CHAPTER ONE

INTRODUCTION TO FINANCIAL MANAGEMENT

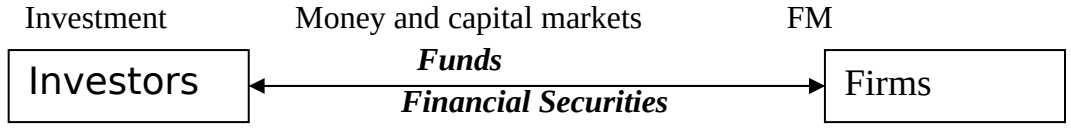
The Nature and Scope of Financial Management

The term 'nature' as applied to financial management refers to its relationship with the closely related fields of economics and accounting, its functions, scope and objectives.

Finance is the application of economic principles and concepts to business decision making and problem solving.

♥The three broad categories of finance are:

- **Financial management**: deals with the management of finance of firms. It is an applied economics concerned with the allocation of a company's scarce financial resources among competing choices and basically concerned with acquisition, financing and management of asset with the wealth maximization goal in mind.
- **Investment Analysis**: the study of the analysis and management of financial securities and is mainly concerned with the evaluation of securities from the perspective of investors and the construction and management of portfolios of securities.
- **Money and Capital market**: - the study of markets where securities issued are frequently sold and bought and financial intermediaries.



FINANCE AND RELATED DISCIPLINES

Financial management, an integral part of overall management, is not totally independent area. It draws heavily on related disciplines and fields of study, such as economics, accounting, marketing, production and quantitative methods.

A. FINANCE AND ECONOMICS

The financial manager should understand macroeconomics since firms operate in macroeconomic environment. Specifically financial manager should:

- Recognize and understand how monetary policies affect the cost of funds and the availability of funds.
- Be versed in fiscal policy and how it affects the economy
- Be aware of the various financial institutions/ financing outlets.
- Understand the consequences of various level of economic activity and changes in economic policy for his/her decision environment and so on.

The concepts and theories of microeconomics are relevant for financial management since they provide with the determination of optimal operating strategies. **Such relevant concepts and theories involve:**

- √ Supply and demand relationship and profit maximization strategies
- √ Issues related to mix of productive factors. 'optimal' sales level and product pricing strategies,
- √ Measurement and utility preference, risk and determination of value,
- √ Rationale of depreciating assets
- √ The principle of marginal analysis.

B. FINANCE AND ACCOUNTING

Generally speaking an accountant is responsible for developing financial reports and measures that assist its managers in assessing the past performance and future direction of the firm and in meeting

certain legal obligations, such as payment of taxes. The financial manager refers to accounting data when making future resource allocation decisions, concerning long-term investment, when managing current investment in working capital and when making a number of other financial decisions.

But there are key differences between accounting and finance:

- The treatment of funds and
- The purpose

The measurement of the funds (income and expenses) in accounting is based on the accrual principle. For instance, revenue is recognized at the point of sale and not when collected. Similarly, expenses are recognized when they are incurred rather than when they actually paid. The viewpoint of finance relating to the funds of the firm is based on **cash flows**.

The revenues are recognized only when actually received in cash and expenses are recognized on actual payment. Finance and accounting also differ in their purposes. The purpose of accounting is collection and presentation of financial data. The financial manager uses such data for financial decision making.

THE FUNCTIONS OF FINANCIAL MANAGEMENT

1. INVESTMENT DECISIONS

- These decisions are referred also as capital budgeting decisions.
- It generally answers the question that what assets should the firm own.

Investment decision or capital budgeting involves the decision of allocation of capital or commitment of funds to long-term assets that would yield benefits in the future.

Two important aspects of investment decision are;

a) The evaluation of the prospective profitability of new investments and
b) The measurement of **cut-off rate** against that prospective return of new investment could be compared

Future benefits of investments are difficult to measure and cannot be predicted with certainty. Because of the uncertain future, investment decisions involve risk. Investment proposals should, therefore, be evaluated in terms of both **Expected Return** and **Risk.**

Besides the decision to commit funds in new investment proposals, capital budgeting **also involves** decision of **recommitting funds** when an asset becomes **less productive or non –productive.**

There is a broad agreement that the correct **cut-off rate** is **the required rate of return** or **the opportunity cost of capital.** However, there are problems in computing the opportunity cost of capital in practice from the available data and information. A decision maker should be aware of these problems.

2. FINANCING DECISIONS

- It is a decision as to when, where and how to acquire funds to meet the firm's investment needs.
- The central issue here is to determine the proportion of equity and debt.

It's the second important function to be performed.

The mix of debt and equity is known as the firm's capital structure. So the finance manager ***must strive to obtain the best financing mix or optimum capital structure***. The firm's capital structure is considered to be optimum when the market value of share is maximized.

The use of debt affects the return and risk for shareholders, it may increase the return on equity funds but it always increases risk. A proper balance will have to strike between return and risk.

3. DIVIDEND DECISIONS

The financial manger must decide whether the firm should:

- Distribute all profits, or
- Retain them, or

- Distribute a portion and retain the balance.

Like the debt policy, the dividend policy should be determined in terms of its impact on the shareholders value. The optimum dividend policy is one that maximizes the market value of the firm's shares.

Such dividend policy decisions should also consider the questions of:

√ Dividend stability
√ Bonus shares and
√ Cash dividends in practice

Most profitable companies pay cash dividends regularly. Periodically, additional shares, called bonus shares or (stock dividend) are also issued to the existing shareholders in addition to the cash dividend.

4. ASSET MANAGEMENT DECISIONS

After the assets are acquired, they need to be managed effectively. The financial manger is charged with the varying degree of operating responsibility over the existing assets.

5. LIQUIDITY DECISIONS

Current assets management that affects a firm's liquidity is yet another important finance function, in addition to the management of long-term assets. Current assets should be managed efficiently for safeguarding the firm against the dangers of liquidity and insolvency.

Investment in current assets affects the firm's

- Profitability
- Liquidity and
- Risk

A conflict exists between profitability and liquidity while managing current assets. If a firm does not invest sufficient funds in current asset, it may become illiquid. But it would lose its profitability, since idle current asset would not earn anything. Thus, proper trade-off must be achieved between profitability and liquidity.

In order to ensure that neither insufficient nor unnecessary fund is invested in current assets, sound techniques of managing current assets should be developed. It would thus be clear that financial decisions directly concern the firm's decision to acquire or dispose of assets and require commitment and recommitment of funds on a continuous basis.

The Goal of a Business Firm

- A goal is a well-known objective the firm strives in all its action to achieve, and then efficient financial management requires the existence of some objective so as to decide efficiently in light of these standards.
- Possible goals: Survive, Avoid financial distress and bankruptcy, Beat competition, Maximize sales or market share, Minimize cost, Maximize profit, Maintain steady earning growth… etc.
- Most of the goals mentioned above are vague however to use them as a guideline for decision-making.

Would profit maximization serve as a goal of the firm?

☑ Let us investigate the profit maximization as a goal of the firm. It fails with respect to the following operational infeasibilities:

A. **The concept is vague**: The first thing is to agree on the term. It is vague because the definition of the term profit is ambiguous.
   - Does it mean an absolute figure expressed in dollar or a rate of profitability or does it mean short-term or long-term profits?
   - Does it refer to profit after tax or before tax?
   - Total profit or profit per share or

- Is it a percentage dollar a firm can have or an increased amount simply by issuing a stock and investing on Treasury bill? Some propose a relatively better that is to maximize the earning per share. Yet it falls short of the under mention elements

B. **The time dimension of financial decision is ignored.**

- This means the profit maximization objective does not make a distinction between returns received in different time periods.
- It gives no considerations to the time value of money, and it values benefits received today and benefit received after a period as the same.

C. **The risk dimension of financial decision is ignored**.

Would wealth maximization serve as a goal of the firm?

- It is long agreed that every individual wants to maximize his utility or satisfaction.
- And the closest single substitute for it is wealth maximization.
- Here the goal has to be quantifiable and operational.
- Operational mean it has to be explicitly tied to the variables on which the firm has some control through its operation.

- **The objective of shareholders wealth maximization has a number of distinct advantages:**
  i. The objective explicitly considers the timing and risk of the benefit expected to be received from stock ownership.
  ii. It is conceptually possible to determine whether a particular financial decision is consistent with these objectives.
  iii. It is impersonal objective.
    - ♥ For these reasons, the shareholders wealth maximization objective is the primary objective in financial management.

This is also known as **value maximization** or **net present worth maximization**. This removes the technical limitations, which characterize the earlier profit maximization criterion. Its operational features satisfy all the three requirements of a suitable operational objective of financial course of action namely, exactness, quality of benefits and time value of money.

The value of an asset or a course of action can be judged in terms of the value of the benefits it produces less the cost of undertaking it. To estimate the benefit associated with a financial course of action, the wealth maximization criterion uses the concept of cash flows generated by the decision rather than accounting profit, which is the basis of the measurement of benefits in the case of profit maximization criterion. Cash flow is a precise concept with a definite connotation. Measuring benefits in terms of cash flow avoids the ambiguity associated with accounting profits.

To incorporate the time value of money and quality dimensions of benefits, adjustments should be made in the cash flow pattern, first, to incorporate risk, and secondly, to make an allowance for differences in the timing of benefits. The value of a stream of cash flows with value maximization criterion is calculated by discounting its element back to the present at a capitalization rate that reflects both time and risk. In applying the value maximization criterion, the term value is used in terms of worth to the owners that is ordinary shareholders.

The discount rate that is employed is, therefore, the rate that reflects the time and risk preference of the owners or suppliers of capital. As a measure of quality (risk) and timing, it is expressed in decimal notation. A large discount rate is the result of higher risk and longer time period. As a decision criterion, this approach involves a comparison of value to cost. An action that has a discounted value- reflecting both time and risk- that exceeds its cost can be said to create value. Such actions should be undertaken. Conversely, actions, with less value than cost, reduce wealth and should be rejected. It would also be noted that the focus of financial management is on the value to the owners of suppliers of equity capital.

- √ **There are two ways in which the ownership of common stocks can change a person's wealth**:
  (a) dividends can be paid to the stockholder and;
  (b) the market price of the stocks can change.
- √ **During any period of time, the change in a person's wealth due to ownership of common stock may be calculated as follows**:
  i. Multiply the dividend per share paid during the period by the number of shares owned.
  ii. Multiply the change in the stock's price during the period by the number of shares owned.
  iii. Add the dividends and the change in the market value computed to obtain the change in the shareholders wealth during the period.

In order to maximize the wealth of its owners, a corporation must seek to provide the largest attainable combination of dividends per share and stock price appreciation.

AGENCY PROBLEM AND CONTROL OF THE CORPORATION

Financial managers most of the time acts in the best interest of the stockholders by taking actions that increase the value of the stock, however, in large corporations ownership can be spread over a huge number of stockholders. This dispersion of ownership means that the management effectively controls the firm. In this case, will management necessarily act in the best interests of the stockholders? Put another way, might not management pursue its own goals at the stockholders' expense?

❖ Agency Relationships

The relationship between stockholders and management is called an **agency relationship.** Such a relationship exists whenever someone (the principal) hires another (the agent) to represent his/her interests. In such relationship there is a possibility of conflict of interest between the principal and the agent. Such a conflict is called an ***agency problem***. For example, you might hire someone (an agent) to sell a car that you own and that you are agree to pay that person a flat fee when he or she sells the car. The agent's incentive in this case is to make the sale, not necessarily to get you the best price. If you paid a commission of, say, 10% of the sales price instead of a flat fee, then this problem might not exist. This example illustrates that the way in which an agent is compensated is one factor that affects agency problems.

❖ Management Goals

Management and stockholders interest might differ. For instance, consider a new investment that is expected to favorably affect the share value but which is of a risky venture. The owners of the firm might wish to take the investment because the stock value will rise, but management may not because there is the possibility that things will turn out badly and management jobs will be lost.

If management does not take the investment, then the stockholders may lose a valuable opportunity. This is one example of an agency cost. An agency cost is the costs of the conflict of interest between stockholders and management. Managers would tend to maximize the amount of resources over which they have control or, more generally, corporate power or wealth. This goal could lead to an overemphasis on corporate size or growth. For example, cases in which management is accused of overpaying to buy up another company just to increase the size of the business or to demonstrate corporate power are most common.

Obviously, if overpayment does take place, such a purchase does not benefit the stockholders of the purchasing company. Therefore, management may tend to overemphasize organizational survival to protect job security. Also, management may dislike outside interference, so independence and corporate self-sufficiency may be important goals.

Do Managers Act in the Stockholders' Interests?

Whether managers will, in fact, act in the best interests of the stockholders depends on *two factors*:

First, how closely is management goals aligned with stockholder goals? This question relates to the way managers are compensated.

Second, can management be replaced if they do not pursue stockholder goals? This issue relates to control of the firm.

There are a number of reasons to think that, even in the largest firms, management has a significant incentive to act in the interests of stockholders:

1. Managerial Compensation

Management will frequently have a significant economic incentive to increase share value for two reasons. *First*, managerial compensation, particularly at the top, is usually tied to financial performance in general and oftentimes to share value in particular.

The *second* incentive managers have relates to job prospects. Better performers within the firm will tend to get promoted. More generally, those managers who are successful in pursuing stockholder goals will be in greater demand in the labor market and thus command higher salaries.

2. Control of the Firm

Control of the firm ultimately rests with stockholders. They elect the BOD, who in turn, hire and fire management.

NB. The available theory and evidence are consistent with the view that stockholders control the firm and that stockholder wealth maximization is the relevant goal of the corporation. Even so, there will be times when management goals are pursued at the expense of the stockholders, at least temporarily.

FINANCIAL MARKETS AND INTERMEDIARIES

The primary advantages of the corporate form of organization are that ownership can be transferred more quickly and easily than with other forms and that money can be raised more readily. Both of these advantages are significantly enhanced by the existence of financial markets.

A financial market, like any market, is just a way of bringing buyers and sellers together. Financial markets differ from other markets in detail. The most important differences concern the types of securities that are traded, how trading is conducted, and who the buyers and sellers are.

Financial markets can be characterized as to:

1. Whether the assets are being issued for the first time or have previously entered the market and
2. The maturity dates of the assets.

⇒ Primary and Secondary Financial Markets

A primary financial market is a market whereby new financial assets are issued. Whereas Secondary financial market is a market whereby previously issued financial instruments are offered for resale.

