a given period of time when compounded at a given interest rate. Future value is always a direct result of the compounding process.

A. Future Value of a Single Amount

This is the amount to which a specified single cash flow will grow over a given period of time when compounded at a given interest rate. The formula for computing future value of a single cash flow is given as:

$$FVn = PV (1 + i)n$$

Where:

FVn = Future value at the end of n periods
PV = Present Value, or the principal amount
i = Interest rate per period
n= Number of periods

Or

$$FVn = PV (FVIF\ i, n)$$

Where:

(FVIF i, n) = The future value interest factor for i and n

The future value interest factor for i and n is defined as $(1 + i)n$ and it is the future value of 1 Birr for n periods at a rate of i percent per period.

Example: Ayantu deposited Br. 1,800 in her savings account in September 2008. Her account earns 6 percent compounded annually. How much will she have in September 2015?

To solve this problem, let us identify the given items: PV = Br, 1,800; i = 6%; n = 7

FVn = PV (1 + i)n
= Br. 1,800 (1.06)7
= Br. 2,706.53

The (FVIF i, n) can be found by using a scientific calculator or using interest tables given at the end of financial management books. From such tables, by looking down the first column to period 7, and then looking across that row to the 6% column, we see that FVIF 6%, 7 = 1.5036. Then, the value of Br. 1,800 after 7 years is found as follows:

FVn = PV (FVIF i, n)
FV7 = Br. 1,800 (FVIF6%, 7)
= Br. 1,800 (1.5036) = Br. 2,706.48

B. Future Value of an Annuity

An annuity is a series of equal periodic rents (receipts, payments, withdrawals, or deposits) made at fixed intervals for a specified number of periods. For a series of cash flows to be an annuity four conditions should be fulfilled.

1. The cash flows must be equal.
2. The interval between any two cash flows must be fixed.
3. The interest rate applied for each period must be constant.
4. Interest should be compounded in same manner during each period.

If any one of these conditions is missing, the cash flows cannot be an annuity. Basically, there are two types of annuities namely ordinary annuity and annuity due. Broadly speaking, however, annuities are classified into three types:

i) Ordinary Annuity,
ii) Annuity Due, and
iii) Deferred Annuity

(i) Future Value of an Ordinary Annuity:

An ordinary annuity is an annuity for which the cash flows occur at the end of each period. Therefore, the future value of an ordinary annuity is the amount computed at the period when exactly the final (nth) cash flow is made. Graphically, future value of an ordinary annuity can be represented as follows:

0 1 2 ---------- n

PMT_1 PMT2 ---------- PMT n

The future value is computed at point n where PMT n is made.

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

Where:

FVA n = Future value of an ordinary annuity
PMT = Periodic payment
i = Interest rate per period
n = Number of periods

Or

FVA n = PMT (FVIFA i, n)

Where:

(FVIFA i, n) = the future value interest factor for an annuity

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

Example 1:

Jitu Company has planned to acquire machinery after five years. To that end, the company deposits Birr 3,000.00 at the end of each year at a deposit rate of 12%. How much is the terminal (future value) of the deposits at the end of the fifth year?

Given: FVA n =? i = 12% n = 5; PMT = 3,000

FVA n = PMT (FVIFA i, n)

⇒ FVA 5 = 3,000 (FVIFA, 12 %, 5)

⇒ FVA 5= 3,000 (6.35284736)

⇒ FVA 5 = **Birr 19,058.54**

Example 2:

You need to accumulate Br. 250,000 to acquire a car. To do so, you plan to make equal monthly deposits for 5 years. The first payment is made a month from today, in a bank account which pays 12 percent interest, compounded monthly. How much should you deposit every month to reach your goal?

Given: FVA n = Br. 250,000; i = 12% ÷ 12 = 1%; n = 5 x 12 = 60 months; PMT =?

FVA n = PMT (FVIFA i, n)

⇒ Br. 250,000 = PMT (FVIFA, %, 60)

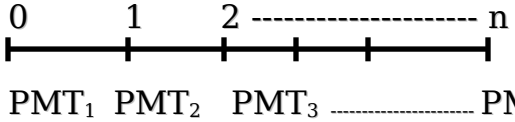
⇒ Br. 250,000 = PMT (81.670)

⇒ PMT = Br. 250,000/81.670

⇒ PMT = **Birr 3,061**

(ii) Future Value of an Annuity Due:

An annuity due is an annuity for which the payments occur at the beginning of each period. Therefore, the future value of an annuity due is computed exactly one period after the final payment is made. Graphically, this can be depicted as:



The future value of an annuity due is computed at point n where PMT n + 1 is made

FVA n (Annuity due) = PMT (FVIFA i, n) (1 + i)

Or

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

Example:

Assume example 1 for ordinary annuity except that the payments are made at the beginning instead of end of each year. How much is the terminal (future value) of the deposits at the end of the fifth year?

FVA n (Annuity due) = PMT (FVIFA i, n) (1 + i)

⇒ FVA 5 = 3,000 (FVIFA 12%, 5) (1 + 12%)

⇒ FVA 5 = 3,000 (6.35284736) (1.12)

⇒ FVA 5 = **Birr 21, 345.57**

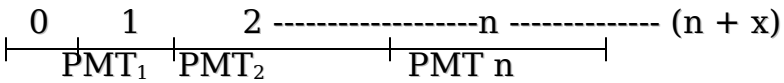
Comparing Future Values

For the same number of periods, same discount rate, and same amount of money involved; which one, ordinary annuity or annuity due, always will have greater future value?

Key: ***Annuity due will always have greater future value as the last cash flow earns interest for annuity due; but not for ordinary annuity.***

(iii) Future Value of Deferred Annuity:

Deferred annuity is an annuity for which the amount is computed two or more period after the final payment is made. When the amount of an ordinary annuity remains on deposit for a number of periods beyond the final rent, the arrangement is known as a deferred annuity. When the amount of an ordinary annuity continues to earn interest for one additional period, we have an annuity due situation, when the amount of an ordinary annuity continues to earn interest for more than one additional period, we have a deferred annuity situation.



The future value of a deferred annuity is computed at point n + x

FVA n (Deferred annuity) = PMT (FVIFA i, n) $(1 + \text{i})^{\text{x}}$

$$= \text{PMT}\left[\frac{(1+i)^n - 1}{i}\right](1 + \text{i})^{\text{x}}$$

Where x = the number of periods after the final payment; and x ≥ 2.

Example: Ebise has a savings account in which she had been depositing Br. 3,000 every year on January 1, starting in 1999. Her account earns 10% interest compounded annually. The last deposit Ebise made was on January 1,

2008. How much money will she have on December 31, 2012? (No deposits were made after January1, 2008).
January 1:

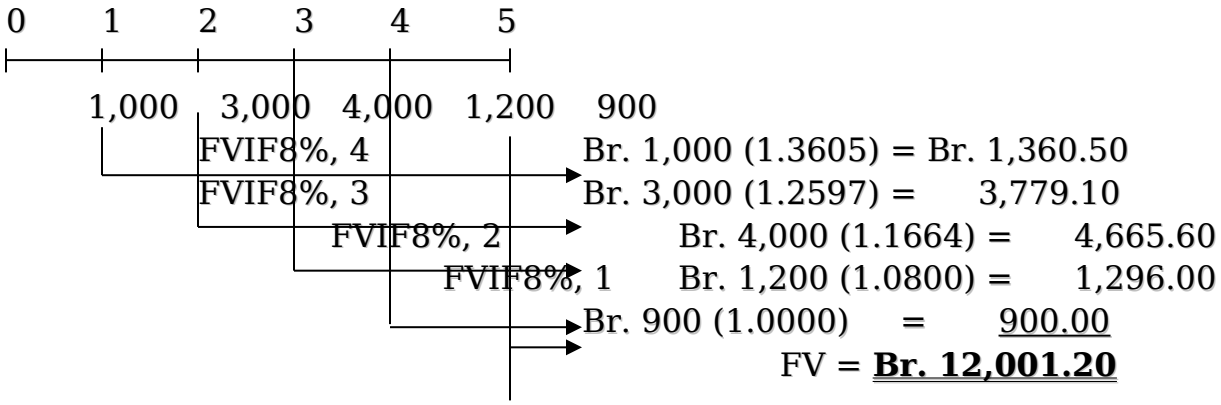
1999	2000	2001	02	03	04	05	06	07	08	09	2010	11	12
3,000	3,000	3,000	3,000	3,000	3,000	3,000	3,000	3,000	3,000				

The future value is computed on December 31, 2012 (or January 1, 2013).
Given: PMT = Br. 3,000; i = 10%; n = 10; x = 5

FVA n (Deferred annuity) = PMT (FVIFA i, n) (1 + i)x
= Br. 3,000 (FVIFA 10%, 10) (1.10)5
= Br. 3,000 (15.937) (1.6105)
= **Br. 76, 999.62**

C. Future Value of Uneven Cash Flows

Uneven cash flow stream is a series of cash flows in which the amount varies from one period to another. The future value of an uneven cash flow stream is computed by summing up the future value of each payment.
Example: Find the future value of Br. 1,000, Br. 3,000, Br. 4,000, Br. 1,200, and Br. 900 deposited at the end of every year starting year 1 through year 5. The appropriate interest rate is 8% compounded annually. Assume the future value is computed at the end of year 5.



1.3 Present Value of Money

Present value is the exact reversal of future value. It is the value today of a single cash flow, an annuity or uneven cash flows. In other words, a present value is the amount of money that should be invested today at a given interest rate over a specified period so that we can have the future value. The process of computing the present value is called discounting.

A. Present Value of a Single Amount

It is the amount that should be invested now at a given interest rate in order to equal the future value of a single amount.

$$PV = \frac{FVn}{(1+i)^n} = FVn\left(\frac{1}{1+i}\right)^n$$

Where:

PV = Present Value

FVn = Future value at the end of n periods

i = Interest rate per period

n = Number of periods

Or

PV = FVn (PVIF i, n)

Where:

(PVIF i, n) = The present value interest factor for i and n = $1/(1+i)^n$

Example:

Bonsa Company owes Br. 50,000 to Adugna Co. at the end of 5 years. Adugna Co. could earn 12% on its money. How much should Adugna Co. accept from Bonsa Company as of today?

Given: FV5 = Br. 50,000; n = 5 years; i = 12%; PV =?