Money and Capital Markets

When a financial asset has a relatively short maturity, it is said to appear and be sold in the money markets, whereas, financial assets with longer or indefinite lifetimes are said to appear in the capital markets. In financial markets, it is financial assets that are bought and sold. Financial asset is a claim against the income and assets of its issuer. They are assets to the holder of the claim but they are also liabilities or equity items to the issuer. Debt and equity securities are considered as financial assets.

The process of transferring funds from savers to ultimate users through a third party is called **intermediation**. The third party is said to be financial intermediaries, which are often called financial institutions. These are commercial banks, insurance companies, pension funds, cooperatives, and others.

CHAPTER TWO
FINANCIAL ANALYSIS

Objectives of Financial Analysis

The three fundamental accounting statements are the Income Statement, the Balance Sheet, and the Cash Flows statement. The analysis of these statements combined with the preparation and analysis of related financial statements is called financial statement analysis. The focus of financial analysis is on key figures in the financial statements and the significant relationships that exist between them. The analysis of financial statements is a process of evaluating the relationship between component parts of financial statements to obtain a better understanding of the firm's performance and financial position. This type of analysis allows managers, investors, and creditors, as well as potential investors and creditors, to reach conclusions about the recent and current financial status of a corporation. What is perhaps more important, financial statement analysis is used in forming expectations about a corporation's future financial performance.

☑ Types of Financial Analysis

There are three major types of financial statement analysis. These are:

1. Common-Size Statement Analysis
2. Trend Analysis
3. Ratio Analysis

➢ 1. Common Size Statement Analysis

The first step in executing an analysis of financial statements is to carefully read the statements and their accompanying notes. Then compare them to those of other, similar, companies. It is almost, however, impossible to directly compare the financial statements for two companies because of their differences in size and other factors. To start making comparisons, one obvious thing that we should do is to somehow standardize the financial statements. One very common and useful way of doing this is to work with percentages instead of total dollars. A useful way of standardizing financial statements is to express each item on the balance sheet as a percentage of assets and to express each item on the income statement as a percentage of sales. The resulting financial statements are called Common-Size Statements.

One way, though not the only way, to construct a common-size balance sheet is to express each item as a percentage of total assets. And also, a useful way of standardizing the income statement is to express each item as a percentage of sales. In this form, financial statements are relatively easy to read and compare.

➢ 2. Trend Analysis: Common-Base Year Financial Statement Analysis

If we were given a balance sheet of say for the last five years for some company and asked to investigate trends in the firm's pattern of operations, it will be somehow better to standardize the financial statements by choosing a base year and expressing each item relative to the base amount. A standardized financial statement presenting all items relative a certain base-year amount is called Common-Base Year Statement. In this case, the resulting series or trend is very easy to plot, and it is then very easy to compare two or more different companies.

➢ 3. Ratio Analysis

Another way of avoiding the problems involved in comparing companies of different sizes is to calculate and compare financial ratios. Such ratios are ways of comparing and investigating the relationships between different pieces of financial information. Ratio analysis is defined as the systematic use of ratio to interpret the financial statements so that the strength and weakness of a firm as well as its historical performance and current financial condition can be determined. The rationale of ratio analysis lies in the fact that it makes related information comparable. A single figure by itself has no meaning but when expressed in terms of a related figure, it yields significant inferences.

MAJOR TYPES OF RATIO ANALYSIS

Financial ratios are traditionally grouped into the following categories:

1. **Short-term Solvency** or **Liquidity ratios**-measure the firm's ability to pay its bills (current liabilities) over the short run without undo stress.
2. **Asset Management** or **Asset Turnover** or **Activity ratios**-measure how efficiently or intensively a firm uses its assets.
3. **Long-term Solvency**, or **Debt or Financial Leverage ratios**-measures the firm's long run ability to meet its obligations and the extent to which a firm finances itself with debt as opposed to equity sources.
4. **Profitability ratios**-measure the firm's ability to earn a positive rate of return for its owners.
5. **Market value ratio: -** Measures whether the forms stock is selling bellow or above stock price in the security market.

- **1. Short-Term Solvency or Liquidity Ratios**

These ratios are intended to provide information about a firm's liquidity and so they focus on current assets and current liabilities. These ratios assume that current assets are the principal source of cash for meeting current liabilities. For obvious reasons, liquidity ratios are particularly interesting to short-term creditors. One advantage of looking at current assets and liabilities is that their book values and market values are likely to be similar.

Illustration

P-Corporation

Statements of Financial Position

December 31, 2015 & 2016

	2015	**2016**
Assets		
Fixed Assets:		
Net property, Plant & Equp.	$2,731m	$2,880m
Current Assets:		
Inventory	$ 393m	$422m
A/R	165	188
Cash	84	98
Total	$642	$708
Total Assets	**$3,373**	**$3,588**
Liabilities & Owner's Equity		
Long term debt	$531	$457
Current liabilities:		
N/P	$ 231	$196
A/P	312	344
Total	$543	$540
Owners' equity:		
Common stock &		
Paid-in surplus	$500	$550
Retained earnings	1,799	2,041
Total	$2,299	$2,591
Total Liab. & Equity	**$3,373**	**$3,588**

P-Corporation
Profit or loss Statement
For the year ended December 31, 2016

Sales		$2,311m
CGS		1,344
Depreciation		276
EBIT		$ 691
Interest paid		141
Taxable income		$ 550
Taxes (34%)		187
Net income		363
Dividends	$121	
Addition to Retained earnings	242	
Stock net of paid in surplus	396	
No. of outstanding share	33m	
Market price per share	$ 550/33= 16.66	

A) Current Ratio:

One of the best-known and most widely used ratios is the Current Ratio. The current ratio is defined as:

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

For P-Corporation, the 2016 current ratio = $\frac{\$708m}{\$540m}$ = **1.31 times**

Because current assets and liabilities are, in principle, converted to cash over the following 12 months, the current ratio is a measure of short-term liquidity. The unit of measurement is either dollars or times. So, we could say P-Corp. has $1.31 in current assets for every $1 in current liabilities, or we could say that P-Corp. has its current liabilities covered 1.31 times over.

To a creditor, particularly a short-term creditor such as a supplier, the higher the current ratio is the better and most often requires a current ratio to remain at or above 2.0. To the firm a high current ratio indicates liquidity that is the firm has less difficulty in paying its current liabilities, but it also may indicate an inefficient use of cash and other short-term assets.

Absent some extraordinary circumstances, we would expect to see a current ratio of at least 1, because a current ratio of less than 1 would mean that net working capital (CA - CL) is negative. This would be unusual in a healthy firm, at least for most types of businesses.

Question:

1. Suppose a firm pays off some of its suppliers and short-term creditors, what will happen to the current ratio?
2. Suppose a firm buys some inventory, what will happen to the current ratio?
3. What will happen to the current ratio if a firm sells some merchandise?

B) The Quick (or Acid-Test) Ratio

This ratio serves the same general purpose as the current ratio but excludes inventory from current assets. This is done because inventory is the least liquid current asset. Besides, relatively large inventories are often a sign of short-term trouble. The firm may have over estimated sales and over bought or over produced as a result. In this case, the firm may have a substantial portion of its liquidity tied up in slow-moving inventory. Thus, the quick ratio measures a firm's ability to pay its current liabilities by converting its most liquid assets into cash.

The Quick Ratio = Current Assets - Inventory
Current Liabilities

For P-Corp., this ratio in 2016 was = $708m - $422m = **0.53times**
$540m

If a firm seeks to pay its current liabilities by using its quick assets (current assets minus inventories), then its quick assets must equal or exceed its current liabilities. Thus, its quick ratio must be 1.0 or more. This is the reasoning behind the quick ratio standard of 1.0 that many analysts use as the dividing line between sufficient and insufficient liquidity.

- **2. Asset Management, or Asset Turnover, or Activity Ratios**

The measures in this section are sometimes called asset utilization ratios. They are intended to describe how efficiently or intensively a firm uses its assets to generate sales. Efficiency is equated with rapid turnover. In other words, this means the efficiency with which the assets are used would be reflected in the speed and rapidity with which assets are converted into sales. Some activity ratios concentrate on individual assets such as inventory or account receivable and others look at overall corporate activity.

A) Inventory Turnover and Day's Sales in Inventory

Inventory turnover measures the number of times per year that a corporation sells, or turns over, its inventory.

Inventory Turnover = Cost of Goods Sold
Inventory

For P-Corporation the inventory turn over = $1,344m = 3.2 times
$422m

This means that P-Corp. sold off or turned over the entire inventory on average 3.2 times in a year. As long as we are not running out of stock and thereby forgoing sales, the higher this ratio is, the more efficiently we are managing inventory. It might make more sense to use the average inventory in calculating turnover. Basically, however, it depends on the purpose of the calculation. If we are interested in how long it will take us to sell our current inventory, then using the ending figure is probably better. If we are worried about the past, in which case averages are appropriate. If we know that we turned our inventory over 3.2 times during the year, then we can figure out how long it took us to turn it over on average. The result is the average days' sales in inventory:

Days' sales in inventory = 365 days = Inventory × 365days
Inventory turnover Cost of Goods Sold

= 365 days = **114 days**
3.2

This tells us that, roughly speaking, inventory sits 114 days on average before it is sold. Alternatively, assuming we have used the most recent inventory and cost figures, it will take about 114 days to work off our current inventory.

B) Receivables Turnover and Days' Sales in Receivables

Receivable turnover measures the number of times per year that a corporation collects, or turns over, its receivables that are resulted from credit sales. Inventory turnover measures give some indication of how fast we can sell product while receivable turnover look at how fast we collect on those credit sales.

Receivable turnover = Credit Sales
Account receivables

For P-Corp., receivable turnover = $2,311m = **12.3 times**
$188m

Loosely speaking, this receivable turnover means P-Corp. collected its outstanding credit accounts and re loaned the money 12.3 times during the year. This ratio makes more sense if we convert it to days, so the days' sales in receivables are:

Days' Sales in Receivables = $\frac{365 \text{ days}}{\text{Receivable turnover}} = \frac{\text{Accounts receivable} \times 365 \text{ days}}{\text{Credit Sales}}$

$= \text{A/R} \times \frac{365 \text{ days}}{\text{Credit Sales}} = \frac{\text{Accounts Receivable}}{\text{Average credit sales per day}}$

$= \frac{365}{12.3} =$ **30 days**

Therefore, on average, P-Corp. collects on its credit sales in 30 days. This ratio is very frequently called the average collection period (ACP). It measures the average number of days it takes for a firm to collect its accounts receivable. If we are using the most recent figures, we could also say that we have 30 days' worth of sales currently uncollected.

C) Asset Turnover Ratios

1. **Fixed Asset Turnover** = $\frac{\text{Sales}}{\text{Net Fixed Assets}}$; For P-Corp, $\frac{\$2{,}311\text{m}}{\$2{,}880} =$ **0.80 times**

   For every dollar in fixed assets, P-Corp generated $0.80 in sales
2. **Total Asset turnover**- measures a corporation's ability to pay the interest on its debt. It is a measure of overall corporate activity. The total asset turnover can be used to measure the level of sales generated by a corporation against its production capacity.

❖ **Total Asset Turnover** = $\frac{\text{Sales}}{\text{Total Assets}}$; For P-Corp, $\frac{\$2{,}311\text{m}}{\$3{,}588\text{m}} =$ **0.64 times**

☑ For every dollar in assets, P-Corp generates $0.64 in sales.

➢ **3. Long-term Solvency, or Debt or Financial Leverage Ratios**

Long-term solvency ratios are intended to address the firm's long-term ability to meet its obligations. Two types of ratios are grouped under this heading. One type centers on the liabilities and stockholders' equity section of the balance sheet and measures the extent to which a corporation finances itself with debt as opposed to equity sources.

The second type attempts to measure the corporation's ability to generate a level of income sufficient to meet its debt obligations.

A) Total Debt Ratio-measure the percentage of total funds provided by debt.

❖ Subtracting this percentage from 1.0 gives the percentage of total funds provided by equity sources.

Total debt ratio= $\frac{\text{T. Assets} - \text{T. Owners' Equity;}}{\text{Total Assets}}$ **For P-Corp**, $\frac{\$3{,}588 - \$2{,}591}{\$3{,}588} =$ **0.28**

This means that P-Corp uses 28% debt, which means it has $0.28 in debt for every $1 in assets. Therefore, there is $0.72 in owners' equity.

There are two variations to this ratio:-

- Debt-Equity Ratio = $\frac{\text{Total Debt}}{\text{Total Equity}}$; For P-Corp, $\frac{\$997}{\$2{,}591} =$ **0.38 times**
- Equity Multiplier = $\frac{\text{Total Asset ;}}{\text{Total Equity}}$ For P-Corp, $\frac{\$3{,}588}{\$2{,}591} =$ **1.38 times**

❖ **Equity multiplier = 1 + debt equity ratio**

B) Long Term Debt Ratio: - measures the extent to which long term financing source is provided by creditors.

Long-term debt to equity ratio = $\frac{\text{Long-term debt}}{}$

Stockholders' equity

Frequently, financial analysts are more concerned with the firm's long-term debt than its short-term debt, because the short-term debt will constantly be changing. Also, a firm's A/P may be more of a reflection of trade practice rather than debt management policy.

. Long-term debt ratio = Long-term debt
Long-term debt + Total equity

These ratios are important for many financial analysts. They are used to measure the firm's optimal capital structure that maximizes the stockholders equity.

These ratios have many applications. For example, as many financial analysts are of the opinion that each corporation has its own optimal capital structure – measured by using debt ratios- that will make the greatest contribution to maximizing stockholder wealth. In addition, these ratios are often used as a measure of financial risk; that is, as debt becomes an increasing percentage of a corporation's financing sources, the probability of corporate insolvency increases due to its inability to meet debt obligations.

C) Times Interest Earned-measures a corporation's ability to pay the interest on its debt. It measures how well a company has its interest obligations covered, and it is often called the interest coverage ratio. A decreasing value of the times interest earned ratio is sometimes used as additional measure of financial risk.

Times Interest Earned = EBIT ; For P-Corp, $691m = **4.9 times**
Interest $141m

For P-Corp., the interest bill is covered 4.9 times over the interest payments required on its borrowed funds.

- **4. Profitability Ratios**

Profitability ratios provide an overall evaluation of the performance of a corporation and its management. These ratios are intended to measure how efficiently the firm uses its assets and how efficiently the firm manages its operations. These ratios measure the returns generated by the firm from several different aspects:

(1) on a per share basis,
(2) on per dollar-of-sales basis,
(3) on per dollar-of-asset basis, and
(4) on per dollar-of-stockholders' equity basis.

A) Earnings Per Share (EPS)

EPS expresses the profit per common share earned by a corporation during a period of time. It is the single most frequently analyzed and quoted financial ratio.

EPS = EAT - Preferred stock dividends
Number of common shares outstanding

Assuming that P-Corp. has 33 million outstanding shares, its EPS = $363m = **$11**
33m

B) Dividend Per Share (DPS)

DPS represents the dollar amount of cash dividends a corporation paid on each share of its common stock outstanding over a period of time.

DPS = Common stock cash dividends; For P-Corp, $121m = **$3.67**
Number of common shares outstanding 33m

C) Profit Margin

Profit margin/Net profit margin/ :- measures corporate profitability on a per dollar-of-sales basis.

Profit Margin = EAT ; For P-Corp., $363 = **15.7%**

Net Sales $2,311

This tells that P-Corp generates a profit of $0.157 dollar for every dollar in sales. All other things equal, a relatively high profit margin is desirable. Profit margin ratio results from the interaction during the accounting period of three factors:

(1) sales volume,

(2) pricing strategy, and

(3) cost structure. For example, lowering sales price will increase volume of units sold, but will normally cause profit margins to shrink.

D) Return on Investment (ROI) or Return on Asset (ROA)

ROI/ROA is a measure of profit per dollar of invested funds

ROI/ROA = EAT; For P-Corp, $363 = **10.12%**

TA $3,588

P-Corp. earned 10.12 cents of profit for each dollar of assets.

The ROI/ROA ratio essentially relates size to profits. If a corporation increases in size (as measured by total assets) but does not increase its earnings after taxes proportionally, then its ROI/ROA will decrease.

ROI/ROA = Profit margin × Asset turnover

- ROI/ROA = 15.71% x 64.41% = **10.12%**

The profit margin measures profitability per sales dollar, and total asset turnover is an activity ratio also based on unit sales. Thus, corporate ROI/ROA can be understood as occurring from a combination of profit margin and activity.

This expanded form of the ROI ratio can also be used to point out that simply increasing net sales will not increase the ROI because net sales cancel out in the calculation.

What is needed is to increase either the rate of profitability or the rate of asset turnover, or both. This demonstrates that the advantage using the expanded ROI equation lies not only in the ability to separate profitability from activity, but also in the fact that the analytical focus is centered on the rates per dollar of sales as opposed to the level of sales.

E) Return on Stockholders' Equity or Return on Net Worth

ROE measures corporate profitability per dollar of equity capital. Because benefiting shareholders is our goal, ROE is, in an accounting sense, the true bottom-line measure of performance.

ROE = EAT

Stockholders' Equity

- ROE = 363 / 2561 = **14%**

5. **Market value ratio**

Market value ratio indicates the value of company's share in the stock market. Now a days investors are highly interested to know market value of company's stock before making investment decision. Investors purchase stock to earn a return on their investment. This return consists of two parts: (1) gains (or losses) from selling the stock at a price above or below purchase price and (2) dividends. Three ratios help analysts to evaluate stock investment. to compute determine market price a well known stock exchange market is necessary. in our country there is no such market and it is not possible to compute this ratio.

A) Price/earnings ratio (P/E)

The price/earnings ratio is the ratio of the market price of a share of common stock to the company's earnings per share. It shows the market price of Br1 of earnings. This ratio, abbreviated P/E, appears in The Wall Street Journal stock listings.

P/E = Market price per share

Earning per share

$$\textbf{P/E} = \frac{16.66}{11} = \textbf{1.5}$$

B) Dividend yield

Dividend yield is the ratio of dividends per share to the stock's market price per share. This ratio measures the percentage of a stock's market value that is returned annually as dividends. Preferred stockholders, who invest primarily to receive dividends, pay special attention to dividend yield.

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

$$\textbf{Dividend Yield} = \frac{3.67}{16.66} = \textbf{0.22}$$

This implied that for every birr sale of stock .22 birr returned annually as dividend.

C) Market to Book value

Book value per share of common stock is common equity divided by the number of common shares outstanding. Common equity equals total stockholders' equity less preferred equity. Many experts argue that book value is not useful for investment analysis. It bears no relationship to market value and provides little information beyond stockholders' equity reported on the balance sheet. But some investors base their investment decisions on book value. For example, some investors rank stocks on the basis of the ratio of market price to book value. To these investors, the lower the ratio, is the more attractive the stock.

$$\textbf{Market to Book value} = \frac{\text{Market price per share}}{\text{Book value per Share}}$$

$$\textbf{Market to Book value} = \frac{16.66}{12} = \textbf{1.40}$$

This indicated that each birr sales of company stock exceed its par value by 40 cents and the investors are entitle to enjoy it if they decided to sale their shares in the stock market.

USE AND LIMITATIONS OF RATION ANALYSIS

- Ratio analysis is used by three main groups of users:
  - Managers, who employ ratios to help analyze, control and thus improve their firm's operations.
  - Credit analysts, including bank loan officers and bond rating analysts, who analyze ratios to help ascertain a company's ability to pay its debts.
  - Stock analysts, who are interested in a company's efficiency risk and growth prospects.
- Although ratio analysis provides useful information to these users so that they make sound economic decision, it does have limitations that necessitate care and judgment. These are:
  - Many large firms operate different division in different industries, and for such companies it is difficult to develop a meaningful set of industry averages. Therefore, ratio analysis is more useful for small, narrowly focused, firms than for large, multidivisional ones.

- Most firms want to be better than average, so merely meeting (attaining) average performance is not necessarily good. As a target for high level of performance, it is best to focus on industry leaders' ration. Bench marking helps in this regard.
- Inflation may have badly distorted firms' balance sheet recorded values are often substantially different from true values.
- Seasonal factors can also distort a ratio analysis.
- Firms can employ "window dressing" techniques to make their financial statements look good.
- Different accounting practices can distort comparisons. For example inventory valuation and depreciation method used can affect financial statements and thus distort comparisons among firms.
- It is difficult to recognize about whether a particular ratio is good or bad. For example a high current ratio may indicate a strong liquidity position, which is good or excessive cash, which is bad.
- A firm may have some ratios that look "good" and others that look "bad" making difficult to tell whether the company is on balance strong or weak.

CHAPTER THREE
FINANCIAL FORECASTING

A lack of effective planning is a commonly cited reason for financial distress and failure. Planning is a means of systematically thinking about the future and anticipating possible problems before they arrive. Financial planning forces the corporation to think about goals. Financial planning formulates the way in which financial goals are to be achieved. A financial plan is thus a statement of what is to be done in the future. Every resource allocation decision embodies a forecast of future. These forecasts mainly fall under two broader classifications, namely, short run and long run forecasts. Short run forecasts time span coverage is usually one year or less while long term forecasts are seeing several years into the future.

Financial planning, usually the term is related to long term, indicates a firm's growth, performance, investment and requirement of funds (which includes Internal and External Financing) during a given period of time, usually three to five years. Most financial planning models require the user to specify some assumptions about the future. Based on those assumptions, the model generates predicted values for a large number of variables. Almost all financial plans require an externally supplied sales forecast. A financial plan will have a forecasted balance sheet, income statement, and statement of cash flows. These are called pro forma statements, which are the output from the financial planning model.

BASIC STEPS IN FINANCIAL PLANNING

A financial plan is a serious of continuous actions or process which can be broken down into the following basic ingredients:

1. **Forecast sales**

In order to develop financial plan, we will start with a forecast of what drives much of our financial activity; namely sales. Therefore, the first forecast we will prepare is the Sales Forecast. In order to estimate sales, we will look at past sales histories and various factors that influence sales. For example, marketing research may reveal that future sales are expected to stabilize.

May be we cannot meet growing sales because of limited production capacities or maybe there will be a general economic slow down resulting in falling sales. Considerations also must be given to marketing efforts to be done, credit policy etc. Therefore, we need to look at several factors in arriving at our sales forecast.

After we have collected and analyzed all of the relevant information, we can estimate sales volumes for the planning period. It is very important that we arrive at a good estimate since this estimate will be used for several other estimates in our budgets. The Sales Forecast has to take into account what we expect to sell at what sales price. Most of the time it will be given as the growth rate in sales rather than explicit sales figure.

2. **Prepare a pro forma statements**

These statements then serve as means of measuring the effect of operating plans on projected profits and other financial ratios. It also serves as a means of standard from which deviations are to be calculated for control purpose. The basic statements usually prepared are: forecasted balance sheet, income statement and statement of cash flow.

3. **Determine the funds needed to support the plan**

In this part funds required are spelt out. It will contain changes in total fixed asset as well as working capital.

4. **Forecast fund availability during a planning period**

Here estimate has to be made about both external financing and internal. Any restrictions placed either by existing stockholders or external providers are also to be included. Stockholder with fear of ownership dilution might restrict not to issue additional stock security or debt holders might enforce through debt covenant not to borrow additional money till they settle theirs.

5. **Establishing system of control**.

This is to make sure that plans are going as desired.

6. **Develop adjustment when the economic forecasts change**.

Effective plan has to explicitly state the economic environment in which the firm expects to reside over the life of the plan. Most important figures are like interest rate and income tax rates. This is a feed back loop, which might initiate a modification to financial plan.

7. **Base management compensation on performance of the business.**

FINANCIAL STATEMENT FORECASTING:

I) THE PERCENTAGE OF SALES APPROACH

The basic idea of this method helps to determine income statement and balance sheet items that vary with sales. The goal of this method is to develop a quick and practical way of generating pro forma statements. Pro forma statements serve as important planning and control functions.

The pro forma income statement is a forecast of a company's sales, expenses and profits over the planning period. If the estimated profits are below corporate goals, then the changes in various aspects of the firm's operations may be necessary in order to produce an acceptable level of profits. The pro forma balance sheet forecasts the dollar amounts of a company's capital at the end of the planning period. One important contribution made by this statement is the estimate in the increased or decreased sources of funds required to meet the proposed financial plans.

A series of operating forecasts in various department of the business will be used by financial managers to develop a cash forecast and the pro forma F/S that are identified specifically with the finance function.

The three major short-term financial plans or forecasts are:

1. The Cash Forecast (often called the cash budget or cash flow forecast)
2. The Pro Forma Income Statement
3. The Pro Forma Balance Sheet

Pro forma F/S simply means the forecast or estimate of what the statement will be in the future, such as the Income Statement for given future months or the coming year, and the balance sheet at the end of those periods.

1. The Cash Forecast/ Cash Budget

The cash forecast is the estimate of what will happen to the firm's cash account as a result of planned activities. It uses to forecast the cash inflows from operations and non-operating activities and the uses of cash for these purposes. It is, simply, a forecast of a firm's cash inflows and outflows over a designated planning period. It helps identify periods of cash surpluses, as well as periods during which additional financing will be needed.

- **The preparation of cash budget is divided into four steps:**

1. Forecasting sales
2. Estimating cash inflows
3. Estimating cash outflows
4. Estimating end of month cash and loan balances

- **Sales forecast**: -Estimates of cash inflows and outflows are based primarily on sales forecasts. This sales forecast could be made using either internally or externally obtained information. Frequently, the sales forecast will be given as the growth rate in sales rather than an explicit sales figure. These two approaches are essentially the same because we can calculate projected sales once we know the growth rate.

❖ The **Cash Inflow** section of the cash budget includes two types of cash inflows:

1. Receipt on cash and credit sales; and
2. Other cash inflows not tied directly to sales.

Each type of cash inflow is computed separately. Cash sales occur when payment by check or currency is made at the time of purchase. These sales are recorded as cash inflow in the month when the sales are made.

The accounts receivable generated from credit sales are recorded as cash inflows in the months when the receivables are collected. In addition to cash inflows generated from sales, other cash inflows can occur during the planning period. Examples of cash inflows not directly related to sales include tax refunds; proceed from sale of marketable securities, and proceeds from the sale of other assets.

- The **Cash Outflow** portion of the cash budget includes five types of payments:
  1. Payments for purchases
  2. Payments for salaries and wages
  3. Payments for other operating costs
  4. tax payments
  5. Other payments.

- ✓ **Each type of payment is estimated separately.**

Payments for purchases:- purchases are often made on credit basis, thus creating accounts payable. Purchase payments are recorded as cash outflows in the months when payments are made by cash or check. When estimating purchase payments on the basis of sales forecast, it is necessary to estimate the percentage that purchases are contained in each dollar of sale. Previous year income statements can be a good first estimate of this. This is done by taking the purchases contained in the cost of goods sold and dividing it by net sales. This percentage is then multiplied by the sales forecast in order to estimate the required purchase payment.

Payments for salaries and wages:- these are recognized as cash out flows in the month they are paid to employees. A firm typically incurs a minimum amount of payroll expense that is independent of sales volume. Once the sales volume exceeds a minimum amount, wages and salaries tend to increase proportionally with sales.

Other payments:- there are several types of cash outflows that are not directly related to sales. These include dividend payments, payments for the purchase of real estate, property, plant and equipment, and the payments of principal and interest on long term debt.

Computing cash and loan balances: -

To compute cash balances, total cash inflows and outflows are combined with (1) the estimate of cash on hand at the start of the period and (2) the minimum cash balance desired at the end of each month. Setting minimum cash balance is one way of allowing for the forecasting errors that occur in the cash budget estimate.