PV = FV5 (PVIF12%, 5)

= Br. 50,000 (0.5674) = **Br. 28,370**

B. Present Value of an Annuity

i) Present value of an Ordinary Annuity: is a single amount of money that should be invested now at a given interest rate in order to provide for an annuity for a certain number of future periods.

$$PVA\ n = PMT\left[\frac{1-\frac{1}{(1+i)^n}}{i}\right] = PMT\left[\frac{1-(1+i)^{-n}}{i}\right] = PMT\ (PVIFA\ i, n)$$

Where:

PVA n = the present value of an ordinary annuity

(PVIFA i, n) = the present value interest factor for an annuity

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

Example 1:

On January 1, 2008, Tutu Company has borrowed Birr 500,000 by issuing an 8% note compounded annually to one of its local banks, which is payable Br. 100,000 a year for five years starting on December 31, year 1.

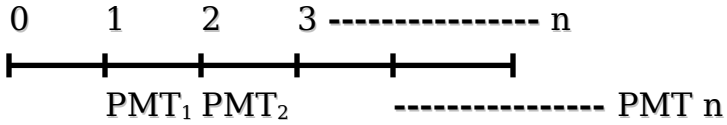
What is the present value of this debt on January 1, year 1? Prepare a loan amortization schedule.

***Solution*:** The present value of the debt on January 1, year 1, is equal to the present value of an ordinary annuity of five rents reported as Br. 399,271 (Br. 100,000 x 3.99271) in the accounting records on January 1, year 1.
The repayment program (loan amortization table) for this debt is summarized below:

Tutu Company
Repayment program for Debt of Br. 399,271 at 8% interest

Date	Debt balance	Interest Expense at 8% a year	Repayment at end of year	Net reduction in debt	
Jan. 1, year 1	Br. 399,271	-----	------	-----	
Dec. 31, year 1	331, 213	Br. 31,942	Br. 100,000		Br. 68,058
Dec. 31, year 2	257,710	26,497	100,000		73,503
Dec. 31, year 3	178,327	20,617	100,000		79,383
Dec. 31, year 4	92,593	14,266	100,000		83,734
Dec. 31, year 5	–0-	7,407	100,000		92,593

ii) Present Value of an Annuity Due: is the present value computed where exactly the first payment is to be made. Graphically, this is shown below:



The present value of an annuity due is computed at point 1 while the present value of an ordinary annuity is computed at point 0.

$$\text{PVA n = (Annuity due) = PMT} \left[\frac{1-(1+i)^{-n}}{i}\right](1+i) = \text{PMT (PVIFA i, n)}(1+i)$$

Example: Ruth Corporation bought a new machine and agreed to pay for it in equal installments of Br. 5,000 for 10years. The first payment is made on the date of purchase, and the prevailing interest rate that applies for the transaction is 8%. Compute the purchase price of the machinery.

Given: PMT = Br. 5,000; n = 10 years; i = 8%; PVA n (Annuity due) =?

PVA (Annuity due) = Br. 5,000 (PVIFA 8%, 10) (1.08)
= Br. 5,000 (6.7101) (1.08)
= **Br. 36,234.54**

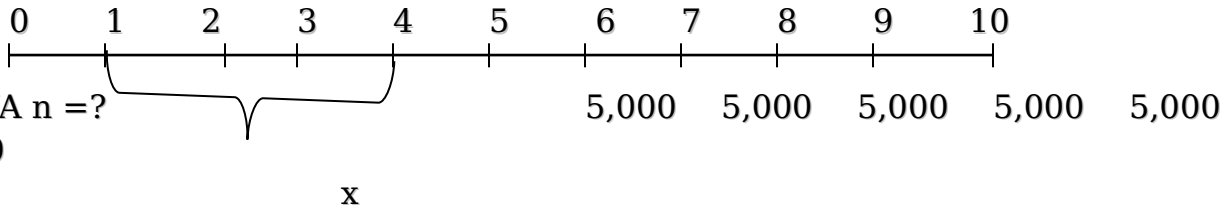
So the cost of the machinery for Ruth is Br. 36,234.54. We have identified the case as an annuity due rather than ordinary annuity because the first payment is made today, not after one period.

iii) Present value of a Deferred Annuity is computed two or more periods before the first payment is made.

PVA n (Deferred annuity) = PMT $\left[\frac{1-(1+i)^{-n}}{i}\right]$ $(1+i)^{-x}$ = PMT (PVIFA i, n) $(1+i)^{-x}$

Where x is the number of periods between the date when he first payment is made and the date the present value is computed.

Example:
Lali Chartered Accountants has developed and copyrighted an accounting software program. Lali agreed to sell the copyright to Steel Company for 6 annual payments of Br. 5,000 each. The payments are to begin 5 years from today. If the annual interest rate is 8%, what is the present value of the six payments?

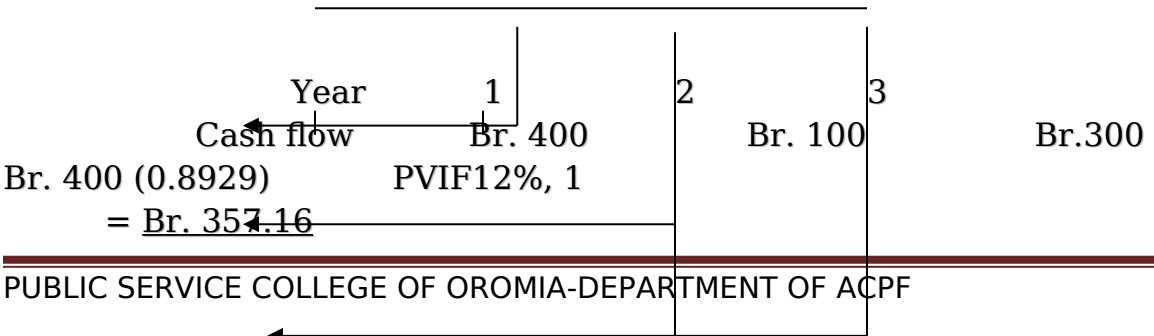


Given: n = 6; PMT = Br. 5,000; X = 4; PVA6 (Deferred annuity) =?
i = 8% PVA6 (Deferred annuity) = Br. 5,000 (PVIFA8%, 6) (1.08)-4
= Br. 5,000 (4.6229) (0.7350)
= **Br. 16,989.16**

C. Present Value of Uneven Cash Flows

The present value of an uneven cash flow stream is found by summing the present values of individual cash flows of the stream.

Example:
Suppose you are given the following cash flow stream where the appropriate interest rate is 12% compounded annually. What is the present value of the cash flows?



Br. 100 (0.7972) PVIF12%, 2
= Br. 79.72
Br. 300 (0.7118) PVIF12%, 3
= Br. 213.54
Br. 650.42

D. Present Value of Perpetuity

Perpetuity is an annuity with indefinite cash flows. In perpetuity payments are made continuously forever. The present value of perpetuity is found by using the following formula:

$$\text{PV (Perpetuity)} = \left[\frac{Payment}{Interest}\right] = \frac{PMT}{i}$$

Example:

What is the present value of perpetuity of Br. 7,000 per year if the appropriate discount rate is 7%?

Given: PMT = Br. 7,000; i = 7%; PV (Perpetuity) =?

$$\text{PV (Perpetuity)} = \left[\frac{Payment}{Interest}\right] = \frac{PMT}{i} = = \frac{Birr 7{,}000}{7\%}$$

= **Br. 100,000**.

This means that receiving Br. 7,000 every year forever is equal to receiving Br. 100,000 now, given that the market discount rate is 7%.

CHAPTER 4:
LONG-TERM INVESTMENT DECISION MAKING/CAPITAL BUDGETING

4.1 Introduction to Capital Budgeting

The word Capital refers to be the total investment of a company or firm in money, tangible and intangible assets whereas budgeting is the art of building budgets. Budgets are a blue print of a plan and action expressed in quantities and manners. The investment decisions of a firm are generally known as capital budgeting or capital expenditure decisions

Ideally, businesses should pursue all projects and opportunities that enhance shareholder value. However, because the amount of capital available at any given time for new projects is limited, management needs to use capital budgeting techniques to determine which projects will yield the most return over an applicable period of time.

The examples of capital expenditure:

1. Purchase of fixed assets such as land and building, plant and machinery, good will, etc.
2. The expenditure relating to addition, expansion, improvement and alteration to the fixed assets.
3. The replacement of fixed assets.
4. Research and development project

Definition of Capital Budgeting

Capital budgeting decision can be defined as follows:

- Capital budgeting is concerned with allocation of the firm's scarce financial resources in long term projects, the benefits occur over a future period.
- Capital budgeting may be defined as the firm's decision to invest current funds in long term assets to get the benefits over the years.
- Capital budgeting is the process of making investment decisions in capital expenditures
- Capital budgeting is a long-term planning for making and financing proposed capital out lays
- Capital budgeting is concerned with the allocation of the firm's financial resources among the available opportunities.
- Capital budgeting is acquiring inputs with long-term return
- Capital budgeting consists in planning development of available capital for the purpose of maximizing the long-term profitability of the concern

Characteristics of capital budgeting decisions are:

- Change of current assets for future benefits
- Investment of funds in non-flexible and long term assets or activities
- Huge funds are involved
- Future benefits of cash flows occur over a series of years
- Decisions are irreversible
- Significant impact on the profitability of the firm

A capital investment project can be distinguished from current expenditures by two features:

a. Capital investment projects are relatively large;
b. A significant period of time elapses b/n the investment outlay and the receipt of the benefits.

A systematic approach to capital budgeting implies:

a. The formulation of long-term goals;
b. The creative search for and identification of new investment opportunities;
c. Classification of projects and recognition of dependent proposals;
d. The estimation and forecasting of current and future cash flows;
e. A framework capable of transferring the required information to the decision level;
f. The controlling of expenditures and careful monitoring of crucial aspects of project execution;
g. A set of decision rules which can differentiate acceptable from unacceptable alternatives

Capital budgeting is a complex process as it involves decisions relating to investment of current funds for the benefit to be achieved in the future; where the future is uncertain.

Need and Importance of Capital Budgeting Decisions

Capital budgeting decision is an important function because of the following reasons:

1. **Huge investments**: Capital budgeting requires huge investments of funds, but the available funds are limited, therefore the firm before investing projects, plan are control its capital expenditure
2. **Long-term:** Capital expenditure is long-term in nature or permanent in nature.
   Therefore financial risks involved in the investment decision are more. If higher risks are involved, it needs careful planning of capital budgeting
3. **Irreversible:** The capital investment decisions are irreversible, are not changed back. Once the decision is taken for purchasing a permanent asset, it is very difficult to dispose off those assets without involving huge losses
4. **Long-term effect:** Capital budgeting not only reduces the cost but also increases the revenue in long-term and will bring significant changes in the profit of the company by avoiding over or more investment or under investment. Over investments leads to be unable to utilize assets or over utilization of fixed assets
5. **Risk:** Long term commitment of funds changes the risk profile of the firm. Adoption of a profitable investment increases the earning per share but cause a change in the earning pattern. As future is uncertain, there is no guarantee for the continuation of the same earnings, positively. Thus, investment decisions shape the basic character of the firm.
6. **Strategic Direction**: Finally, a firm's capital budgeting decisions includes its strategic direction since its entrance into new products, services, or markets must be preceded by capital expenditures.