To compute loan balances, the loan and repayment schedule for each month must contain the following:

1. ***The amount borrowed:-*** this will be determined by comparing the net cash available with the minimum cash balance required. If the net cash is more than the minimum amount no loan is needed. On the other hand if the net cash is lower than the minimum cash balance additional financing (loan) is needed.
2. ***The interest cost***: this will be included in the cash budget in the month it will be paid.
3. ***The maximum loan size***- the maximum value of unpaid principal and interest that occurs in each month. It is computed by adding the following items:(a) the amount borrowed during the month (b) the loan interest (c)the end of month loan from the previous month.
4. ***The amount of loan repaid during the month***. Loan will be repaid if there is positive net cash that exceeded the minimum cash balance for the month.
5. ***The end of month loan size***

FUND FLOW ANALYSIS

The beginning and ending balance of the items of a b/s are given below:

	1-1- 00	31-12-00
Cash	25,000	45,000
Marketable securities	-	15,000
A/R	12,000	20,000
Inventory	18,000	14,000
Plant and Equipment	30,000	21,000
Allowance for depreciation	5,000	10,000
Total	**80,000**	**105,000**
A/P	14,000	-
N/P	11,000	6,000
Accruals	5,000	18,000
Income tax payable	4,000	2,000
Mortgage bonds	10,000	30,000
Common stock	31,000	44,000
R.E	5,000	5,000
Total	**80,000**	**105,000**

Prepare the Sources and Uses of Funds Statement for the moth ended 31-12-2000

Solution

Sources and Uses of Funds Statement
For the moth ended 31-12-2000

Sources		Uses	
↓ In Inventory	4,000	↑ In Cash	20,000
↓ In Plant and Equipment	9,000	↑ In Marketable Security	15,000
↑ In Allowance for Depreciation	5,000	↑ In A/R	8,000
↑ In Accruals	13,000	↓ In Liability (A/P)	14,000
↑ In Bones	20,000	↓ In N/P	5,000
↑ In Common Stock	13,000	↓ In Income Tax Pay.	2,000
Total Source	**64,000**	**Total Use**	**64,000**

2. The Pro-Forma Income Statement

The pro forma Income Statement is a forecast of income statement for the planning period. The pro forma I/S will provide a projection of how much profit the firm anticipate making over the ensuing time period. It could be prepared by using information that is in the operating budgets, specifically sales forecast, production forecast, and different administrative and selling expenses forecasts. A variation of this approach is the percent of sales method, which relies on previous Income Statement to identify items that vary proportionately with sales. This method can generate pro forma Income Statement in very little time, so it is especially useful in forecasting the impact of alternative or what-if situations such as changes in sales, product lines or operating costs.

♠ **To prepare a pro forma Income Statement using the percent of sales method, the following information is needed:**

1. Sales forecast for the year in question
2. Identification of those Income Statement items that vary proportionately with sales

3. Estimates for those items that do not vary with sales; and
4. The dividend policy for the year in question

3. Pro Forma Balance Sheet

After developing a cash budget and a PFIS, a Pro forma B/S should be developed by integrating the items of I/s and cash budget. Because the b/s represents cumulative changes in the corporation over time, the prior period's b/s should be examined and the items have to be translated to present the future period.

If a cash budget has been prepared, it may provide some of the data needed to prepare Pro forma Balance Sheet. An alternative approach, however, is to identify those Balance Sheet accounts, the values of which are proportional to sales. Many current assets and current liabilities fall into this category although there may be times when this relationship does not hold.

Those Balance Sheet accounts, such as common stocks, with values that are not proportional to sales are estimated separately. In preparing a pro forma Balance Sheet, the long-term financing accounts are assumed constant; the exceptions are Retained earnings and whatever changes, such as bond repayments that are scheduled to occur. Holding these accounts constant allows the firm to estimate the amount, if any, of additional financing that is needed.

⇒ **To prepare a pro forma Balance Sheet**, the following information is required:

1. The preceding year Balance Sheet
2. Sales forecast for the year in question
3. Identification of those items that vary directly with sales
4. Estimates of those items that are independent of sales
5. An estimate of the change in Retained earnings. Retained earnings are expected to increase by the amount of the addition to retained earnings estimated in the pro forma income statement.

In the pro forma balance sheet value of total assets must equal the value for total liabilities and equity. If the value of total assets is greater than the sum of the forecasted liabilities and equity, this means additional financing is needed. And this balance is shown, as additional financing needed in the pro forma balance sheet. On the other hand, if the value for total assets is smaller than the sum of the forecast liability and equity, this means that surplus resources are forecasted and that the firm will be able to reduce its liabilities by the amount by which sources exceed uses.

- **Evaluation of pro forma statements**

1. Advantages of pro forma statements

a) They make explicit forecasts of such items as profit, dividends, and financing needs.
b) By comparing the actual and the pro forma statements at the end of the planning period, corporate managers can evaluate the extent to which corporate goals were attained. They can also isolate those aspects of performance that deviated significantly from corporate plans.

2. Limitation of pro forma statements

a) A sales forecast is needed to prepare the pro forma Income Statement. Many of the expense items are assumed to vary directly with sales, and historical relation ships are often used in estimating the separate Income Statement accounts. If these relationships are expected to change during the planning period, the pro forma Income Statement will not produce useful results unless the new relationships are correctly forecast.
b) Similarly many pro forma Balance Sheet accounts, especially CA & CL, are based on forecast sales. The balance account (negative or positive) that is estimated in the pro forma Balance Sheet is a forecast for the end of the planning period. However, the amount of financing needed during the planning period, if any, can differ significantly from the end of period forecast.

II) THE FORMULA METHOD

To determine the external fund needed using the formula the following steps should be performed:

1. Isolate all balance sheet items which have a direct relation with sales
2. Express all identified items as percent of sales

3. Obtain projected sales value
4. Determine the external fund required as the balancing item using the following formula: -

$$EFR = (A / S \times \Delta Sales) - (L / S \times \Delta Sales) - (PM \times FS \times (1 - d))$$

Where:

EFR=External Financing Required

A = percentage of assets that change in response to the change in sales to sales

S

L = percentage of liabilities that change in response to the change in sales to sales

S

ΔS= change in sales

PM= profit margin

FS = Forecasted Sales

d = the dividend payout ratio.

(1 - d) = Percent of earnings retained after paying out dividends;

⇒ **Assumptions of the formula:**

1. Each assets must grow at the same rate as sales,
2. Spontaneous liability accounts grow also the same rate with assets, and
3. Profit margin and dividend payout ratios are constant.

Σ When does constant ratio method fails?

A. **Economic of scale**: it is when a firm does have advantage over size. In this cases then relation ship between items would become non-linear.

B. **Lumpy assets**: These are productive assets, which increase or decrease in their production capacity in large quantum and therefore resulting non-linear relationship.

C. **Non-optimal starting ratios**: this is an interval in which a certain level of increase in sales is possible without any increase in the corresponding inputs because the previously forecasted sales level is not reached.

D. **Excess capacity adjustment**: this is adjusting for unutilized or untapped assets at hand to the projected amount of sales.

Assumptions for Cash Budget for the year 2016 I-IV Quarters

GIVEN

1. Sales of the last quarter of 2015, 50,000 would increase by 20% each quarter of 2016
2. Of the total sales 20% are on cash.
3. The collection pattern is as follows:

   In the quarter incurred 20%
   In the second quarter 50%
   In the third quarter 30%
4. Administrative expenses will be 10% of the total sales of each quarter.
5. Rent expense is 2000 each for the first two quarters and 3000 each for the last two quarters.
6. Wages are estimated at 4000, 5000, 6000 and 6000 respectively for the four quarters.
7. Accrued expenses of the first two quarters of 2016 which are 2,000 and 3,000 will be paid in the third and fourth quarters respectively.
8. There was an accrued expense of the last quarter of 2015 Birr 2,000, 25% of which is paid in the first quarter of 2016.
9. Total purchases amount to 60% of the total sales.

10. Of the total purchases, 60% are on credit, 50% of which is paid in the quarter in which the purchase was made and the remaining in the next quarter.
11. Annual selling expenses amount to 2,000 which will be paid evenly at the end of every quarter.
12. A part of the fixed assets will be sold for 15,000 in the second quarter.
13. Other income will amount to 8,000 in the first quarter and 10,000 in the third quarter.
14. A cash balance of 5000 will be maintained.
15. Beginning cash balance, 5000
16. CBE allows the firm to borrow money if required and to pay the loan and interest at the end of the next quarter. (Interest rate is 10%).

SOLUTION

Schedule of Cash Receipts
For the year 2016

	I-Quarter	II-Quarter	III-Quarter	IV-Quarter
Total sales	60,000	72,000	86,400	103,680
Credit sales	48,000	57,600	69,120	82,944
Collection of A/R:				
= of 2015 (50% of Cr. sales)	20,000	12,000	-	-
= of I Quarter of 2016	9,600	24,000	14,400	-
= of II Quarter of 2016	-	11,520	28,800	17,280
= of III Quarter of 2016	-	-	13,824	34,560
= of IV Quarter of 2016	-	-	-	16,589
Total collection of A/R	29,600	47,520	57,024	68,429
Cash sales	12,000	14,400	17,280	20,736
Sales of Equipment	-	15,000	-	-
Other Income	8,000	---	10,000	---
Total Receipt	**49,600**	**76,920**	**84,304**	**89,165**

Schedule of Cash Payment
For the year 2016

	I-Quarter	II-Quarter	III-Quarter	IV-Quarter
Total purchase	36,000	43,200	51,840	62,208
Credit purchase	21,600	25,920	31,104	37,325
Payment of A/P				
= Payment of IV Q of 2015	9,000	-	-	-
= of I Q of 2016	10,800	10,800	-	-
= of II Q of 2016	-	12,960	12,960	-
= of III of 2016	-	-	15,552	15,552
= of IV of 2016	-	-	-	18,663
Total payment of A/P	19,800	23,760	28,512	34215
Cash purchases	14,400	17,280	20,736	24883
Administrative exp (10% of total sales)	6,000	7,200	8,640	10368
Rent expense	2,000	2,000	3,000	3000
Wages	4,000	5,000	6,000	6000
Payment of accrued exp.	-	-	2,000	3000
Payment of accrued exp of 2015	500	-	-	-

Selling expense	500	500	500	500
Total cash payments	47,200	55,740	69,388	81,966

Cash Budget
For the year 2016

	I-Quarter	II-Quarter	III-Quarter	IV-Quarter
Beg. Balance	5,000	7,400	28,580	43,496
Total Receipt	49,600	76,920	84,304	89,165
Total cash available for use	54,600	84,320	112,884	132,661
Payments	47,200	55,744	69,388	81,966
Minimum cash bal. required	5,000	5,000	5,000	5,000
Total cash required	52,200	60,740	74,388	86,966
Cash surplus/deficit	2,400	23,580	38,496	45,695
Financing :	-	-	-	-
Borrowing	-	-	-	-
Repayment	-	-	-	-
Interest	-	-	-	-
Effect of financing	-	-	-	-
Ending cash	**7,400**	**28,580**	**43,496**	**50,695**

GIVEN

Balance Sheet

The Balance Sheet of East Africa Ltd. for the year ended 2016 is shown below:

Assets

Current Assets

Cash	10000	
N/R	15000	
A/R	20000	
Inventory	12000	
Total current assets		57000

Non Curent Assets

Gross PPE's	25000	
Less Accumulated Depn	5000	
Net PPE's	20000	

Total Assets **77000**

Liabilities

Current Liabilities

A/c payable	6000	
Note payable	8000	
Accrued Liabilities	5000	
Total CL		19000
Non Current Liabilities		
Long- term debt		11000
Total Liabilities		30000

Stockholders' Equity

Common Stock	30000	
Retained Earnings	17000	
Total SHE		47000
Total Liabilities and SHE		**77000**

Additional information

1. Securities of 2015 will be purchased during the year.
2. Long term liabilities remain unchanged.
3. The schedule of Receipts shows an ending balance of A/R, 25000.
4. Notes receivable will be paid to the extent of 10000.
5. Minimum cash balance maintained is 15000.
6. Ending inventory according to the income statement is 20000.
7. Fixed asset was additionally purchased at 15000. Annual Depreciation charged on all fixed assets is 5000
8. The schedule of payments shows an ending balance of A/P, 8000.
9. Note payable is estimated to have an ending balance of 14000.
10. Fifty percent of the accrued liabilities will be paid during the year.
11. Marketable Additional shares will be issued to the extent of Birr 10500.
12. Net income for the year 2016 is estimated at 12000, 2/3 of which will be distributed to the share holders

SOLUTION

East Africa Ltd
Balance Sheet
For the year ended 31-12-2016

Assets		**Liabilities**	
Non Current Asset:		**Current Liabilities:**	
PPE's	40,000	Long Term Liabilities	11,000
Less Accounting Depreciation	10,000	N/P	14,000
Net PPE's	30,000	Accrued Liabilities	2,500
Current Assets:		A/P	8,000
Inventory	20,000	Total Current Liabilities	24,500

N/R	5,000	Total Liabilities	35,500
A/R	25,000	**SHE**	
Marketable Securities	2,000	Common Stock	40,500
Cash	15,000	Retained Earnings	21,000
Total current asset	67,000	Total SHE	61,500
Total assets	**97,000**	**Total L. and SHE**	**97,000**

PERCENT OF SALES METHOD

Under this method the assumption is that a constant r/p exists between sales and the items on the I/S and the B/S. Thus, we indicate a change in the sales level and ascertain our released financing needs.

➢ Pro forma Income Statement (in percent of sales method)

Pro forma Income Statement
For the year ended:

	2015	% of sales	2016
Revenues:			
Net sales	50,000	100%	**80,000**
Other income	10,000	20%	**16,000**
Total income	60,000		**96,000**
Cost and Expenses:			
COGS	15,000	30%	**24,000**
Administrative Exp.	20,000	40%	**32,000**
Total cost and expense	35,000		**56,000**
Earnings from operations	25,000		**40,000**
Interest expense	5,000	10%	**8,000**
EBT (Earning Before Tax)	20,000		**32,000**
Tax	12,000	24%	**19,200**
N/I	8,000		**12,800**

- **Sales of 2016 are estimated at Birr 80,000**

➢ Pro forma Balance Sheet /PFBS (In Percent of Sales Method)

A PFBS shows the approximate composition of projected assets and liabilities as well as the external funds they must be raised to support the growth in sales. The percent of sales method assumes that selected b/s items released to operation vary directly with sales. They are called **Responsive Items**. The d/c between responsive assets and responsive liabilities plus SHE is the external/additional fund required. The responsive liabilities that increase automatically are called **Spontaneous Liabilities**. Example: Account Payable

BALANCE SHEET

	31-12-15	% of sales	31-12-16
Assets			
Net fixed assets	25,000	50%	**40,000**
Prepaid expense	8,000	NA	**8,000**
Inventories	15,000	30%	**24,000**
A/R	20,000	40%	**32,000**
Cash	6,000	12%	**9,600**
Total Assets	**74,000**	**132%**	**113,600**
Liabilities			
L.T liabilities	14,000	NA	**14,000**
N/P	12,000	NA	**12,000**
Accrued liabilities	8,000	16%	**12,800**
A/P	16,000	32%	**25,600**
L.T liabilities	14,000	NA	**14,000**
Total liabilities	50,000	48%	**64,400**
SHE			
Common stock	18,000	NA	**18,000**
R/E	6,000	NA	**6,000**
Total SHE	24,000		**24,000**
Total liabilities and SHE	**74.000**		**88,400**

- Assume that the sale of 2015 is 50,000 and that of 2016 is 80,000, and Dividend declared and paid for the year 2002 is 4,800.

♠NA = Not Applicable.

✈ Total Assets (total fund required) 113,600
Total L+C (total fund available) 88,400
Total additional fund required 25,200
Internal fund available (N/I) 8,000
⇒ **Additional external fund required** **17,200**

FORMULA METHOD

A) Internal Fund Available(IFA) (Change in Retained Earnings/CIRE)

IFA = mbs_2

Where: m= profit margin
b = Retention rate
S_2 = sales of the 2nd period

Change in Retained Earnings
R/E of the projected year - RE of base year, or
N/I of base year - dividend of base year

Profit margin (m) = N.I / Sales
= 12,800 = **0.16**
80,000

Retention rate (b) = amount retained **OR** N.I of Base Yr.
N.I N.I of the ff Yr.
= 8,000 = **0.625**
12,800

Sales of the 2nd period (S_2) = **80,000**

IFA (CIRE) = mbs_2
= 1.6 x 0.625 x 80,000
= **8,000**

B) AFN Formula (Additional Fund Needed)

AFN= $\sum \frac{RA}{S}$ (CS) – $\sum \frac{RL}{S}$ (CS)
(66,000 x 30,000) – (24,000 x 30,000)
50,000 50,000
1.32 (30,000) – 0.48 (30,000)
39,600 – 14,400
= 25,200

Where: RA=Responsive Asset
S= Sales of the Base year
CS= Change on Sales
RL= Responsive Liabilities

C)Total External Fund Needed (EFN) = AFN - IFA
= $\sum \frac{RA}{S}$ (CS) - $\sum \frac{RL}{S}$ (CS) – mbs_2
⇒ 66,000 (30,000) – 24,000 (30,000)- (0.16x0.625x80,000)
50,000 50,000
= 39600 – 14400 – 8,000 = **17,200**

OREFN = AFN – IFA (25,200 - 8,000 = **17,200**)

OR

AFN =

Percent of sales of total assets	132
Percent of sales of total Liabilities	48
Percent of fund required for additional sales	84%
Additional sales (increase in sale)	= 30,000
Additional Fund Needed = 84% of 30,000	= **25,200**

CHAPTER-IV

TIME VALUE OF MONEY AND VALUATION OF FINANCIAL ASSETS

4.1 Time Value of Money

Ignoring the effects of inflation, a dollar to day is worth more than a dollar to be received a year from now. In other words, we would all prefer to receive a specific amount of money now rather than some future date. This preference rests on the time value of money. The term interest is used to describe the price charged for using money over time. When payments for the time value of money are made or accrued, interest expense is incurred. When payments for time value of money are received or accrued, interest revenue is realized. Business decisions often involve receiving cash or other assets now in exchange for a promise to make payments after one or more periods.

Time value of money refers to the fact that a dollar in hand today is worth more than a dollar promised at some time in the future. One reason for this is that you could invest the money received today and earn interest while you waited; so a dollar today would grow to more than a dollar later. The trade off between money now and money later thus depends on, among other things, the rate you can earn by investing. This is the interest on your money which is the price paid for the use of money over time.

- **Future Value and Compounding**

Future value refers to the amount of money an investment will grow to over some period of time at some given interest rate. It is the cash value of an investment at some time in the future. There are two ways of depositing payments into an interest bearing account. These are Single Payments and a Series of Payments.

Compounding Single Payments:

When given money is deposited in an interest–bearing account and is allowed to earn interest for a length of time, the resulting dollar value of the deposit account is called the **compound amount.** The original deposit is referred to as the **principal.** This process of leaving your money and any accumulated interest in an investment for more than one period, thereby reinvesting the interest, is called **compounding**. Compounding the interest means earning **interest on interest** so we call the result compound interest. With **simple interest**, the interest is not reinvested, so interest is earned each period only on the principal.

The basic equation: - four variables are involved when dealing with compound amount single payment problems. These variables are;

P_O = principal at time zero

i = the annual rate of interest

t = the number of years over which the principal earns compound interest

A_t = the compound amount after t years

⇒ **The compound amount A_t which results from depositing P_o dollars in an account that earns i percent over 't' years is given as;**

$A_1 = Po\ (1 + i)$ End of 1st period

$A_2 = [Po\ (1 + i)]\ (1 + i) = P\ (1 + i)^2$ End of 2nd period

$A_3 = [Po\ (1 + i)^2]\ (1 + i) = P\ (1 + i)^3$ End of 3rd period

.

.

$A_t = [P_o\ (1+ i)^{t-1}]\ (1+ i) = P\ (1+ i)^t$ End of nth period

Thus, the general formula is:

$$A_t = p_o(1+i)^t \qquad A_t = P_0(FVIF_{i,n})$$

Or, using table:

Where, [FVIF] = $(1+i)^t$ Future Value Interest Factor

Example-1

Find the value of $10,000 earning 5% interest per year after **two** years using:

a) Simple interest

b) Compound interest

Example-2

If on the day her daughter was born, Mary deposited $10,000 in Saving Account that guarantees to accumulate interest quarterly at 10% a year. What will be the amount in the Savings Account on her daughter's 18th birthday?

Example- 3

Ato Abera deposited $ 10,000 in a fund that will earn interest at 8% compounded quarterly for the first four years, and 10% interest compounded semi annually for the next 6 years. How much will Abera have in the fund at the end of 10 years?

- The basic single payment equation can also be used to find interest rates, as well as the number of years that will be needed for the compound amount to equal the desired value. In general, if the values of any three of the variables are known we can find the fourth by solving the equation for the unknown variable.

4.2 SOLVING THE OTHER UNKNOWN VARIABLES

A) Computing Interest Rate

Example 1:

You borrowed $1,584 and must repay $2,000 in exactly 4 years from today. Interest is compounded annually. What is the interest rate of the loan?

B) Computing Number of Periods:

Example 2:

If you can buy a security with a 5 percent interest rate at a price of $78.35 today, how long will it take for your investment to return $100?

4.3 COMPOUNDING PERIODS

Up to this point, we have used years as the only time period (compounding period). Actually, all the previous examples could have been quarters, months, or days.

- **Illustration:**

Case1

Find the value of $10,000 earning 5% interest per year after two years.

Case2

Find the value of $10,000 earning 5% interest per quarter after two quarters.

⇒ Both cases have same answer:

$10,000 x $(1.05)^2$ = **$11,025**

However:

In the first case '**t**' refers to years and '**i**' refer to interest rate per year.

In the second case '**t**' refers to quarters and '**i**' to interest rate per quarter.

- **Example:**

What will $1,000 be worth at the end of one year when the annual interest rate is 12% when interest is compounded?

a) Annually
b) Quarterly
c) Monthly
d) Daily

4.4 COMPOUNDING ANNUITIES

An annuity is a series of equal payments made at fixed intervals for a specified number of periods. If the payments occur at the end of each period, as they typically do, the annuity is an ordinary annuity. If the payments occur at the beginning of each period, it is called an annuity due. Monthly mortgage payments and semiannual bond interest payments are examples of annuity.

- **Conditions for Annuity**:

1. Payment should be constant(equal)
2. Time between payments should be constant
3. Interest rate has to be constant
4. Interest should be compounded at the end of each period

⇒ **Ordinary Annuity**

In general, the future value factor for an ordinary annuity is given by:

$$FV_t = C + C(1 + r) + C(1+r)^2 + - - - + C(1 + r)^{t-1}$$

And proceeding from the above equation, we obtain the general formula for the future value of an ordinary annuity.

$$FV_t = C\left(\frac{(1+r)^t-1}{r}\right) \quad \underline{\textbf{OR}} \quad R\left(\frac{(1+i)^n-1}{i}\right)$$

Where;

FV_t = future value at time t

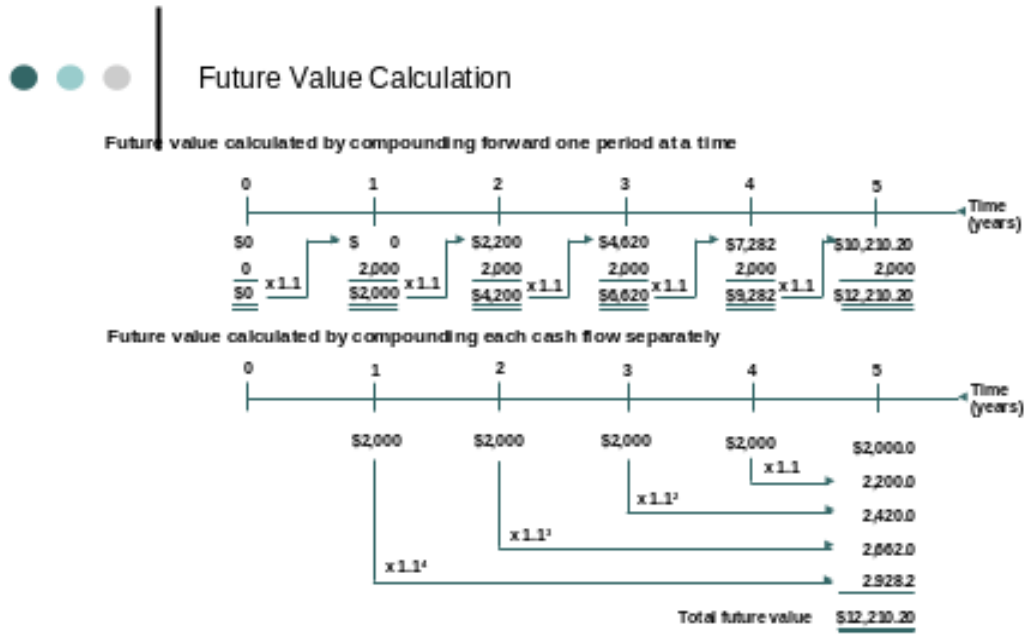
r = the interest rate

t = the number of period the annuity payments will be made

C= the amount of annuity cash flow

Example 1

If you deposit $2,000 at the end of every year for five years in account that pays 10% interest per annum. What would be your balance immediately after making the last payment?



♠ There is also annuity table that assumes annuity payments of 1 dollar and computes compounded amounts of the annuity for combinations of payments and interest rates.

❖ When the values of any three variables are given, the value of the fourth variable can be determined by algebraic manipulation of the future value annuity formula.

Example 2

Batu Company wants to accumulate $600,000 on Dec. 31 Year 5 to retire a long-term note payable. It intends to make five equal annual deposits in the fund that will earn interest at 6% compounded annually. The first deposit is made on Dec. 31, Yr. 1. Compute the amount of the periodic deposits that the company must make and prepare a fund accumulation table.

❖ **Batu Company Fund Accumulation Table**

Dec. 31

Year	Annual Deposit	Interest at 6%	Increase in fund bal.	Fund Balance
1	$106,438	-	$106,438	$106,438
2	106,438	$6,386	112,824	219,262
3	106,438	13,156	119,594	338,856
4	106,438	20,331	126,769	465,625
5	106,438	27,937	134,375	600,000

4.5 PRESENT VALUE AND DISCOUNTING

Up to now we dealt with future values or compound amounts of single payments and annuities. Of equal importance to business and finance is the problem of determining the time value at time zero of a future payments or a series of payments.

The present value of a future payments or series of payments is the dollar value at year zero of the future payment or payments adjusted for the time value of money. Discounting is the term given to the set of techniques used to compute present values. Present values can be calculated for future single payments or future annuities.

- The basic equation for computing present value of a single payment is:

$$P_o = A_t [1/ (1+i)^t]$$

Where;

A_t = the payment that occurs t years from now

i = the interest rate

t = the number of period the annuity payments will be made

P_o = the present value of the future payment, discounted at **r** percent interest rate per year over **t** periods.

The expression, $1/ (1+i)^t$, is called the present value interest factor and there is a table that calculate this factor at **r** rate for **t** periods.

Therefore,

$P_o = A_t \ (PVIF_{i,t})$.

Where, $PVIF_{i,t}$ is the present value interest factor.

Calculating the present value of a future cash flow to determine its worth today is commonly called discounted cash flow analysis.

Example 1: How much do I need to invest at 8% per year, in order to have $10,000 in_____?

a) One year

b) Two years

c) Ten years

- As with the future value calculations, simple algebraic manipulation allows the above equation to be solved for any one variable when the other three variables are known.

Example 2:

Ali wants to deposit cash in a Saving Account at the beginning of year 1 so that he will have $50,000 at the end of Year 6. How much must Ali deposit at the beginning of Year 1 if interest rate

is 6% compounded semi-annually for the first three years and 8% compounded quarterly for the next three years.

♠ **NOTE**

- ✓ The higher the rate of interest, the larger the future amount
- ✓ The higher the rate of interest, the smaller the present value
- ✓ The longer the time period 'n' the smaller is the present value of any future amount.

4.6 DISCOUNTING ANNUITIES

Some of the most frequent applications of the time value of money involve computing present values for annuities.