Capital budgeting ensures that the proposed investment will add value to the firm. Effective capital budgeting can improve both the timing of asset acquisitions and the quality of assets purchased.

Therefore, before making the investment, it is required carefully planning and analysis of the project thoroughly.

CAPITAL BUDGETING PROCESS

Capital budgeting is a difficult process to the investment of available funds. The benefit will attained only in the near future but, the future is uncertain.

However, the following steps followed for capital budgeting, then the process may be easier are

- Identification of Various Investments Proposals
- Screening or Matching the Available Resources
- Evaluation of Proposals
- Fixing Property
- Final Approval
- Implementation

1. Identification of various investments proposals:

The capital budgeting may have various investment proposals. The proposal for the investment opportunities may be defined from the top management or may be even from the lower rank.

The heads of various departments analyze the various investment decisions, and will select proposals submitted to the planning committee of competent authority.

2. Screening or matching the proposals:

The planning committee will analyze the various proposals and screenings. The selected proposals are considered with the available resources of the concern. Here resources referred as the financial part of the proposal. This reduces the gap between the resources and the investment cost.

3. Evaluation:

After screening, the proposals are evaluated with the help of various methods, such as payback period proposal, net discounted present value method, accounting rate of return and risk analysis. The proposals are evaluated by.

- Independent proposals
- Contingent of dependent proposals
- Partially exclusive proposals.

4. Fixing property:

After the evolution, the planning committee will predict which proposals will give more profit or economic consideration. If the projects or proposals are not suitable for the concern's financial condition, the projects are rejected without considering other nature of the proposals.

5. Final approval:

The planning committee approves the final proposals, with the help of the following:

- Profitability
- Economic constituents

- Financial violability
- Market conditions.

The planning committee prepares the cost estimation and submits to the management.

6. Implementing:

The competent authority spends the money and implements the proposals. While implementing the proposals, assign responsibilities to the proposals, assign responsibilities for completing it, within the time allotted and reduce the cost for this purpose. The network techniques used such as PERT and CPM.

7. Performance review of feedback:

The final stage of capital budgeting is actual results compared with the standard results. The adverse or unfavorable results identified and removing the various difficulties of the project. This is helpful for the future of the proposals

Assumptions of Capital Budgeting

The set of conditions within which the financial aspects of long-term investments can be evaluated:

(i) Shareholder Wealth Maximization is the Basic Motive:

All capital-budgeting investment alternatives considered here are accepted or rejected on the basis of their effect on shareholder wealth. No other corporate goals influence the investment selection decision.

(ii) Costs and Revenues are Known With Certainty:

The costs and revenues associated with each investment alternative are known with certainty, or there exists a forecasting technique that can generate the values with a very small error. It may be very difficult to estimate revenues and costs more than two or three years into the future. However, if a proposed investment has a ten-year economic life, accurate forecasts must be available for all the ten years.

(iii) Inflows and Outflows are Based on Cash:

The data required for evaluating investment proposals must be stated in cash as opposed to accounting income. This is because a corporation uses cash to pay its bills and to pay cash dividends on common and preferred stock. If the corporation does not generate cash returns from its investments, it will sooner or later become insolvent.

(iv) Inflows and Outflows Occur Once a Year:

Cash inflows or outflows occur only once a year-either at the end of a given year or at discrete yearly intervals. Compounding and/or discounting occur only once a year. Investment alternatives are assumed to exhibit conventional cash flows

(v) The Required Rate of Return is Known and Constant:

From the perspective of the investor, the cost of capital is the *required rate of return* (RRR), the return that suppliers of capital demand on their investment (adjusted for tax deductibility of interest).

The minimum required rate of return on investment alternatives is assumed to be known with certainty and constant over the life of the proposed investment

alternatives. Having an appropriate required rate of return is important for two reasons

a. If the rate is set too high, the corporation will reject quite profitable projects and
b. If the rate is set too low, the corporation will accept projects that decrease shareholder wealth.

4.2 Estimating Net Cash Flows of an Investment Project

One of the most important steps in capital budgeting is estimating future cash flows for an investment project. The final results you obtain from capital budgeting analysis are no better than the accuracy of cash flow estimates. Since cash, not accounting net income is central to all decisions of the firm, you express whatever benefits you expect from a project in terms of ***cash flows*** rather than ***income flows***. This is because it is cash flows that directly affect the firm's ability to pay for bills, dividends to shareholders and purchase assets. Furthermore, accounting net income and net cash flow are not necessarily the same. This is due to the presence of certain non-cash expenses such as depreciation and amortization in the firm's income statement. and all revenues in the income statement may not represent cash inflows.

The cash flows of any project having the conventional pattern can include three basic components:

- ***Net Initial Investment,***
- ***Cash Flows from Operations,*** **and**
- ***Terminal Cash Flows.***

(I) Net Initial Investment

- The term net initial investment, as used here, refers to the relevant cash outflows to be considered when evaluating a prospective capital expenditure.
- The net initial investment occurs at time zero—the time at which the expenditure is made.
- The net initial investment is calculated by subtracting all cash inflows occurring at time zero from all cash outflows occurring at time zero.

Table 4.1: Basic Format for Determining Net Initial Investment

Project cost or cost of new fixed assets	xxxx
Add: Cost of installation, insurance, transport	xxxx
Add: Net working capital	xxxx
De Deduct: Cash inflows from the proceeds of disposal of old fixed assets	xxxx
Add (Deduct): Taxes (tax savings) on disposal of old assets	xxxx
Net Initial investment (or net initial cash outflows)	**xxxx**

Project cost is the outlay (expenditure) required to acquire or begin the implementation of an investment proposal. It comprises, primarily:

- Cost of new assets, purchase land, building, and machinery, etc.

- Costs of insuring, transporting and/or installing machinery and related equipment
- Increased investment in working capital,

If the project requires a commitment of net working capital, net initial investment will be increased by the same amount. But if the change in net working capital were negative, it would be taken as an initial cash inflow in determining the net initial investment associated with the project.

Example 1: Assume that Kena Corporation wants to introduce new production machinery. The cost of the machinery is Br. 10,000,000. The machinery is expected to last for ten years, after which time it will have a scrap value of Br. 80,000. The corporation spends Br. 190,000 in transporting the machinery from the manufacturer and in installing the machinery in its plant. The corporation pays for the machinery by making a down payment of Br. 1,000,000 and finances the remainder with a bank loan.
What will be the net initial investment for the new production machinery?

Solution:

Cost of new machinery	10,000,000
Add: Cost of installation, & transport	190,000
Net Initial investment (or net initial cash outflows)	**10,190,000**

Note that the scrap value of the new machinery and financing arrangements are not included in this computation.
In the case of replacement decisions, the existing fixed assets may be sold if the new fixed assets are to be purchased. The sales proceeds of these assets should, therefore, be deducted from the project cost while determining the amount of the net initial investment. An investment proposal sometimes involves replacing an existing fixed asset with a new asset. The existing fixed asset may have a market value or scrap value. It may or may not have been fully depreciated. Any combination of these items can produce an increase or decrease in the income tax liability of the company. The tax impacts of disposing the existing fixed asset are included in computing the net initial investment of the project.
In this chapter, companies are assumed to pay an ordinary income tax rate of 30 percent and a capital gains tax rate of 25 percent.
The rules that determine the tax impact of selling a depreciable asset are:

1. If an asset is sold for less than its book value, the company realizes a decrease in its tax liability equal to 30 percent of the difference between the selling price and the book value.
2. If the asset is sold for its book value, there is no impact of corporate taxes.

3. If the asset is sold for more than its book value but for an amount equal to or less than it's original cost, the corporation incurs an increase in its tax liability equal to 30 percent of the difference between the selling price and the book value of the asset.
4. If the asset is sold for more than its original cost, the corporation incurs an increase in its tax liability equal to the tax on the capital gain plus the tax on the recaptured depreciation. The capital gains tax is 25 percent of the difference between the selling price and the original cost. The tax on the recaptured depreciation is 30 percent of the difference between the original cost and the book value.

Taking the above rules into account, the computation of a project's net initial investment is demonstrated below.

Example 2: Assume that new machinery is purchased to replace outdated machinery by Kena Corporation. The new machinery costs the corporation Br.2, 500,000, including installation costs and has an expected salvage value of Br. 250,000 after ten years. The cost of the existing machinery originally was Br. 800,000 and it has a current book value of Br. 100,000. Based on the following independent assumptions with regard to the disposal value of the old machinery, compute the net initial investment of the project.

Solution

1. Assume that the existing machinery is sold for Br. 10,000.
   The corporation realizes a tax savings of .30*(Br. 100,000 - Br. 10,000) =Br. 27,000.
   The net initial investment of the project is:
   Project and installation costs……Br. 2,500,000
   Less: Proceeds from disposal of old machinery…… 10,000
   Tax savings on asset disposal…… 27,000
   (37,000)
   Net Initial Investment…… Br. 2,463,000

2. Assume that the existing asset is sold at its book value. (There is no tax impact on this sale.)
   The net initial investment of the project is:
   Project and installation costs…… Br. 2,500,000
   Less: Proceeds from old machinery disposal …… 100,000
   Net Initial Investment …… Br.2, 400,000

3. Assume that the existing asset is sold for Br. 150,000.
   The corporation incurs an increase in its tax liability of .30(Br. 150,000–Br. 100,000) =Br. 15,000.
   The net initial investment of the project is:
   Project and installation costs……Br. 2,500,000
   Less: Proceeds from old machinery disposal…… 150,000
   Add: Tax on recapture of depreciation…… 15,000…….. (135,000)
   Net Initial Investment……Br. 2,365,000

4. Assume that the existing asset is sold for Br. 1,000,000.
   The corporation incurs an increase in its tax liability of .25(Br. 1,000,000 – Br. 800,000) + .30(Br. 800,000- Br. 100,000) = Br. 260,000.
   The net initial investment of the project is:
   Project and installation costs:…… Br. 2,500,000
   Less: Proceeds from asset disposal…… 1,000,000
   Add: Effect of Taxes…… 260,000…….. (740,000)
   Net Initial Investment……Br. 1,760,000

(II) Net Cash Flows from Operations

The second part of the cash flow stream, operating cash flows, is the net cash flows that occur while the asset is in operation. They begin in year 1 and continue throughout the project's useful life. Operating cash flows are calculated by taking the difference in the cash inflows and the cash outflows to provide the cash flow before tax attributable to the proposed project. The cash flows should therefore be estimated on an after-tax basis.