Determining loan repayment schedules, computing bond prices, and evaluating leasing alternatives are typical examples. Because the cash flows of an annuity are all the same, we can come up with a very useful variation on the basic present value equation. It turns out that the present value of an annuity of c dollars per period for **t** periods when the rate of return or interest rate **r** is given by:

$$Po = C(1 + r)^{-1} + C(1 + r)^{-2} + - - - + C(1 + r)^{-t}$$

Proceeding from the above equation, we obtain the general formula for the present value of an ordinary annuity.

$$P = C\left(\frac{1-(1+r)^{-t}}{r}\right) \quad \textbf{OR} \quad R\left(\frac{1-(1+i)^{-n}}{i}\right)$$

Where;

Po= Present value

r = the interest rate

t = the number of period the annuity payments will be made

C= the amount of annuity cash flow

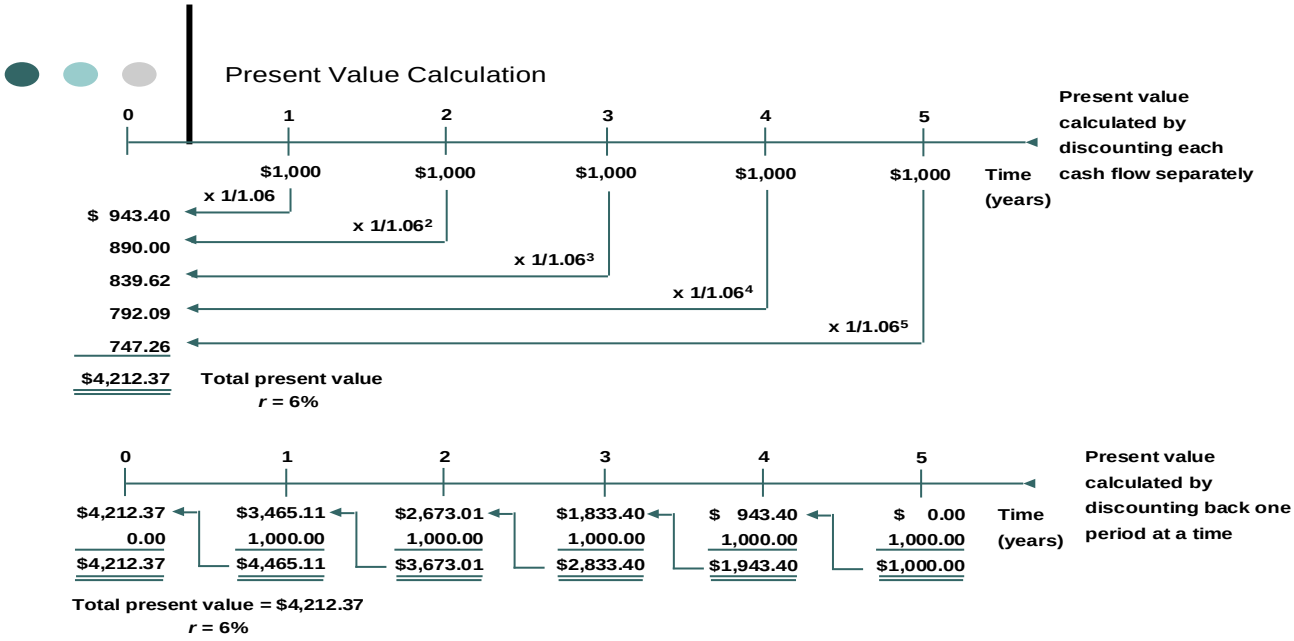
There is also a table for this present value interest factor annuity.

Annuity present value= C * [(1-present value factor)/r]

Example 1

What is the present value of a 5-year annuity, if the annual interest is 6%, and the annual payment is $1,000?

Solution



4.7 SOLVING THE OTHER UNKNOWN VARIABLES

- **Computing Interest Rate**

Example 1 You borrow $60,000 and repay in 8 equal annual installments of $12,935 with the first payment made exactly 1 year later. To the nearest percent, what rate of interest are you paying on your loan?

Solution

In order to solve this problem we use a **trial and error method** (linear interpolation.)

Given

r =? PV = $60,000 C=$12,935 t = 8 years

Steps

Select an interest rate arbitrarily, (say 12%)

Using the interest rate determine PV

$$\textbf{PV = 12,935 (} \frac{1-(1+0.12)^{-8}}{0.12} \textbf{) = 64,256.42}$$

The above Pv is greater than the given one, therefore the interest rate should be grater than 12%.

Thus, try 15%

$$\text{PV = 12,935 (} \frac{1-(1+0.15)^{-8}}{0.15} \text{) = } \textbf{58,043.5}$$

- ✓ **This PV is smaller than the given one; therefore the interest rate should be between 12% and 15%**

I. Determine the difference between the Present value at 12% & 15%:(64,256.42 – 58043.5= 6,212.92)
II. Determine the difference between the given value (60,000) and the value with the lower ***r***:(64,256.42 - 60,000 = 4,256.42)
III. Determine the percentage distance across the discount range rates,12-15percent, i.e. divide the value from *step II* by the value in *step I*: (4,256.42 ÷ 6,212.92 = 0.6851)

IV. Multiply the percent by the interval width of 3 percent (15%-12%) :(0.6851 X 3% = 2%
V. Add the value in step IV to the interest rate with the lower end of the interval: (12% + 2% = **14 %)**

Or Try with 13% 15%

$$13\% : 12{,}935\ \frac{(1-(1+0.13)^{-8})}{0.13} = 62{,}072.09$$

$$15\% : \text{----------} = 58{,}043.50$$

$$= \mathbf{4{,}028.59}$$

- 62,072.09
  -60,000.00
  2,072.09
- 2,072.09 X 2% = **0.01**
  4,028.59
  ⇒ 13% + 0.01 = **14%**

➢ Annuity Due

To calculate the present or future value of an annuity due, we first calculate the value ordinary annuity using the previous formulas and multiply the answer by (1+r). The relationship between the value of an annuity due and ordinary annuity is just:

- Annuity Due Value = Ordinary Annuity Value X (1+r)

➢ Perpetuity

An annuity that goes on indefinitely is called **perpetuity**. The payments of perpetuity constitute an infinite series.

Perpetuity is an annuity that has an indefinitely long life. A less formal approach is to describe perpetuity as an annuity that will not quit. Any perpetuity can be discounted by dividing the value of one payment by the required rate of return.

Perpetuities occur in certain types of valuation problems. In addition, long lived annuities can sometimes be treated as perpetuities in order to obtain good, first approximations of their present values; this is because the present value of an annuity approaches the present value of the corresponding perpetuity as the number of payments in the annuity increases.

✓ **The present value of perpetuity is:**

$$PV(\text{Perpetuity}) = \frac{\text{Payment}}{\text{Interest rate}} = \frac{C}{r}$$

For example, if the interest rate were 12 percent, a perpetuity of $1,000 a year would have a present value of $1,000/0.12 = **$8,333.33**.

Example 2

Grace Corporation needs $200,000 on March 31, Year 5. This amount is to be accumulated by making 16 equal deposits in a fund at the end of each quarter, starting March 31, Year 1 and ending on Dec. 31, Year 4. The fund will earn interest at 8% compounded quarterly. Compute the periodic rents.

❖ **Problems involving Unequal Cash Flows**

Whenever a series of cash flows or payments does not take an annuity form, it is described as unequal cash flow or a mixed stream of cash flows. This type of cash flow pattern also includes those situations where some years may be devoid of payments. To compound or discount unequal cash flows, we can just compound or discount each cash flow individually and add them up.

4.8 VALUATION OF FINANCIAL ASSETS

Valuation is the process of estimating the value of financial assets (bonds, preferred stocks and common stocks)

An asset, whether real or financial, has value to the extent that it can satisfy desires, needs or wants. The value is contained in their ability to produce cash flows over a given time interval.

A number of different concepts are used to measure asset values.

⇒ These concepts are:

1. Book Value-measures the value of individual assets based on the historical data reported in the balance sheet.
2. Market Value-is the value that can be obtained from the market
3. Liquidating Value-is the amount of cash that would be realized if the firm's assets were sold and its liabilities paid off. It is an important concept primarily when a firm is failing or when, for whatever reason, the firm cannot be sold as a going concern.
4. Intrinsic Value-this concept is used when measuring the desirability of corporate stocks and bonds as investment vehicles. It is often called fair value, investment value, or capitalized value. The intrinsic value of a financial asset can be defined as the sum of the present value of the cash flows returned by the asset when discounted at the investor's required rate of return.

4.8.1 Bond Valuation

When a corporation (or government) wishes to borrow money from the public on a long-term basis, it usually does so by issuing or selling debt securities which are generally called bonds. Bond is a long-term loan in the form of a promissory note.

❖ **Bond Terminology**

Par Value-is the principal amount, or face amount of the bond. It represents the amount the entity borrows and promises to repay at the time of maturity. Bonds return their par values at maturity unless the issuer retires them earlier.

Coupon Rate- is the rate of interest paid on the bond's par value. It is fixed over the life period, unless stated otherwise.

Coupon- is the interest payment made on a bond; it is equal to *par value* X *coupon rate*. For example if the Par value is $1,000 and the coupon rate is 10% then, the coupon amount is $100 ($1,000 x 10%) per year.

Bond quotations and prices – the price of a bond is quoted in percentage of its par value. For example, a $5,000 par value bond quoted at 76 % would cost $3,800($5,000 x 76%).

Current Yield-is the ratio of a bond's interest payment to its current market price.

Maturity period- is the number of years after which the par value is payable to the bondholders.

Selling at a discount-is selling a bond below its par value. Because bond interest payments are fixed amounts, a bond selling at a discount will have a current yield and a YTM that are larger than its coupon rate.

Selling at premium-is selling a bond above its par value. When a bond sells at a premium, its current yield and YTM will be less than its coupon rate.

Bond Indenture - the written agreement between corporation and the lender detailing the terms of the debt issue.

Zero coupon bond- a bond that pays no annual interest but is sold at a discount below par, thus providing compensation in the form of capital appreciation. The intrinsic value of any financial assets can be interpreted as the maximum price that can be paid by an investor if the asset's rate of return is to equal or exceed the investor's rate of return. If the financial asset's intrinsic value exceeds its purchase price, then the asset is a desirable investment. A financial asset's intrinsic value that just equals its purchase price is also a desirable investment. However, if a financial asset's intrinsic value is less than its purchase price, it is not a desirable investment.

❖ **General Valuation Model**

1. Estimate the future streams of cash flows(certainty assumption)
2. Establish the required rate of return (consider the available alternative investment)
3. Discount each cash flow to the present using the required rate of return.
4. Sum up the present values.

$$Vo = Po = \sum_{t=1}^{n} \frac{CF_t}{(1+r)^t}$$

Where,

CF_t = cash flow at time ***t***

r = required rate of return

Illustration 1

H-Corporation sold a $1,000,000 bond issue at the beginning of 1994 in order to obtain funds for expansion. The bonds were issued at face values of $1,000(for a single bond) with an original maturity of 10 years and a coupon rate of 10%. If an investor requires a 12% rate of return on these securities, what would be the value of these bonds to the investor in 1994? Assume the bond is to be purchased at the end of 1994 and that the first interest payment would be received at the end of 1995.

Given

Date of issue	End of 1994
Par value	$ 1, 000
Coupon rate	10%
Maturity Periods	10 years
Effective interest rate	12%

Solution

According to the above given, H-corporation will pay $100 (10% of 1,000 for each bond) per year for the next ten Years. Also H-corporation will pay the face value ($1000) at the end of the tenth year. Thus, we estimate the market value of the bond by calculating the present value of these cash flows separately and adding the result together.

i.) Using the general valuation method.

$$Po = \sum_{t=1}^{n} \frac{INT}{(1+r)^t} + \frac{Parvalue}{(1+r)^t}$$

$$Po = \frac{100}{(1.12)^1} + \frac{100}{(1.12)^2} + \frac{100}{(1.12)^3} + \ldots\ldots\ldots + \frac{100}{(1.12)^{10}} + \frac{1000}{(1.12)^{10}}$$

Po = **886.99**

ii.) Using the time value formula

First, we calculate the present value of the annuity stream, which is $100 per year for ten years

$$Po = 100 \left[\frac{1 - \frac{1}{(1.12)^{10}}}{0.12} \right] = \mathbf{565.02}$$

Second, the present value of the face value (i.e. $1000) which is going to be received at the end of the tenth year.

$$Po = \frac{1000}{(1.12)^{10}} = \underline{\mathbf{321.97}}$$

Then, we add the values for the two parts together to get the bond's value.

Total bond value = **565.02 + 321.97 = 886.99**

♠Impact of Required Rate of Return (RRR) on Bond Values:

When the RRR on a bond differs from its coupon rate, the value of a bond would differ from its par/face value. When the RRR is more than the coupon rate, the bond value would be less than its par value that is the bond would sell at ***discount***. Conversely, in case the RRR is less than coupon rate, the bond value would be more than the par value that is the bond would sell at a ***premium.***

Example-1:

√ **Given**

Par value	$1,000
Coupon rate	10%
Maturity period	10 years

Required - compute the value of the bond assuming the following RRR:

a) 10%
b) 8%
c) 12%

❖ An increase in interest rate will cause the prices of outstanding bond to fall, whereas decease in rates will cause bond prices to rise.

➢ **Yield to Maturity (YTM)**

YTM is defined as the rate required in the market on a bond, and is used as a basis for reaching bond investment decisions. If the bond's price is not too far from its par value, a good first guess as the bonds YTM is obtained by using the coupon rate as the discount rate. The intrinsic value computed making use of the coupon rate, as a discount rate, would be the par value of the bond.

∑ Illustration

A $5,000,000 bond matures in 10 years, carries a 12% coupon rate, and is currently quoted at 96%. Compute its YTM. a) the trial & error method B). Formula Method

⇒ Trial and Error

Since the value of the bond is 4,800,000 (5,000,000 X 96%) is less than the market price (i.e. 5,000,000); therefore, the YTM must be greater than 12%.

Then using 13%, we get;

$$Po = 600{,}000\left[\frac{1-\frac{1}{(1.13)^{10}}}{0.13}\right] + \frac{5000000}{(1.13)^{10}} = 4{,}728{,}688$$

Since the value of the bond at r =13% is less than the current market price, the YTM must be lower than 13%.Thus, the YTM is between 12% and 13%.

So in order to determine the exact value we can use linear interpolation, as discussed below:

- Determine the difference between the bond value at 12% & 13%:(5,000,000 – 4,728,688 = 271,312)
- Determine the difference between the desired value (4,800,000) and the value with the lower ***r***:(5,000,000 - 4,800,000 = 200,000)
- Determine the percentage distance across the discount range rates,12-13percent, i.e. divide the value from step II by the value in step I: (200,000 ÷ 271312 = .7372)
- Multiply the percent by the interval width of 1 percent (13%-12%):(0.7372 X 1%)
- Add the value in step IV to the interest rate with the lower end of the interval: (12% + 0.7372% = 12.7372 %)

  Thus, the YTM = 12.7372 %.