While it may not be possible to obtain exact cash measurements, it is possible to generate useful approximations by using accounting data. The yearly returns from any project are assumed to be estimates of the project's profit before depreciation and taxes. Cash flow from operations is, computed as shown in table 4.2.

Table 4.2: Basic Format of Determining Net Cash Flow from Operations

Profit before depreciation and taxes	xxxxxx
Deduct: Depreciation	xxxxxx
Deduct: Taxes	xxxxxx
Add: Depreciation and any other non-cash expenses	xxxxxx
Net Cash Flow From Operations	xxxxxx

Net annual cash flow from operations can be equivalently defined as profit after taxes plus depreciation and other non-cash expenses. In this material, we assume the only non-cash expense is depreciation. Since depreciation is a non-cash expense, it creates a tax shield and lowers a corporation's tax liability. However, a project's yearly value of profit after taxes understates its net cash flow by the amount of the depreciation expense. Thus, depreciation is added back to the profit after taxes. In computing the cash flow of an investment project in this unit, straight-line depreciation is used and the corporate tax rate on profit before tax is assumed to be 40 percent.

Example: Assume that a project's net investment is Br. 6,000,000 of which Br. 5,000,000 is a depreciable amount. The investment has a ten-year economic life. Profit before depreciation and tax is estimated at Br. 1,750,000 per year. What will the project's net cash flow be from operations?

Solution

Annual depreciation is Br. 5,000,000/5 = Br. 1,000,000. The yearly net cash flows from operations are obtained as follows:

Profit before depreciation and taxes.....Br. 1,750,000
Less: Depreciation..... 1,000,000
Taxable profit..... ... Br. 750,000
Less: Income taxes (30%)..... 225,000
Profit after taxes..... Br. 525,000
Add: Depreciation..... .. 1,000,000
Net cash inflows from operations..... Br. 1,525,000

(III) Terminal Cash Flows

Terminal Cash flows are the net after-tax cash flows other than the operating cash flows that occur in the last year of the project's life. These potential project windup cash flows are:

1. The salvage value of any sold or disposable assets;
2. Taxes (tax savings) related to the asset sale or disposal; and
3. Any project-termination related change in working capital.

Table 4.3: Basic Format of Determining Terminal Cash Flow

Proceeds from sale of old assets of the project at the final year	xxxx
Deduct: Taxes due to sale or disposal of the old assets	xxxx
Add: Recovery of net working capital invested in the initial year of the project	xxxx
Terminal cash flow	xxxx

I. **Proceeds from the Sale of the Old Assets:** The proceeds from the sale of old assets of the project are often called salvage value. The salvage value

represents the amount of sale net of any removal costs expected upon termination of the project.

II. **Taxes on Sale of the Old Assets**: Like the tax calculation on sale of old assets demonstrated as part of finding the net initial investment, taxes must be considered on the terminal sale of the old assets of the project. The tax calculations apply whenever an asset is sold for a value different from its book value. If the proceeds from the sale are expected to exceed book value, a tax payment will be shown as cash outflow. When the proceeds from the sale of old assets are below book value, a tax savings on asset disposal will be shown as a cash inflow. Of course, when assets are sold at their book value, no taxes would be due.

III. **Recovery of Net working Capital**: In addition to the salvage value of the asset, the firm may also recover the increased net working capital that was tied up in the initial year of the project. Most often this will show up as a cash inflow attributed to the reduction in net working capital. With termination of the project, the need for the increased net working capital investment is assumed to end. Because the net working capital investment is in no way consumed, the amount recovered at the termination will equal the amount shown in the calculation of the initial net investment.

Example: Assume that Kachisa Corporation purchases several new metal-cutting machines. The relevant data regarding this purchase are listed below:

Purchase price.....	Br. 10,000,000
Transportation and installation costs.....	Br. 64,000
Economic lifetime.....	20 years
Estimated salvage value.....	Br. 400,000
Yearly profit before depreciation & taxes.....	Br. 1,000,000
Net working capital needed to operate the new machines...	Br. 100,000

Based on the above data you can compute the three types of cash flows:

(a) The ***Net Initial Investment*** of the project is computed as follows:

Purchase cost.....	Br. 10,000,000
Add: Transportation and installation cost.....	64,000
Net increase in working capital	100,000
Net Initial Investment.....	**Br. 10, 164,000**

(b) The ***Yearly Net Cash Flows from Operations*** is computed as follows:

Profit before depreciation and taxes.....	Br. 1,000,000
Less: Depreciation®.....	483,200
Taxable profit.....	516,800
Less: Income taxes (30%).....	155,040
Profit after taxes.....	Br. 361,760
Add: Depreciation.....	483,200
Net Cash Inflows from Operations.....	**Br. 844,960**

®→The Depreciable Amount of the machines is:
Net cost of machines……Br. 10,064,000
Less: Salvage value…… 400,000
Depreciable Amount…… Br. 9,664,000
→Yearly Depreciation =Br. 9,664,000/20years = Br. 483,200

(c) The ***Terminal Net Cash Flow*** is computed as follows:
Salvage value or proceeds from sale of the new metal-cutting machines… Br. 400,000
Add: Recovery of net working capital…… 100,000
Net Terminal Cash Inflows…… Br. 500,000

The net cash flow from operations is Br. 844,960 in each of the twenty years. In year 20, the estimated salvage value which is Br. 400,000 and the recovery of net working capital (Br. 100,000) will increase the total net cash flows from the project.

The project's terminal net cash inflows would be Br. 400,000 + Br. 100,000 = Br. 500,000. Thus, the year 20 total net cash inflows will be Br. 844,960+ Br. 500,000 = Br. 1,344,960. When the investment is terminated, at the end of year 20, the net working capital is presumed to be recovered. The recovery of net working capital is treated as an addition to the firm's cash inflows.

Types of Capital Projects

Capital projects usually are classified into the following types:

(a) Replacement Projects:

A decision concerning whether an existing machine should be replaced by a newer version of the same machine or even a different type of machine that does the same thing as the existing machine is one type of capital projects. Such replacements are generally made to maintain existing levels of operations, although profitability might change due to changes in expenses (that is, the new machine might either be more expensive or cheaper to operate than the existing machine).

(b) Expansion Projects:

A decision concerning whether the firm should increase operations by adding new products, additional machines, and so forth is taken as an expansion project. Such decisions would expand operations beyond the existing scope.

(c) Independent Projects:

Independent (sometimes called stand-alone) projects are any set of projects in which choosing one has no impact on our decision to choose another project from that set. For example, Boja Burger Inc. may have the following capital budgeting projects to consider. The first is a new deep-frying system for their French fries. The second is a new order placement system for the drive-thru. Boja Burger could choose to take the new deep fryer or the new order placement, or it could choose both. Taking one project does not influence the other, so they are independent.

(d) Mutually Exclusive Projects:
Mutually exclusive projects are any set of projects in which choosing one makes the other projects no longer possible. For example, we are considering upgrading our printing press and have two alternatives. The first is a low-cost model that will need to be replaced in 3-years and the second is a more expensive model that will need to be replaced in 5-years. We can only choose one of these options, so they are mutually exclusive.

In practice, many decisions made by a firm are neither independent nor mutually exclusive, but are instead ***interdependent.*** In this case, the decision to take one project impacts our decision to take another, but they are not mutually exclusive. For example, Videogames may decide to introduce a new video game machine along with some game cartridges for the system. The two projects are not independent (the game machine will sell better with more game cartridges available) nor mutually exclusive (producing the cartridges does not preclude producing the game machine). However, they are interdependent in that each project will perform better if both are produced.

4.3 Investment Analysis

Capital budgeting is a many-sided activity. There are several sequential stages in the process. For typical investment proposals of a large organization, the distinctive stages in the capital budgeting process are depicted, in the form of a highly simplified flow chart, in Figure 4.1.below. The milestones in the capital budgeting process can be explained briefly as follows:

(1) Strategic Planning: A strategic plan is the grand design of the firm and it clearly identifies the business the firm is in and where it intends to position itself in the future. Strategic planning translates the firm's corporate goal into specific policies and directions, sets priorities, specifies the structural, strategic and tactical areas of business development, and guides the planning process in the pursuit of solid objectives. A firm's vision and mission is summarized in its strategic planning framework.
There are feedback loops at different stages and the feedback to 'strategic planning' at the project evaluation and decision stages indicated by upward arrows in Figure 4.1 are critically important. These feedbacks may suggest changes to the future direction of the firm which may cause changes to the firm's strategic plan.

(2) Identification of Investment Opportunities: The identification of investment opportunities and generation of investment project proposals is an important step in the capital budgeting process. Project proposals cannot be generated in isolation. They have to fit in with a firm's corporate goals, its vision, mission and long-term strategic plan. Of course, if an excellent investment opportunity presents itself, the corporate vision and strategy may

be changed to accommodate it. Thus, there is a two-way traffic between strategic planning and investment opportunities.

Some investments are ***mandatory;*** for instance, those investments required to meet particular regulatory, health, and safety requirements are essential for the firm to remain in business. Other investments are ***discretionary*** and are generated by growth opportunities, competition, cost reduction opportunities, and so on. These investments normally represent the strategic plan of the business firm and, in turn, can set new directions for the firm's strategic plan.

(3) Preliminary Screening of Projects: Generally, there will be many potential investment proposals generated by a firm, which cannot all go through the rigorous project analysis process. Therefore, the identified investment opportunities have to be subjected to a preliminary screening process by management to isolate the unsound proposals, because it is not worth spending resources to thoroughly evaluate such proposals. The preliminary screening may involve some preliminary quantitative analysis and judgments based on intuitive feelings and experience.

(4) Financial Appraisal of Projects: Projects which pass the preliminary screening test become candidates for rigorous financial appraisal to determine if they would add value to the firm. The analysis at this stage is also called **quantitative analysis**, **economic and financial appraisal**, **project evaluation**, or simply **project analysis**. This analysis may:

- Predict the expected future cash flows of the project,
- Analyze the risk associated with those cash flows,
- Develop alternative cash flow forecasts,
- Examine the sensitivity of the results to possible changes in the predicted cash flows.

Thus, the project analysis can involve the application of forecasting techniques, project evaluation techniques, risk analysis and mathematical programming techniques such as linear programming.

While the basic concepts, principles, and techniques of project evaluation are the same for different projects, their application to particular types of projects requires special knowledge and expertise. For instance, asset expansion projects, asset replacement projects, and property investments have their own special features and peculiarities.

Financial appraisal will provide the estimated addition to the firm's value in terms of the projects' net present values. If the projects identified within the current strategic framework of the firm repeatedly produce negative net present values in the analysis stage, these results send a message to the management to review their strategic plan. Thus, the feedback from project analysis to strategic planning plays an important role in the overall capital budgeting process. The results of the quantitative analyses heavily influence

the project selection or investment decisions. These decisions clearly affect the success or failure of the firm and its future direction.

(5) Qualitative Factors in Project Evaluation: When a project passes the quantitative analysis test, it has to be further evaluated taking into consideration qualitative factors. Qualitative factors are those which will have an impact on the project, but which are virtually impossible to evaluate accurately in monetary terms.

Qualitative factors include:

- The societal impact of an increase or decrease in number of employees;
- The environmental impact of the project;
- Possible governmental political attitudes towards the project;
- The strategic consequences of consumption of scarce raw materials;
- Possible legal difficulties with respect to the use of patents, copyrights, and brand names;
- Impact on the firm's image if the project is socially questionable.

(6) The Accept/Reject Decision: The results of the six project evaluation techniques from the quantitative analysis (to be discussed later in this chapter) combined with qualitative factors form the basis of the decision support information. The analyst relays this information to management with appropriate recommendations. Management considers this information and other relevant prior knowledge using their routine information sources, experience, expertise and, of course, judgment to make a major decision—to accept or reject the proposed investment project.

Steps in the Evaluation of Potential Capital Projects

Once a potential specific capital budgeting project has been identified, its evaluation involves the following steps:

(i) First, the cost of the project must be determined.

(ii) Next, management estimates the expected cash flows from the project, including the salvage value of the asset at the end of its expected life.

(iii) Third, the riskiness of the projected cash flows must be estimated. This requires information about the probability distribution (uncertainty) of the cash flows.

(iv) Given the project's riskiness, management determines the cost of capital at which the cash flows should be discounted.

(v) Next, the expected cash flows are put on a present value basis to obtain an estimate of the asset's value to the firm.

(vi) Finally, the present value of the expected cash inflows is compared with the required outlay, or cost. If the Present Value of the cash flows exceeds the cost, the project should be accepted. Otherwise, it should be rejected.

(Alternatively, if the expected rate of return on the project exceeds its cost of capital, the project is accepted.)

(7) Project Implementation and Monitoring: Once investment projects have passed the decision test, they then must be implemented by management. During this implementation phase various divisions of the firm are likely to be involved. An integral part of project implementation is the constant monitoring of project progress with a view to identifying potential bottlenecks thus allowing early intervention. Deviations from the estimated cash flows need to be monitored on a regular basis with a view to taking corrective actions when needed.

(8) Post-implementation Audit: Post-implementation audit does not relate to the current decision support process of the project; it deals with an investigation of the performance of already implemented projects. An evaluation of the performance of past decisions, however, can contribute greatly to the improvement of current investment decision-making by analyzing the past 'rights' and 'wrongs'.
The post-implementation audit can provide useful feedback to project appraisal or strategy formulation. For example, *ex post* assessment of the strengths (or accuracies) and weaknesses (or inaccuracies) of cash flow forecasting of past projects can indicate the level of confidence (or otherwise) that can be attached to cash flow forecasting of current investment projects. If projects undertaken in the past within the framework of the firm's current strategic plan do not prove to be as rewarding as predicted, such information can prompt management to consider a thorough review of the firm's current strategic plan.

Once we determine the relevant cash flows information necessary to make capital budgeting decisions, we need to evaluate the attractiveness of the various investment proposals under consideration. The investment decision will be to either accept or reject each proposal. Five key methods are used to rank the projects and to decide whether or not they should be accepted for inclusion in the capital budget. However, before we go on to discuss these five methods, it worthwhile having criteria for ideal project evaluation methods. A project evaluation method is considered ideal if it:

1. Includes all cash flows that occur during the life of the project;
2. Considers the time value of money;
3. Incorporates the required rate of return on the project;
4. Considers the riskiness of cash flows; and
5. Always ranks projects so that those projects that add the most to the value of the firm are ranked highest.

4.4 Investment Analysis Tools

There are various criteria for evaluating and selecting financially viable or feasible investment projects. These include:

1. Payback Period
2. The Accounting Rate of Return
3. Discounted Payback Period
4. Net Present Value
5. Profitability Index
6. Internal Rate of Return
7. Modified Internal Rate of Return

I. The Payback Period

The payback period in capital budgeting refers to the period of time required for the return on an investment to "repay" the sum of the original investment. The time value of money is not taken into account in this method. Payback period intuitively measures how long something takes to "pay for itself." All else being equal, ***shorter payback periods are preferable to longer payback periods***. Payback period is widely used because of its ease of use despite the recognized limitations described below.

Payback period as a tool of analysis is often used because it is easy to apply and easy to understand for most individuals, regardless of academic training or field of endeavor. When used carefully or to compare similar investments, it can be quite useful. As a stand-alone tool to compare an investment to "doing nothing." Payback period has no explicit criteria for decision-making (except, perhaps, that the payback period should be less than infinity).

Computation of Payback period: When an investment's cash flows are uniform, payback period can be computed by dividing the project's net initial investment into the value of net annual cash inflow.

Example 1: **An investment has net initial investment and net annul cash inflows as shown in the following table:**

Year	Net Initial Investment	Yearly Cash Inflows
0	Br. 42,000	0
1		14,000
2		14,000
3		14,000
4		14,000
5		14,000

Payback period =

= = 3 years

When an investment's cash flows are not in annuity form, the cumulative cash flows are used in computing payback period.

Example 2: Compute the payback period for the following cash flows, assuming a net initial investment of Br. 40,000 associated with a certain investment project.

Year	Net Initial Investment	Yearly Cash Inflows	Cumulative Cash Inflows
0	Br. 40,000	0	0
1		10,000	10,000
2		14,000	24,000
3		9,000	33,000
4		7,000	40,000
5		11,000	51,000

The payback period for this project is four years because it will take the project exactly four years to recover the full net initial investment made.

A measurement problem with payback period arises when the cumulative cash inflows of any particular year does not exactly correspond a project's net initial investment. Look at the following example, where the cash flows do not take annuity form and the cumulative cash inflows of particular years do not exactly equal net initial investment outlay.

Example 3: Compute the payback for the following cash flows, assuming a net initial investment of Br. 42,000:

Year	Net Initial Investment	Yearly Cash Inflows	Cumulative Cash Inflows
0	Br. 42,000	0	0
1		10,000	10,000
2		14,000	24,000
3		9,000	33,000
4		7,000	40,000
5		11,000	51,000

In a situation like the one indicated in this example, the following steps can resolve the problem of computing payback period:

Step1: Accumulate the cash flows occurring after the initial outlay for the investment in "cumulative cash inflows" column.

Step2: Look at the "cumulative cash inflows" column and note the last year for which the cumulative total does not exceed the net initial investment. (In this example, that would be year 4 where the cumulative cash inflow is Br. 40,000.)

Step 3: Compute the fraction of the following year's cash inflow needed to recover the net initial investment as follows: Take the net initial investment minus the

cumulative total from step 2. Then divide this amount by the following year's cash inflow. (For this example, you have (Br. 42,000 - Br. 40,000)/Br 11,000 = 0.18 years = approximately 2 months.)

Step 4: To get the payback period in years, taking the whole figure determined in step 2 and add to it the fraction of a year determined in step 3. You may use the following formula:

$$Payback\ Period = Year\ before\ Recovery + \frac{Unrecovered\ Cash\ Inflow\ of\ the\ Recovery}{}$$

In this example, payback period = 4 years + = 4 years and 2 months.

The Decision Rule for Payback Period Criterion

1. If PBP > Target period** - Accept the proposal (project)
2. If PBP < Target period - Reject the proposal (project)
3. If PBP = Target period - Further analysis is required

(**Target period is the minimum period targeted by management to cover initial investment. It acts as benchmark for those involved in capital budgeting decision.)

For example, if the required payback period were 3 years in the above example, the project would be rejected because the payback period of the project (or 4.18 years) is greater than the maximum acceptable payback period (or 3 years).

Limitations of the Payback Period Criterion

The payback criterion measures the time required for a project to break even. However, this criterion in capital budgeting has the following limitations:

1. Ignore cash flow after payback period, hence, cannot measure of profitability
2. The maximum acceptable cutoff payback period is subjective decision
3. It ignores the time value of money
4. Finally, the rule is biased against long-term projects.
5. It is one of the misleading evaluations of capital budgeting

Advantages of the Payback Period Criterion

While being a poor criterion to measure profitability, the payback period gives a rough indication of the liquidity of a project. The payback period was among the first capital-budgeting criteria to be widely accepted. It continues to be in common use even today for the following reasons:

6 It is easy to calculate and simple to understand.

7 Pay-back method provides further improvement over the accounting rate return

8 Pay-back method reduces the possibility of loss on account of obsolescence

9 It favors projects that "pay back quickly" and contributes to the firm's overall liquidity.

10 Because it favors short-term investments, the rule is often employed

when future events are difficult to quantify.

The use of the payback period criterion can produce incorrect decisions when investment alternatives are being accepted or rejected on the basis of their time adjusted profitability. Consequently, a decision to use the payback criterion has to balance its simplicity of concept and procedure against its inability to judge profit and time values. Thus, even if the payback period has little support on theoretical grounds, it has strong support on practical grounds particularly for small businesses.

II. The Accounting Rate of Return-(ARR)

The ARR method (also called the return on capital employed (ROCE) or the return on investment (ROI) method) of appraising a capital project is to estimate the accounting rate of return that the project should yield. If it exceeds a target rate of return, the project will be undertaken.

$$ARR\ on\ Total\ Investment = \frac{Net\ Annual\ Profit}{Investment\ Outlay}\ or\ \left[Rt + \frac{(C - D)}{Io} \right]$$

Note that net annual profit excludes depreciation.

Example: A project has an initial outlay of Br. 1 million and generates net receipts of Br. 250,000 for 10 years.

Assuming straight-line depreciation of Br. 100,000 per year:

$$The\ ARR\ on\ Total\ Investment = \frac{Br.250{,}000 - Br.100{,}000}{Br.1{,}000{,}000} = 15\%$$

Decision rule

1. If ARR > Target rate** - Accept the proposal (project)
2. If ARR < Target rate - Reject the proposal (project)
3. If ARR = Target rate - Further analysis is required

(**Target rate is the minimum rate of return targeted by management. It acts as benchmark for those involved in capital budgeting decision.)