⇒ **Formula Method**

F = 5,000,000 x 12% = 600,000

V_B = 4,800,000

N = 10

P = 5,000,000

$$YTM = \frac{F + \frac{P - V_B}{N}}{0.60(V_B) + 0.40(P)}$$

Where,

F = Periodic interest payment

P = Principal

V_B = The value of bonds

N = Number of periods to maturity

$$YTM = 600{,}000 + \frac{5{,}000{,}000 - 4{,}800{,}000}{10} \div \frac{0.60(4{,}800{,}000) + 0.40(5{,}000{,}000)}{2}$$

= **12.71%**

➢ **CALL PROVISION**

Most corporate bonds contain a call provision, which gives the issuing corporation the right to call the bonds for redemption. The call provision generally states that the company must pay the bondholders an amount greater than the par value if they are called. The additional sum, which is

termed a ***call Premium***, is often set equal to one year's interest if the bond is called during the first year, and the premium declines at a constant rate of **INT/N** each year there after, where INT = annual interest and N = original maturity in years. ***Original maturity*** is the number of years to maturity as the time a bond is issued.

However, bonds are not callable until several years (generally 5 to 10) after they were issued. This is known as ***deferred call***, and the bonds are said to have ***call protection.***

2. Yield to call (YTC)

YTC is **t**he rate of return that the investor would earn if s/he bought a callable bond at its current market price and held it until the call date given that the bond was called on the call date.

The value of a callable bond is the sum of the present value of periodic interest payments and the present value of call price.

NB - Refer the computation of YTC from the supplementary note on unit 4.

∑ Risk of a bond

a) ***Interest rate risk*****-** the risk of a decline in bond's price due to an increase in interest rate. Interest rate risk is higher on bonds with long term maturity than on those maturing in the near future. Generally the longer the maturity of the bond, the more its price changes in response to a given change in interest rate. That is, the shorter the time period until a bond's maturity, the less responsive is its market value to a given change in interest.

b) ***Reinvestment rate risk*****-** the risk that a decline in interest rate will lead to decline in income from a bond portfolio.

c) ***Default risk*****-** another important risk associated with bond is default risk, if the issuer defaults, investors receive less than the promised return on the bond. Therefore, investors need to asses a bond's default risks before making a purchase.

NB - the greater the default risk, the higher the bond's yield to maturity.

4.8.2 Preferred Stock Valuation

Preferred stock is a stock with dividend priority over common stock, normally with a fixed dividend rate, sometimes without voting rights. Preferred stockholders have preference over common stock in the payment of dividends and in the distribution of corporation assets in the event of liquidation. Preference means only that the holders of the preferred shares must receive a dividend (in the case of an ongoing firm) before holders of common stock shares are entitled to anything. It is a hybrid security because it posses both debt and equity characteristics that affects the determination of an intrinsic value.

➢ FEATURES OF PREFERRED STOCKS

1. Par Value/Liquidating Value-preferred stock may or may not have a face value, or par value. If it does not have a par value, it will contain a liquidating value. The par value or liquidating value is the dollar per share that the preferred stockholder is entitled to receive from the corporation in the event of liquidation.

◆ The total per share claim in the event of liquidation is the liquidating value plus unpaid dividends.

2. Prices-preferred stock prices are quoted in dollars per share
3. Dividend rates-are quoted as a percentage of par value or in dollars.

4. Yield-the yield of preferred stock refers to its current yield-dividend divided by current market price. Preferred stock does not mature; thus, there is no meaningful measure of YTM for it.

❖ **The Intrinsic Value of Preferred Stocks**

Assumptions:

1. The corporation always tends to pay preferred stock dividends so that the stream of dividend to be paid is known with certainty (certainty assumption).

2. The dividends are received once a year and the first dividend is received one year after the stock is purchased.

The intrinsic value of preferred stock is the sum of the present value of future dividend payments discounted at the investor's required rate of return. Because the stock does not mature, the intrinsic value calculation does not allow for stockholders to receive the par value or liquidating value of the stock. Since the same dollar dividend is to be received each year, the stream of dividend is treated as perpetuity.

$$\text{Intrinsic Value of preferred stock (V)} = \frac{\text{Annual preferred stock dividend (D)}}{\text{The required rate of return (r)}}$$

In evaluating the desirability of a particular preferred stock, its intrinsic value can be compared with its purchase price, and an accept/reject decision can be made. If the stock's intrinsic value equals or exceeds its purchase price, the stock's rate of return will equal or exceed the investor's required rate of return. Otherwise, the stock should not be purchased.

Example:

A share of preferred stock pays a $10 annual dividend.

a) Calculate its intrinsic value to an investor whose required rate of return is 10%
b) If the preferred stock sales for $105 per share, is this a desirable investment?
c) If the stock is purchased for $95, what is the stock's required rate of return?

NB :- For clarification read your supplementary note.

4.8.3 Common Stock Valuation

Of the three types of financial assets, common stock is the most difficult to evaluate because of its residual ownership characteristics. Many different approaches can be used in determining the intrinsic value of the common stock that depends on the assumptions the investor makes concerning the corporation's future earnings, the amount and timing of its common stock dividends and the behavior of the stock's price in the secondary security markets.

➢ **Features of Common Stocks**

1. Common stock has no date of maturity
2. It may or may not have a par value, but it has no stated liquidation value. In the event of liquidation, common shareholders share in whatever funds remain after all liabilities have been met and after preferred shareholders have received their par value or liquidating value payments.
3. Dividends are never guaranteed, are not legally required, and are not fixed as in the case of preferred stock. Thus, common stock dividend can increase, remain constant, or decrease.

The intrinsic value of a share of common stock is the sum of the present values of future cash flows to be received from owning it, discounted at the investor's required rate of return. Some valuation models include only dividends in calculating intrinsic value. Others include both dividends and an eventual resale price. In all the alternative models, the following assumptions are made:

1. Dividends are paid annually

2. The first dividend is received one year after a share is purchased
3. Any stock sale occurs at the end of a year.

❖ COMMON STOCK VALUATION MODELS

➢ A) Zero Growth Model

The simplest approach to common stock valuation is to assume that the stock's current dividend will be constant over time and that the stock, once purchased, will be held indefinitely. The dividend stream is thus a long-lived annuity and is treated as if it were perpetuity. The intrinsic value of this dividend stream is computed by dividing one year's dividend by the investor's required rate of return.

Intrinsic value of common stock (Po) = D/Ke

Advantage: No forecasting of future dividends or resale price is needed

Disadvantage:

1. This model understates the stock's intrinsic value because in reality dividend will increase in the future
2. Unrealistic dividend stream is capitalized and lack of an explicit resale price in calculating the stock's intrinsic value

Example:

A corporation pays a dividend of $6 per year on each share of its common stock.

a) Compute the intrinsic value of the stock if the investor's required rate of return is 12%
b) If the stocks are traded in the market for $60 a share, is this a desirable investment for the investor?
c) If the investor purchased the stock for $45, what is the stock's required rate of return?

B) Constant Dividend Growth Model

Most common stock valuation models are built around the assumption that dividend increase over time and that the rate of increase can be approximated by a compound growth rate.

This model is based on the following assumptions:

1. Dividends grow at a constant annual (compound) rate
2. The dividend growth rate is less than the investor's required rate of return
3. There is no explicit resale price

On the basis of these assumptions, the intrinsic value is the sum of the present values of the future dividends. Since the dividend increases each year, it seems that the stock's intrinsic value would increase without limit, as more and more dividends are included. However, as long as the discount rate is greater than the dividend growth rate, the intrinsic value is a finite number. This is because the formula used is a type of convergent geometric series that result in a finite number. Therefore,

♠ **The intrinsic value of common stock (Po) =** $\frac{D_o(1+g)}{(Ke-g)} = \frac{D_1}{(Ke-g)}$ **Where**, D_o = is the most recent dividend per share

g = is the dividend growth rate

Ke = is the discount rate which represents the investor's required rate of return

Example 2

A corporation's common stock pays a current dividend of $6; the dividend is expected to grow at a rate of 2% per year indefinitely:

a) Compute the intrinsic value for this stock if the investor's required rate of return is 10%

b) Assume that the stock's current market price is $75, compute the required rate of return if the stock is bought at this price.

❖ **C) <u>Non Constant Growth Model</u>**

<u>Illustration 1</u>

For a simple example of non-constant growth, consider the case of a company that is currently not paying dividends. You predict that in 5 years, the company will pay a dividend for the first time. The dividend will be 0.50 birr per share. Then this dividend is expected to grow at a rate of 10% per year indefinitely. The required rate of return on companies such as this is 20%. What is the price of the stock today?

To see what the stock is worth today, we first find out what it will be worth ones dividends are paid. We can then calculate the present value of that future price to get today's price. The first dividend will be paid in 5 years, and the dividend will grow steadily from then on. Using the dividend growth model, we can say that the price in four years will be:

$P_4 = D_4 * (1+g)/(r-g)$

$= D_5/(r-g)$

$= 0.50/ (0.20-0.10)$

$= 5$ birr

If the stock will be worth 5 birr in four years, then we can get the current value by discounting this price back four years at 20%.

$P_o = 5/ (1.20)^4$

$=$ **2.41**

The stock is therefore worth **2.41** today.

<u>Illustration 2</u>

The problem of non-constant growth is only slightly more complicated if the dividends are not zero for the first several years. For example, suppose that you have come up with the following dividend forecasts for the next three years:

<u>Years</u>	**<u>Expected dividend</u>**
1	1.00
2	2.00
3	2.50

After the third year, the dividend will grow at a constant rate of 5% per year. The required return is 10%. What is the value of the stock today? In dealing with non-constant growth, a time line can be very helpful. The important thing to notice is when constant growth starts. For this problem the constant growth starts at time 3. This means we can use our constant growth model to determine the stock price at time 3, P_3. As always the value of the stock is the present value of all the future dividends.

To calculate this present value, we first have to compute the present value of the stock price three years down the road, just as we did before. We then have to add in the present value of the dividends that will be paid between now and then.

So, the price in three years is:

$P_3 = D_3 * (1+g)/(r-g)$

$= 2.50 * 1.05/(0.10-0.05)$

$=$ **52.50 birr**

We can now calculate the total value of the stock as the present value of the stock as the present value of the first three dividends plus the present value of the price at time 3, P_3.

$P_0 = D_1/(1+r)^1 + D_2/(1+r)^2 + D_3/(1+r)^3 + P_3/(1+r)^3$

$= 1.00/(1+0.10)^1 + 2.00/(1+0.10)^2 + 2.50/(1+0.10)^3 + 52.50/(1+0.10)^3$

= **43.88 birr**

==========

CHAPTER – FIVE
CAPITAL BUDGETING

➢ Meaning and Nature of Capital Budgeting

Capital Budgeting is the process of making investment decisions in capital expenditures. A **capital expenditure** may be defined as an expenditure the benefits of which are expected to be received over period of time exceeding one year. The main characteristic of a capital expenditure is that the expenditure is incurred at one point of time whereas benefits of the expenditure are realized at different points of time in the future. In simple language we may say that a capital expenditure is expenditure incurred for acquiring or improving the fixed assets, the benefits of which are expected to be received over a number of years in future. The following are some of the examples of capital expenditure.

1. Cost of acquisition of permanent assets such as building, plant and machinery, goodwill, etc
2. Cost of addition, expansion, improvement or alteration in the fixed assets.
3. Cost of replacement of permanent assets
4. Research and development project cost, etc

Capital expenditure involves non-flexible long-term commitment of funds. Thus capital expenditure decisions are also called as **Long Term Investment Decisions**. **Capital budgeting** involves the planning and control of capital expenditure. It is the process of deciding whether or not to commit resources to a particular long-term project whose benefits are to be realized over a period of time, longer than one year. **Capital budgeting** is also known as Investment Decision Making, Capital Expenditure Decision, Planning Capital Expenditure and Analysis of Capital Expenditure. According to T. Horngreen, "**Capital Budgeting** is long term planning for making and financing proposed capital outlays."

At each point of time a business firm has a number of proposals regarding various projects in which it can invest funds. But the funds available with the firm are always limited and it is not possible to invest funds in all the proposals at a time. Hence, it is very essential to select from amongst the various completing proposals, those which give the highest benefits. The crux of the capital budgeting is the allocation of available resources to various proposals. There are many considerations, economic as well as non-economic, which influence the capital budgeting decisions. The crucial factor that influences the capital budgeting decision is the profitability of the prospective investment. Yet the risk involved in the proposal cannot be ignored because profitability and risk are directly relate, i.e. the higher the profitability, the greater the risk and vice-versa.

There are many methods of evaluating profitability of capital investment proposals. Te various commonly used methods are as follows:

I) TRADITIONS METHODS:

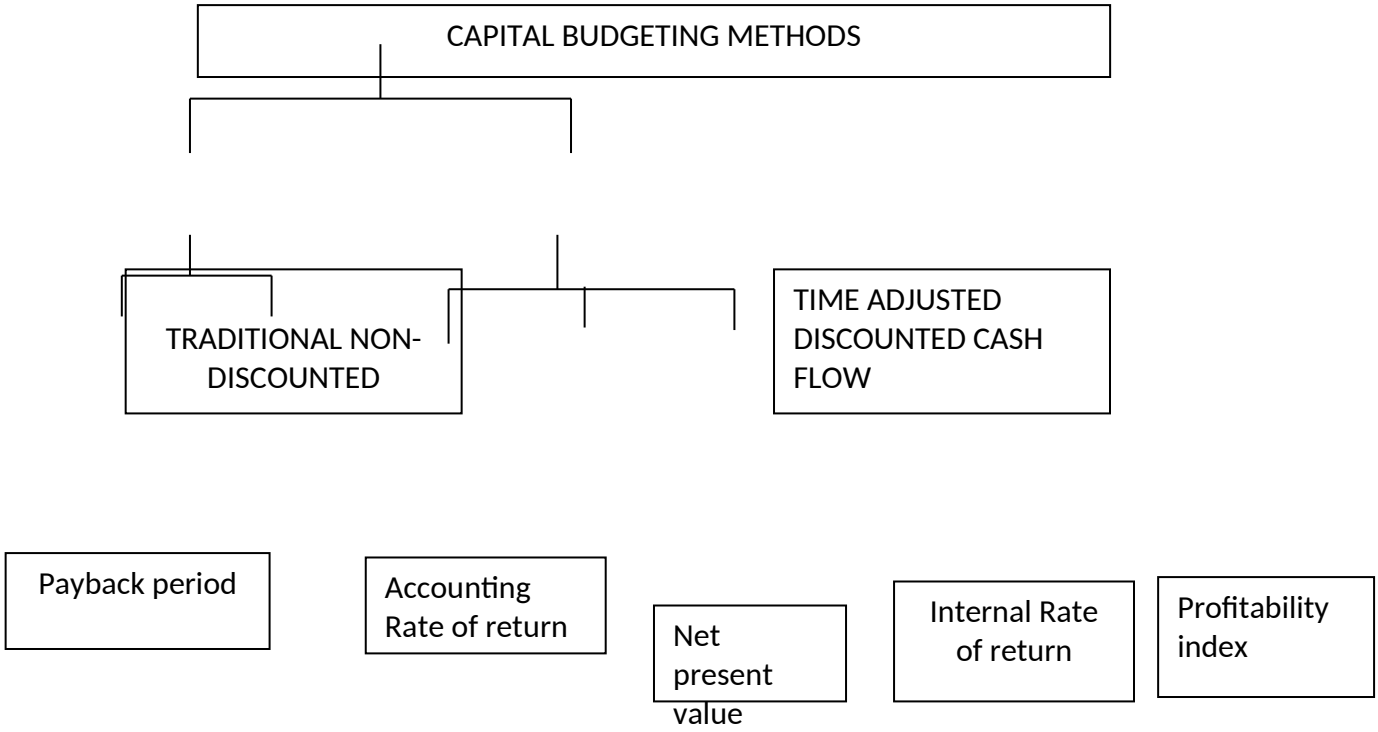
1. Pay Back Period Method
2. Average Rate of Return Method

II) TIME ADJUSTED METHOD OR DISCOUNTED METHODS:

1. Net present value method

2. Internal rate of return method

3. Profitability index method



1. **PAY- BACK PERIOD METHOD**

The 'pay back' sometimes called as **pay out** or **pay off** period method represents the period in which the total investment in permanent assets pays back itself., This method is based on the principle that every capital expenditure pays itself back with in a certain period out of the additional earrings generated form the capital assets. Thus, it measures the period of time of the original cost of a project to be recovered form the additional earnings of the project itself. Under this method, various investments are ranked according to the length of their pay back period in such a manner that the investment with a shorter pay back pied is preferred to the one which has longer pay back period.