Advantages of the Accounting Rate of Return (ARR)

(i) It considers the total benefits associated with the project

(ii) It is easy to calculate and simple to understand.

(iii) It is based on accounting profit hence measures the profitability of investment.

Disadvantages of the Accounting Rate of Return (ARR)

1. It does not take account of the timing of the profits from an investment.
2. It implicitly assumes stable cash receipts over time.
3. Accounting profits are subject to a number of different accounting treatments.

4. Takes no account of the size of the investment.
5. It does not consider terminal value of the project.
6. It ignores the time value of money.
7. It ignores the reinvestment potential of a project

Note that the payback period and accounting rate of return methods are said to be traditional or non-discounted cash flow methods.

III. Discounted Payback Period

- The discounted payback period is the time needed to pay back the original investment in terms of discounted future cash flows.
- Each cash flow is discounted back to the beginning of the investment
- The discounted payback method is similar to the payback method **except** that all future cash inflows and outflows are discounted back to the present time.
- Projects with the shortest discounted payback are ranked highest.
- Has advantage over the simple payback method because it considers the time value of money.
- It addresses liquidity and cash flow issues.
- However, it doesn't consider the value of cash generated beyond the payback date.
- Use of arbitrary cutoff period

Example: A project costs Br. 110,000 in year 0. Cash inflows are:
Y1 = Br. 40,000,
Y2 = Br. 60,000,
Y3 = Br. 70,000,
Assume a discount rate of 10%.

Format for Computing Discounted Payback:

	Year 1	Year 2	Year 3
Discounting Inflows	Br. 40,000 / (1+10) =Br. 40,000/1.1	Br. 60,000 / $(1+10)^2$ =Br. 60,000/1.21	Br. 70,000 / $(1+10)^3$ =Br. 70,000/1.331
	=Br. 36,364	**Br. 49,587**	**Br. 52,592**

Outflows..... Br. 110,000
Less Discounted inflows of Y1..... 36,364
Discounting inflows of Y2..... 49,587
Residue (110,000-36,364-49,587)..... 24,049
Residue/inflow in year 3 = Br. 24,049/Br. 52,592 = 0.454
Discounted Payback period = 2 years + 0.454 = 2.454 years

Advantages:

(i) Considers the time value of money.

(ii) Considers the riskiness of the cash flows involved in the payback

Disadvantages

(i) No concrete decision criteria that tells us whether the investment increases the firm's value.

(ii) Calls for a cost of capital

(iii) Ignores cash flows beyond the payback period

IV. Net Present Value (NPV)

Net present value method is one of the modern methods for evaluating the project proposals. In this method cash inflows are considered with the time value of the money. Net present value describes as the summation of the present value of cash inflow and present value of cash outflow. Net present value is the difference between the total present value of future cash inflows and the total present value of future cash outflows

The formula for computation of NPV is given below:

$$NPV = \sum_{t=0}^{n} \frac{CF_t}{(1+k)^t} - Io$$

Where, $\mathbf{CF_t}$ is the expected net cash flow at period **t**,

K is the project's RRR or the firm's cost of capital,

$\mathbf{I_0}$ is initial outlay cost, and

n is the project's life.

Since NPV can be positive, zero, or negative, attention must be paid to its algebraic sign.

Advantages

1. It recognizes the time value of money.
2. It considers the total benefits arising out of the proposal.
3. It is the best method for the selection of mutually exclusive projects.
4. It helps to achieve the maximization of shareholders' wealth.

Disadvantages

1. It is difficult to understand and calculate.
2. It needs the discount factors for calculation of present values.
3. It is not suitable for the projects having different effective lives.
4. It may not give good results while comparing projects with unequal lives
5. It is not easy to determine an appropriate discount rate

Accept/Reject criteria (Decision rule)

1. If NPV > 0 - Accept the proposal (project)
2. If NPV < 0 - Reject the proposal (project)
3. If NPV = 0 - Further analysis is required

Example 1:
Assume that Best Boats is considering the purchase of Br. 150,000 worth equipment for its boat rentals. The equipment is expected to last seven years and has a Br. 5,000 salvage value at the end of its life. The annual cash inflows are expected to be Br. 250,000 and the annual cash outflows are estimated to be Br. 200,000. These data are summarized in the following table:

Cash Outflows		***Cash Inflows***	
Project Cost	Br. 150,000	Cash from Customers (1)	Br. 250,000
Operating Costs (2)	200,000	Salvage Value	5,000
Estimated Useful Life	7 years		
Minimum Required Rate of Return	12%		
		Net Annual Cash Flows (Br. 250,000 – Br. 200,000) or (1) - (2)	Br. 50,000
Present Value of Cash Flows			
Present value of Net Annual Cash Flows (Br. 50,000 × 4.5638)			Br. 228,190
Present value of Salvage Value (Br. 5,000 × .4523)			2,262
Total Present Value of Net Cash Inflows			Br. 230,452
Less: Investment Cost (already at present value)			(150,000)
Net Present Value (NPV)			Br. 80,452

Since the NPV of this project is positive or greater than zero; accepting this project is expected to increase shareholders' wealth. Thus, **the project is acceptable**.

Example 2: When net cash flows are not all the same, a separate present value calculation must be made for each period's cash flow. Assume the same project information for the Best Boat's investment except for net cash flows, which are summarized with their present value below.

Period	**Estimated Annual Net Cash Flow (1)**	**12% Discount Factor (2)**	**Present Value (1) × (2)**
1	Br. 44,000	.8929	Br. 39,288
2	55,000	.7972	43,846
3	60,000	.7118	42,708
4	57,000	.6355	36,224
5	51,000	.5674	28,937
6	44,000	.5066	22,290
7	39,000	.4523	17,640
Totals	Br. 350,000		Br. 230,933

The NPV of the project is Birr 83,195, calculated as follows:

Present Value of Cash Flows	
Net Annual Cash Flows	Br. 230,933
Salvage Value (Birr5,000 × .4523)	2,26
Total Present Value of Net Cash Inflows	233,195
Less: Investment Cost	(150,000)
Net Present Value	Br. 83,195

The difference between the NPV under the equal cash flows example (Br. 50,000 per year for seven years or Br. 350,000) and the unequal cash flows (Br.

350,000 spread unevenly over seven years) is the timing of the cash flows. **This project also is acceptable as its NPV is positive.**

V. Profitability Index (PI) or Benefit Cost Ratio

Profitability index method is the relationship between the present values of net cash inflows and the present value of cash outflows. It can be worked out either in unitary or in percentage terms. The formula is

$$\text{Profitability Index} = \frac{Present\ Value\ of\ Cash\ Inflow}{Initial\ Investment}$$

Accept/Reject criteria (Decision rule)

PI > 1	Accept
PI = 1	indifference
PI < 1	reject

Higher the profitability index more is the project preferred.

From the above example we can calculate the profitability index as below

Present value of cash outflows Br 100,000

Present value of cash inflows Br 118,730

$$\text{: - PI} = \frac{Br.118,730}{Br.100,000}$$

Example:

Consider the expected cash flows for project L and you are expected to decide whether the project is accepted or rejected. Discounting rate or the project's cost of capital is 10%.

Year	Expected Net Cash Flow Project L	
0	(Br. 100,000)	**(30)**
1	10,000	
2	60,000	
3	80,000	

Solution:

Year	**Cash Flows (1)**	*Present Value Interest Factor at 10%* **(2)**	*Present Value* (3)= (1) x (2)
0	(Br.100,000)		
1	10,000	1/ (1.10)1 = .909	9,090
2	60,000	1/ (1.10)2 = .826	49,560
3	80,000	1/ (1.10)3 = .751	60,080
	Total Present Value of Inflows		118,730

It follows that,

$$\textbf{PI} = \frac{Present\ Value\ of\ Cash\ Inflow}{Initial\ Investment} = \frac{Br.118,730}{Br.100,000} = \underline{1.1873}$$

Decision: Accept the project as PI > 1.

Advantages and Disadvantages of Profitability Index

VI. The Internal Rate of Return (IRR)

- It is that rate at which present value of benefits equals the initial investment.
- In other words, it is that discount rate at which NPV equals zero.
- IRR represents Return on Investment in terms of percentage.
- IRR is popular appraisal criterion for capital budgeting decision.
- It is a method of ranking project proposals using the rate of return on an investment.
- IRR is calculated through trial and error method

Steps to be followed:

Step1. Find out factor
Factor is calculated as follows:

$$F = \frac{Initial\ Investment}{Cash\ Inflow}$$

Step 2 Find out positive net present value
Step 3 Find out negative net present value
Step 4 Find out formula net present value
Formula
IRR =Base factor +

$$\frac{Present\ Value\ of\ Cash\ Inflow}{Difference\ in\ Positive\ and\ negative\ NPV} * DP$$

Base factor = Positive discount rate
DP = Difference in percentage

Advantages

1. It considers the time value of money.
2. It takes into account the total cash inflow and outflow.
3. It does not use the concept of the required rate of return.
4. It gives the approximate/nearest rate of return.
5. It gives the same acceptance rule as the NPV method
6. Consistent with shareholders wealth maximization objective

Disadvantages

1. It involves complicated computational method.
2. It may have multiple rates (or may not have unique rate of return)
3. It fails to indicate a correct choice between mutually exclusive project
4. It is assume that all intermediate cash flows are reinvested at the internal rate of return.

I. Decision Rule of IRR Criterion

The decision rule when the IRR criterion is used to make accept-reject decisions is as follows:

- If IRR > Ko - Accept the proposal (project)
- If IRR < Ko - Reject the proposal (project)
- If IRR = Ko - Further analysis is required
- Other things being equal, when two projects have the same net initial investment but different IRR, the project with higher IRR is preferred.

Example 1: Assume that a project for Jallis Inc. has equal net cash inflows of Br. 50,000 over its seven-year life and a project cost of Br. 200,000. By dividing the cash flows into the project investment cost, a factor of 4.00 (Br. 200,000 ÷ Br. 50,000) is found. The 4.00 is looked up in the Present Value of an Annuity of Br. 1 table on the seven-period line (it has a seven-year life), and the internal rate of return of 16% (the closest possible value to the actual IRR) is determined as in table below.

Partial Present Value of an Annuity of Birr 1

Period	2%	4%	5%	6%	8%	10%	12%	14%	16% ↓	18%	20%	22%
1	0.9804	0.9615	0.9524	0.9434	0.9259	0.9091	0.8929	0.8772	0.8621	0.8475	0.8333	0.8197
2	1.9416	1.8861	1.8594	1.8334	1.7833	1.7355	1.6901	1.6467	1.6052	1.5656	1.5278	1.4915
3	2.8839	2.7751	2.7232	2.6730	2.5771	2.4869	2.4018	2.3216	2.2459	2.1743	2.1065	2.0422
4	3.8077	3.6299	3.5460	3.4651	3.3121	3.1699	3.0373	2.9137	2.7982	2.6901	2.5887	2.4936
5	4.7135	4.4518	4.3295	4.2124	3.9927	3.7908	3.6048	3.4331	3.2743	3.1272	2.9906	2.8636
6	5.6014	5.2421	5.0757	4.9173	4.6229	4.3553	4.1114	3.8887	3.6847	3.4976	3.3255	3.1669
7→	6.4720	6.0021	5.7864	5.5824	5.2064	4.8684	4.5638	4.2883	**4.0386**	3.8115	3.6046	3.4155
8	7.3255	6.7327	6.4632	6.2098	5.7466	5.3349	4.9676	4.6389	4.3436	4.0776	3.8372	3.6193
9	8.1622	7.4353	7.1078	6.8017	6.2469	5.7590	5.3282	4.9464	4.6065	4.3030	4.0310	3.7863
10	8.9826	8.110	7.721	7.360	6.710	6.144	5.650	5.216	4.833	4.494	4.192	3.923

Period	2%	4%	5%	6%	8%	10%	12%	14%	16% ↓	18%	20%	22%
		9	7	1	1	6	2	1	2	1	5	2

CHAPTER 5:
BOND AND STOCK VALUATION AND THE COST OF CAPITAL

Assets may be classified into physical assets and financial assets. Physical assets include buildings, furniture, equipment, inventory, etc. Financial assets, on the other hand, include notes, bonds, commercial papers, Treasury bills, common stocks, preferred stocks, etc. Financial assets are bought and sold in the financial market. Issuer and buyer (investor) are the major participants in financial asset transactions. This chapter is concerned with the valuation of financial assets, especially, common stock, preferred stock, and bonds from the perspective of the investor.

5.1 Bond and Stock Valuation

Definitions of Value

The term value is often used in different contexts, depending on its application. Examples of different uses of this term include book value, liquidation value, market value, and intrinsic value.

Book value is the value of an asset as shown on the firm's balance sheet. It represents a historical value rather than a current worth..

Liquidation value is the amount that could be realized if an asset were sold individually and not as a part of a going concern.

Market value of an asset is the observed value for the asset in the marketplace. This value is determined by supply and demand forces working together in the marketplace, where buyers and sellers negotiate a mutually acceptable price for the asset.

Intrinsic value of an asset can be defined as the present value of the asset's expected future cash flows. This value is also called the fair value, as perceived by the investor, given the amount, timing, and riskiness of future cash flows. In essence, intrinsic value is like the value in the eyes of the investor.

Valuation: An Overview

For our purposes, the value of an asset is its intrinsic value, which is the present value of its expected future cash flows, where these cash flows are discounted back to the present using the investor's required rate of return. This is true for valuing all assets. Thus, ***value is a function of three elements***:

1. The amount and timing of the assets expected cash flows.
2. The riskiness of these cash flows
3. The investor's required rate of return for undertaking the investment

The first two factors are characteristics of the asset and the third one is a need of the investor. The required rate of return is the minimum rate necessary to attract an investor to purchase or hold a security.

Valuation: The Basic Process

It is assigning value to an asset by calculating the present value of its expected future cash flows using the investor's required rate of return.

$$V= \frac{C_1}{(1+k)^1} + \frac{C_2}{(1+k)^2} + \ldots\ldots + \frac{C_n}{(1+k)^n}$$

Or

$$\mathbf{V=} \sum_{t+1}^{n} \frac{C_t}{(1+k)^t}$$

Where

V= the intrinsic value of an asset producing future cash flows, C_t , in years 1 through n.

C_t = cash flow to be received in year t.

K= the investor's required rate of return.

10.1.1 Valuation of Bonds

Bonds are long-term sources of borrowing. A company issues bonds when it wants to raise large sum of money from the public at large. This type of financing instrument is simply a long-term promissory note, issued by the borrower, promising to pay its holder (the investor, the creditor) a predetermined and fixed amount of interest each period plus the principal at the end of the term or maturity. Factors directly affect the cash flows from owning a bond:

- The bond's par value,
- Maturity date, and
- The coupon rate of interest.

The process of valuing a bond requires first that we understand the terminologies and institutional characteristics of a bond.

Terminologies

Par Value:

- It is the price at which the bond will be redeemed by the issuing company (the borrowing company) at the end of the life of the bond.
- It cannot be altered after the bond has been issued.
- The par value is essentially independent of the intrinsic value of the bond.
- Although the price of the bond fluctuates in response to changing economic and market conditions, the par value remains constant.

Coupon Interest Rate: The annual interest rate paid on the par value of the bond. The bond's annual coupon (interest) equals the coupon rate time's par value.

Market Value: is the bond's current price. It is the price at which bonds are trading in the marketplace.

Yield to Maturity: is the bond's required rate of return. The yield to maturity is the discount rate that equates the bonds market value with the present value of future interest payments and redemption of par value.

RELATIONSHIP BETWEEN COUPON AND YIELD

If YTM > coupon rate, then bond price < par value
Selling at a discount

If YTM < coupon rate, then bond price > par value
Selling at a premium

IF YTM = coupon rate, then bond price = par value
Selling at a premium

Valuation Procedure

The value of a bond is the present value both of future interest to be received and the par or maturity value of the bond.

Thus, the bond valuation equation can be stated as follows:

$Bo = (I^* ADF K_{b,} n) + (M^* DFK_{b,} n)$

Where:

Bo= value of the bond

I= annual interest amount

K_b= the investor's required rate of return on the bond

n= term of the bond

M= par value of the bond

ADF k_b, n = annuity discounting factor of the interest payment at the required return and

Term of the bond.

DF k_b, n = Discounting factor at the required rate of return and the term of the

Bond, n.

OR

$$PV = \sum_{t=1}^{n} \frac{C}{(1+r)^t} + \frac{TV}{(1+r)^n}$$

PV = Present value of the bond today

C = Coupon rate of interest

TV = Terminal value repayable

R = Appropriate discount rate or market yield

N = Number of years to maturity

The valuation process for a bond requires knowledge of three essential elements:

1. The amount of the cash flows to be received by the investor,

2. The maturity date of the loan, and
3. The investor's required rate of return.

The amount of cash flows is dictated by the periodic interest to be received and the par value to be paid at maturity. Given these elements, we can compute the intrinsic value of the bond.

Example: Consider that Abay Company, on January 1, 2008 issued a 10% coupon interest, 10 year, Br 1,000 par value bond. The required rate of return on the bond is 10%. What is the value of this bond to the investor?

Interest = Br 1, 000 x 10% =Br 100
Bo = (Br 100* ADF 10%, 10) + (Br 1,000* DF 10% 10)
Bo = (100 * 6.1446) + (1000* 0.3855)
Bo = Br 1,000

When the required rate of return on a bond is the same as its coupon rate, the value of the bond is always equal to its par value.

Required Returns and Bond Values

Whenever the required return on a bond differs from the bond's coupon interest rate, the bond's value will differ from its par or face value. The required return on the bond is likely to differ from the coupon interest rate because of several reasons, for example,

1) Economic conditions have changed, causing a shift in the basic cost of long-term funds, or
2) The firm's risk has changed.

Increases in the basic cost of long-term funds or risk will raise the required return whereas decreases in the basic cost or risk will lower the required return.

Regardless of the exact cause, when the required rate of return on a bond is greater than its coupon interest rate, the value of the bond will be less than its par value. In this case, the bond is said to **sell at a discount**. The discount is equal to the difference between the intrinsic value and the par value of the bond, M – Bo.

On the other hand, when the required rate of return falls below the coupon interest rate, the bond value will be greater than its par value. In this situation, the bond is said to sell at a premium..

Assume that another investor viewed the bond of Abay Co. to be riskier and thus requires 12% rate of return on this bond. Find its value.

Bo= [(Br 1,000 * 10%)* ADF 12%, 10] + (Br 1,000 * DF 12%, 10)
= (100* 5.650) + (1000* .322)
Bo = Br 887

Further assume that an investor requires 8% return on this bond. Find its value.

Bo= [(Br 1,000* 10%) * ADF 8%m 10] + (Br 1,000* DF 8%,10)
= (100*6.710) + (1000* .463)
Bo = Br 1,134

Semiannual Interest Payments

From bonds that pay interest semiannually, we need to adjust the size of the interest payment as the coupon interest amount is to be paid in two semiannual installments rather than a onetime annual payment. Besides, the discounting factors should be adjusted accordingly to comply with the payments.

Bo = (½* ADF $k_{b/2}$, 2n) + (M* DF $k_{b/2}$, 2n)

Example: Assume that Truth Company has issued a 9%, Br 1,000, 6-years bond that pays interest semiannually. The investor's required rate of return is 8%.

The semiannual interest payment = Br 1000 x 9% x 0.5 = Br 45

Bo= (45* ADF4%, 12) + (1,000* DF4%, 12)
Bo = (45*9.3851) + (1,000* .6246)
Bo = 1,046.93

Yield to Maturity (YTM)

YTM is the rate of return investors earn if they buy the bond at a specific price, Bo, and hold it until maturity. The measure assumes that the issuer makes all scheduled interest and principal payments as promised. YTM is computed as follows:

$$YTM = \frac{1+(M - Bo)/n}{(M + Bo)_{/2}}$$

Example: Modesty Company bond which currently sells for Br 1,080 has a 10% coupon interest rate and Br 1,000 par value, pays interest annually, and has 10 years to maturity. Find its YTM.

$$YTM = \frac{100+(1000-1080)/10}{(1000+1080)/2}$$

YTM **= 8.85%**

10.1.2 Valuation of Stocks

(a) Preferred Stock Valuation

Like a bondholder, the owner of preferred stock should receive a constant income from the issue in each period. However, the return from preferred stock comes in the form of dividends rather than interest. In addition, while bonds generally have a specific maturity date, most preferred stocks are perpetuities. In this instance, finding the value of preferred stock, VP, with a level cash flow stream continuing indefinitely, is exactly like finding the present value of a perpetual annuity.

$$V_p = \frac{Annual\ Dividend}{Required\ Rate\ of\ Return} = \frac{D}{K_p}$$

Example: Consider that Norms Company preferred stock pays an annual dividend of Br 3.5. The shares do not have maturity date; that is they go to perpetuity. The investor required rate of return is 7%. Find its value.