The pay-balk period can be ascertained in the following manner:

(a) Calculate annual net earnings (profits) before depreciation and after taxes: these are called **Annul Cash Inflows**.

(b) Divide the initial outlay (cost of the project) by the annual cash inflow, where the project generate constant annual ash inflows:

Pay-back Period
= Cash Outlay of the project or Original cost of the Asset
Annual Cash inflows

(C) Where the annual cash inflows (profit before depreciation and after taxes) are unequal, the pay-back period can be found by adding up the cash inflows until the total is equal the initial cash outlay of project or original cost of the asset.

Example 1 A project cost $100, 000 and yields an annual uniform cash inflow of $ 20, 000 for 8 year. Calculate its pay-back period.

Solution

The pay-back period of the projects; is as follows:

Pay back period = Initial outlay of the project
Annual cash inflow

= 100, 000
20, 000 = 5 years

Example 2: Determine the pay- back period for a project which requires a cash outlay of $ 10, 000 and generates non uniform cash inflows of $ 2, 000. $ 4, 000, $ 3, 000 $ 2, 000 in the first, second, third and fourth year respectively.

Solution:

Total cash Outlay = $ 10, 000

Total Cash inflow for the first 3 years

= 2, 000 + 4, 000 + 3, 000 = $ 9, 000

Up to the third year the total cost is not recovered but the total cash inflows for the four years are $ 9, 000 + 2, 000 = $ 11, 000 i.e. 1000 more than the cost of the project. So the pay back period is some where between 3 and 4 years. Assuming that the cash inflows occur evenly throughout the year. The required to recover $ 1, 000 will be 1000./2000 12 = 6 months.

Hence pay back period is 3 years and 6 months.

Example 3: A Project cost $ 500, 000 and yields annually a profit of $ 80, 000 after depreciation @ 12% p.a but before tax of 50%. Calculate the pay back period.

Solution:	$
Profit before tax	80, 000
Less tax @ 50%	40, 000
Profit after tax	40, 000
Add back depreciation @ 12% on $ 500, 000	60, 000
Profit before depreciation but after tax or Annual Cash inflow	100, 000

Pay back period = Cost of the Project / Annual Cash inflow

= 500, 000 / 100, 000 = 5 years

Example 4: There are two projects X and Y. Each project requires an investment of $ 20, 000. You are required to rank these projects according to the pay back method from the following information:

- **(Net profit before depreciation and after tax)**

Year	Project-X	Project-Y
1st	1, 000	2, 000
2nd	2, 000	4, 000
3rd	4, 000	6,000
4th	5, 000	8, 000
5th	8,000	-

Solution:

The pay-back period for project X is 5 years, as

($1, 000 + 2, 000 + 4, 000 + 5, 000 + 8, 000) = $ 20, 000

While the pay-back period for project Y is 4 years, as

($ 2, 000 + 4000 + 6, 000 + 8,000) = $ 20, 000

Hence project Y should be preferred or ranked first

2. **ACCOUNTING RATE OF RETURN**

This method takes into account the earnings expected form the investment over their whole life. It is known as Accounting Rate of Return method for the reason under this method, the accounting concept of profit (net profit after tax and depreciation) is used rather than cash inflows. According to this method, various projects with the higher rate of return is selected as compared to the one with lower rate of return. This method can also be used to make decision as to accepting or rejecting a proposal. The expected return is determined and the project which has a higher rate of return than the minimum rate specified by the firm called the cut off rate is accepted and the one which gives a lower expected rate of return than the minimum rate is rejected.

- **The return on investment method can be used in several ways as follows:**

Average Rate of Return method: Under this method average profit after tax and depreciation is calculated and then it is divided by the total capital outlay or total investment in the project. In other words, it establishes the relationship between average annual profits to total investments.

Thus,

Average Rate of Return

$$= \frac{\text{Total profits (after dep. \& taxes)}}{\text{Net investment in the project * No. of years of profits}} \times 100$$

$$\frac{\text{Average Annual profits}}{\text{Net investment in the project}} \times 100$$

Example 5: A project requires an investment of $ 500, 000 and has a scrap value of $ 20, 000 after five years. It is expected to yield profits after depreciation and taxes during the five years amounting to $ 40, 000, $60, 000, $ 70, 000, & 50, 000 and $ 20, 000. Calculate the average rate of return on the investment.

Solution:

Total profit = $ 40, 000 + 60, 000 + 70, 000 + 50, 000 + 20, 000
= $ 2 40, 000

Average profit = $ 240, 000 = 48, 000
5

Net investment in the project = 500, 000 - 20, 000 (Scrap Value)
= $ 480, 000

Average Rate of Return
= Average Annual profit X 100
Net investment in the project
= 48, 000 X 100 = 10%
480, 000

(II) TIME- ADJUSTED OR DISCOUNTED CASH FLOW METHODS:

The traditional methods of capital budgeting i.e. pay-back method as well as accounting rate of return method, suffer form the serious limitations by giving equal weight to present and future flow of incomes. These methods do not take in to consideration the time value of money, the fact that a dollar earned today has more value than a dollar earned after five years. The **Time-Adjusted** or **Discounted Cash Flow Methods** take in to account the profitability and also the time value of money. These methods also called **Modern Methods of Capital Budgeting** are becoming increasingly popular day by day.

- ***Following are the discounted cash flow methods:***

1. NET PRESENT VALUE METHODS

The net present value method is a modern method of evaluating investment proposals. This method takes into consideration the time value of money and attempts to calculate the return on investments by introducing the factor of time element. The net present values of all inflows of cash occurring during the entire life of the project is determined separately for each year by discounting these flows by the firm's cost of capital or pre-determined rate. The following are the necessary steps to be followed for adopting the net present value method of evaluating investment proposals:

(i) First of all determine an appropriate rate of interest that should be selected as the minimum required rate of return called ' cut off rate or discount rate. The rate should be a minimum rate of return below which the investor considers that it does not pay him to invest. The discount rate should be either the actual rate of interest in the market on long-term loans or ; it should reflect the opportunity cost of capital of the investor.

(ii) Compute the present value of total investment outlay, i.e., cash outflows at the determined discount rate. If the total investment is to be made in the initial year, the present value shall be the same as the cost of investment.

(iii) Compute the present values of total investment proceeds, i.e., cash inflows, (profit before depreciation and after tax) at the above determined discount rate.

(iv)Calculate the net present value of each project by subtracting the present value of cash inflows from the present value of cash outflows for each project.

(v) If the net present value is positive or zero. I.e., when present value of cash inflows either exceeds or is equal to the present values of cash outflows, the proposal may be accepted. But in case the present value of inflows is less than the present value of cash outflows, the proposal should be rejected.

(vi)To select between mutually exclusive projects, projects should be ranked in order of net present values; i.e. the first preference should be given to the project having the maximum positive net present value. However as n become large, the calculation of $(1+r)^n$ becomes difficult. Present value can also be fond by the use of present value tables.

Illustration 1: From the following information calculate the net present value of the two projects and suggest which of the two projects should be accepted assuming a discount rate of 10%.

	Project X	**Project Y**
Initial Investment	$ 20, 000	$ 30, 000
Estimated Life	5 years	5 years
Scrap Value	$ 1, 000	$ 2, 000

The profits before deprecation and after taxes (cash flows) are as follows:

	Year 1	**Year 2**	**Year 3**	**Year 4**	**Year 5**
Project X	$ 5, 000	$ 10, 000	$ 10, 000	$ 3, 000	$ 2, 000
Project Y	$ 20, 000	$ 10, 000	$ 5,000	$ 3,000	$ 2, 000

SOLUTION

⇒ **Project X**

Year	**C.F $**	**P.V of $ @10% (D.R) Using Pv. Tables**	**P. V of Net C.F $**
1.	5, 000	0.909	4,545
2.	10, 000	0.826	8,260
3.	10, 000	0.751	7, 510
4.	3, 000	0.683	2, 049
5.	2, 000	0.621	1, 242
5. (S.V)	1, 000	0.621	621
			24,227

Present Value of all cash inflows = 24, 227

Less present Value of initial investment (B/c all the Inv't is to be made in the first year only the P.V is the same as the cost of the initial investment) = 20, 000

Net present Values = 4, 227

⇒ **Project Y**

Year	**C.F $**	**P.V of $ @10% (D.R) Using Pv. Tables**	**P. V of Net C.F $**
1.	20, 000	0.909	18, 180
2.	10, 000	0.826	8, 260
3.	5, 000	0.751	3, 755
4.	3, 000	0.683	2, 049
5.	2, 000	0.621	1, 242
5. (S.V)	2, 000	0.621	1, 242
			34, 728

Total present Value of cash inflows	= $ 34, 728
Less present value of initial investment	= $ 30, 000
Net Present value	= **4,728**

❖ ***We find that net present value of project Y is higher than the net present value of project X and hence it is suggested that project Y should be selected.***

Illustration 2: No project is acceptable unless the yield is 10%. Cash inflows of certain project along with cash outflows are given below:

Years	Out flows	In flows
0	$ 150, 000	-
1	30, 000	20, 000
2		30, 000
3		60, 000
4		80, 000
5		30, 000

✓ The salvage value at the end of the 5th year is $ 40, 000.

♠ **Calculate net present value.**

SOLUTION

CALCULATION OF P. V OF OUTFLOWS			
Year	**Outflow**	**P.V @ 10% D.R**	**P.V**
0	$ 150, 000	1	$ 150, 000
1	$ 30, 000	0.909	$ 27, 270
			177, 270

CALCULATION OF P. V OF INFLOWS

Year	Inflows $	P.V @ 10% D.R	P.V $
1	20, 000	0.909	18, 180
2	30, 000	0.826	24, 780
3	60, 000	0.751	45, 060
4	80, 000	0.683	54, 640
5	30, 000	0.620	18, 600
5 (S.V)	40, 000	0.620	24, 800
			186,060

Total present Value of cash inflows	186,060
Less present value of initial outflows	177,270
Net Present value	**8,790**

Disadvantages of the Net Present Value Method

⇒ **The Net Present value method suffers from the following limitations:**

(1) As compared to the traditional methods, the net present value method is more difficult to understand and operate.

(2) It may not give good results while comparing projects with unequal limes as the project having higher net present value but realized in a longer life span may not be as desirable as a project having something lesser net present value achieved in a much shorter span of life of the asset.

(3) In the same way as above, it may not give good results while comparing projects with unequal investment of funds.

(4) It is not easy to determine an appropriate discount rate.

2) INTERNAL RATE OF RETURN METHOD

The Internal Rate of Return method is also a modern technique of capital budgeting that takes in to account the time value of money. It is also known as "**Time Adjusted Rate of Return**' **Discounted Cash Flow**' ' **Discounted Rate of Return**, ' **Yield Method**, ' and '**Trial And Error Yield Method**'.

In the net present value method the net present value is determined by discounting the future cash flows of a project at a predetermined or specified rate called the **Cut-Off Rate**. But under the Internal Rate of Return Method, the cash flows of a project are discounted at a suitable rate by **Hit and Trial Method**, which equates the net present value so calculated to the amount of the investment. Under this method, since the discount rate is determined internally, this method is called as the **Internal Rate of Return Method**. The internal rate of return can be defined as that rate of discount at which the present value of cash -an inflow is equal to the present value of cash outflows. It can be determined with the help of the following mathematical formula:

$$C = \frac{A1}{(1+r)} + \frac{A_2}{(1+r)^2} + \frac{A_3}{(1+r)^3} + \ldots\ldots\ldots\ldots\ldots + \frac{A_n}{(1+r)^n}$$

- ✓ Where, C = Initial outlay at time zero

  A1, A2, and An = Future net cash flows at different periods.

  r = Rate of discount of internal rate of return.

The internal rate of return can also be determined with the help of present value tables. The following steps are required to practice the internal rate of return method.

(1) Determine the future net cash flows during the entire economic life of the project. The cash inflows are estimated for further profits before depreciation but after taxes.

(2) Determine the rate of discount at which the value of cash inflows is equal to the present value of cash out flows. This may be determined as explained after step (4)

(3) Accept the proposal if the internal rate of return is higher than or equal to the minimum required rate of return, i.e. the cost of capital or cut off rate and reject the proposal if the internal rate of return is lower than the cost of cut-off rate.

(4) In case of alternative proposals select the proposal with the highest rate of return as long as the rates are higher than the cost of capital or cut-off-rate.