V_P = Br 3.5 /.07= Br 50

(b) Common Stock Valuation

In case of equity shares, the future stream of earnings or benefits poses two problems. One, it is neither specified nor perfectly known in advance as an obligation. Resulting this, future benefits and their timing have both to be estimated in a probabilistic frame work. Two, there are at least three are three elements which are positioned as alternative measures of such benefits namely dividends, cash flows and earnings.

The valuation of common stock has three methods.

a) zero growth model
b) constant growth model
c) multiple growth model

a) Zero growth model

Under this the assumption is the growth of dividend is zero or constant.

$$Vc = \frac{D}{K}$$

Vc = Value of common stock
D = Dividend paid
K = the required rate of return

Example: A company pays a cash dividend of Birr 9 per share on common share for an indefinite period of future. The required rate of return is 10% and the market price of the share is Birr 80. Would you buy the share at its current price?

$$Vs = \frac{D}{K} = \frac{9}{.10} = \underline{\underline{90}}$$

Yes, the price is more than value; you would consider buying the share.

b) Constant Growth Model

The dividend payable to common stock holders will grow at a uniform rate is future. It can be written as below.

$$Vc = \frac{Do\ (1 + g)}{k - g}$$

Do = Dividend paid
g = growth rate
k = desired rate of return.

Ex. Alfa Company paid a dividend of Birr 2 per share on common stock for the year ending March 31, 2003. a constant growth of 10% per annum has been forecast for an indefinite future. Investors required rate of return is 15%. You want to buy the share at market price quoted on July 31, 2003 is stock market at Birr 60 what would be your decision?

$$Vs = \frac{Do\ (1 + g)}{k - g} = \frac{2\ (1 + .10)}{15 - .10} = \frac{2\ (1.10)}{.05} = \frac{2.20}{.05}$$

Vs = 44

Value is less than price, so you do not buy.

Example: Nissan Ltd paid a dividend of Birr 4 per share for the ending march 31, 2003. The growth rate is 10% forever. The required rate of return is 15%. You want to buy the share at a market price of Birr 80 in stock exchange. What would you do?

$$Vs = \frac{Do\ (1 + g)}{k - g} = \frac{4\ (1 + .10)}{15 - .10} = \frac{4.40}{.05}$$

Vs = 88

Here the price is more than value. Hence, you prefer to buy.

C) Multiple-Growth Model:

The multiple growth assumption has to be made in a vast number of practical situations. The infinite future time period is viewed as divisible into two or more different segments.

The investor must forecast the time 'T' up to which growth would be variable and after which only the growth rate would show a pattern and would be constant. This mean that present value calculations will have to be spread over two phases viz. one phase would last until time 'T' and the other would begin after 'T' to maturity.

$$\text{Growth Rate}_1 = \frac{D_1 - D_0}{D_0}$$

$$\text{Growth Rate}_2 = \frac{D_2 - D_1}{D_1}$$

$$VT(1) = \frac{D_t}{(1+k)^t}$$

$$VT(2) = \frac{D_{T+1}}{(k-g)(1+k)^T}$$

Combined equation for $V_{T(1)} + V_{T(2)}$

$$= \frac{Dt}{(1+k)^t} + \frac{D_{T+1}}{(k-g)(1+k)^T}$$

Example: Ethio Power Corporation paid dividend of 0.75 cents per share during the last year. The company is expected to pay Birr 2 per share during next year. Investors tore cast is a dividend of Birr 3 per share after that. At this time, the forecast is that dividends will grow at 10% per year into an indefinite period. Would you buy/sell the share if the current price is Birr 54. The required rate of return is 15%.

Solution:

This is a case of multiple growth. The growth rates for the first phase must be worked out and time partition. Growth rates before T are

$$g_1 = \frac{D_1 - D_0}{D_0} = \frac{2-0.75}{.75} = \mathbf{\frac{4.01}{}}$$

$$V_{T(1)} = \frac{Dt}{(1+k)^t} = \frac{2}{(1+.15)} + \frac{3}{(1+.15)^2} = 1.74 + 2.27 = 4.01$$

$$= \frac{1.25}{.75}$$

$$\mathbf{g_1 = 167\%}$$

$$V_{T(2)} = \frac{DT+1}{(k-g)(1+k)^T}$$

$$= \frac{3.30}{(.15-10)(1+.15)^2}$$

$$g_2 = \frac{D_2 - D_1}{D_1}$$

$$= \frac{3-2}{2}$$

$$= \frac{1}{2}$$

$$\mathbf{g_2 = 50\%}$$

$$= \frac{3.30}{(.05)(1+.15)^2}$$

$$= \frac{3.30}{(.05)(1+.15)^2}$$

$$\mathbf{V_{T(2)} = 49.91}$$

$$V_0 = V_{T(1)} + V_{T(2)}$$

$$V_0 = 4.01 + 49.91$$

V_0 = **53.92**

The current price is 54 Birr, the share is fairly and priced you can buy it

5.2 Cost of Capital

Cost of capital is the rate of return that a firm must earn on its project investments to maintain its market value and attract funds.

Companies raise money from a variety of sources:

(1) Short-term sources such as accounts payable, bank loans, and commercial paper, and

(2) Long-term sources such as bonds preferred stock, retained earnings, and sale of stock.

When companies invest this money (in the companies' assets), they obviously want to earn at least the average cost of raising the funds. The cost of raising the money, called the **cost of capital**, becomes the minimum desired rate of return for investing the money. If the cost of capital is 8.5%, then the minimum desired rate of return for investing the money is 8.5%.

Cost of capital is also used in the valuation of the firm and in evaluating its performances. Thus, it is used in investment decisions, pricing decisions, and in valuing the firm, and so on.

Specific Components of Cost of Capital

The specific components of cost of capital include: cost of debt, cost of preferred stock, cost of new common stock, and cost of retained earnings.

Cost of Debt

Cost of debt is the after tax cost of long-term funds through borrowing. Debt may be issued at par, at premium or at discount and also it may be perpetual or redeemable.

The cost of debt is measured by the interest rate or yield paid to bondholders. For example, Birr 1,000 bond paying Birr 100 annual interest provides a 10% yield.

Investors value bonds on the basis of current market rate of interest for similar bonds. The market rate of interest in turn, becomes the rate of return investors require if they hold the bond until maturity. This rate of return is frequently called yield to maturity. This is the average rate of return on income and the change in price that investors will receive if the bond is held to maturity. It takes both interest income and capital gains/losses into account

⇒ For example, a Birr 400 bond that pays Birr 40 interest is said to have a yield of 10%.

$$Y'(\text{cost of Debt}) = \frac{I + \frac{F - P_o}{n}}{\frac{F + P_o}{2}}$$

Where, Y1 = yield to maturity)

I = Interest

F = Face value

Po = Current selling price

N = Number of years

Example

A debt issue of Birr 500 each pays Birr 50 interest has a 15-year life and is selling currently for Birr 460. Assuming that tax rate is 40%, yield on the bond is computed as follows:

$$Y^1 = \frac{I + \frac{F - P_o}{n}}{\frac{F + P_o}{2}} = \frac{50 + \frac{500 - 460}{15}}{\frac{500 + 460}{2}}$$

= <u>10.97%</u>

Interest rate was $50 \div 500 = 10\%$; but since the investor received 50 from investment of Birr 460 (> than 10% = 10.97%).

Once the yield is determined, it should be adjusted for tax consideration. Yield to maturity indicates how much the firm has to pay on a before tax basis. Interest payment on bond is a tax-deductible expense. Since interest payment is tax deductible, its true cost is less than its stated cost.

Thus, Kd = Y^t (1-t)

Where t is the tax rate

Cost of debt (Kd), therefore, is:

Kd = Y1 (I – t)

= 0.1097 (I – 0.4)

= 0.1097 x 0.6 = **<u>6.58%</u>**

This is actual cost of debt paid by the firm; it is less than 10.97%

Cost of Preferred Stock

It refers to the required rate of return on investment of the preferred shareholders of the company. Cost of preferred stock is similar to that of debt in that a constant annual payment is made, but dissimilar in that there is no maturity date in which principal payment is made. In truth, the determination of the yield on preferred stock is simpler than determining the yield on debt. All you have to do is divide the annual dividend by the current price. This represents the rate of return to preferred stockholders as well as the annual cost to the corporation for the preferred stock issue.

The required rate of return, K_P, is computed as:

$$K_p = \frac{Dp}{Pp}$$

Where, Kp = The required rate of return on the preferred stock

DP = The annual dividend on preferred stock

Pp = The Price of preferred stock

Thus, cost of preferred stock, Kpr, is given by the formula

$$K_p = \frac{D1}{P1 - F}$$

D1 = Dividend /share
P1 = Price / share
F = Flotation cost, or selling cost / share

Example:
The price per preferred stock of a firm is Birr 250. An annual dividend of Birr 25 is paid on each share. The commission agent charges Birr 10 per share for selling the stock. Determine:
1) The investor's Required Rate of Return (RRR), KP, and
2) The cost of preferred stock of the firm, Kpr.

$$RRR = \frac{DP}{PP} = \frac{25}{250} = \underline{\underline{10\%}}$$

$$K_{Pr} = \frac{D_1}{P_1 - F} = \frac{25}{250 - 10} = \underline{\underline{10.4\%}}$$

Cost of New Common Stock
When common stock is issued, the firm must earn a slightly higher return to cover the distribution (flotation costs).
Cost of new common stock, (Kn), is given by the formula:

$$K_n = \frac{D}{P - F} + g$$

D = Dividend
P = Selling price
F = Flotation cost
g = Growth rate of dividend

Example
Assume that a common share of Birr 100 is sold with a flotation cost of 8 per share. The dividend at the end of the 1st year is 15 and an 8% growth is expected.

$$Kn = \frac{15}{100 - 8} + 8\% = \underline{\underline{24.3\%}}$$

Cost of Retained Earnings
Note that retained earnings are a component of equity, and therefore the cost of retained earnings (internal equity) is equal to the cost of equity as explained above. Dividends (earnings that are paid to investors and not retained) are a component of the return on capital to equity holders, and influence the cost of capital through that mechanism.
Retained Earnings belong to the common stockholders. By permitting the firm to retain earnings, shareholders incur an opportunity cost by giving up cash

dividends. So, they expect the firm to earn the same rate of return on Retained Earnings as it provides on common stock.

Cost of RE (K_r) = $\frac{D}{P} + g$

D = dividend,

P = selling price

g = growth rate of return

Cost of RE can be computed having the date in the above example as follows.

$$Kr = \frac{14}{100} + 8\% = 23\%$$