



CA- INTER - GROUP - II

# FINANCIAL MANAGEMENT



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## CHP - 1

# Scope & Objectives of Financial Management



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### CONCEPTS COVERED

1. INTRODUCTION
2. FINANCE
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4. MEANING OF BUSINESS FINANCE
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6. APPROACHES TO FINANCIAL MANAGEMENT
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8. CONFLICT IN PRINCIPLES OF PROFIT V/S VALUE MAXIMIZATION
9. ROLE OF FINANCIAL MANAGER
10. IMPORTANCE OF FINANCIAL MANAGEMENT
11. RISKS IN FINANCIAL MANAGEMENT



## 1. INTRODUCTION :

Finance! We talk of business and we are seen talking of this word. Aren't we? Infact any economic activity starts with the word finance. Finance is associated with many questions like

- Where will we get the finance.
- How should we raise them.
- What is the cost of raising finance.
- Term of finance – long term or short term
- Who will provide it.
- Where shall we invest the finance. And so on

This is what all I am trying to answer in this book on Financial Management. So Guys let's start to explore the world of Finance.

## 2. FINANCE :

Finance is regarded as the life line of a business organisation. Finance is the pre-requisite for any economic activity. It is the master-key to all other resources required for the production and distribution of goods and services.

Again it should be noted that it is money which helps make more money. Money attracts money, if it is properly managed. Hence, efficient management of any business is closely connected to the efficient management of its finances.

## 3. BUSINESS FINANCE :

In general, finance means collection of money required for business activity. In management, finance has got much broader meaning. It means procurement of finance and its effective utilization. Some of the definitions to support my view are given below

According to wheeler "Business finance is that business activity which is concerned with the acquisition and conservation of capital funds in meeting financial needs and overall objectives of a business activities".

According to Guthman & Dougall "Business finance can broadly be defined as the activity concerned with planning, raising, controlling and administering of the funds used in the business".

## 4. MEANING OF BUSINESS FINANCE :

From the various above definitions of the term business finance – we can conclude that the term business finance involves

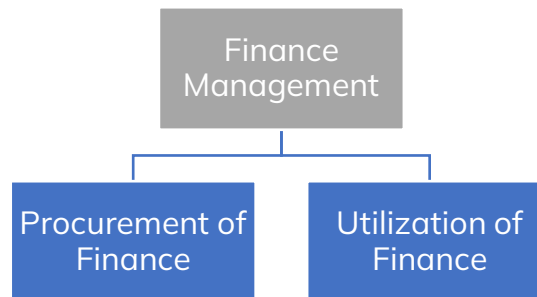
- Raising of finance
- Effective utilization of the above finance.

It is now clear that financial management this is a managerial activity. It requires great vision, wisdom and caution on the part of the management. It involves decision which helps management to maximise the shareholders value. It will require the management to make use of various financial techniques to optimise the value of the business and thereby value of shareholders.

Financial management comprises of forecasting, planning, directing, co-ordinating and controlling of all the activities relating to the acquisition and application of financial resources of an undertaking in keeping with its financial objectives. In short it includes entire gamut of financial efforts devoted to the management of finance.

Thus, financial management is mainly concerned with the proper management of funds. The finance manager must see that the funds are procured in the manner that the risk, cost and return considerations are properly balanced in a given situation and there is optimum utilisation of funds.

Let us now elaborate two basic aspects of Financial Management, which can also be referred to functions of financial management.



**1. Procurement of Funds :**

Funds can be procured by various sources. However procurement has never been as simple as the choices. Also the quantum of funds to be collected from each source is a matter of study. Some of the sources from which a business enterprise can obtain fund are:

- By Issuing Share Capital
- By Taking Short term, medium term, and long term loan from bank.
- By Issuing Debentures and Bonds
- Venture Capital Finance.
- Carbon credits.

Funds obtained from above sources have different characteristics in terms of risk.

**2. Effective Utilization of Funds Procured :**

The next important function of Financial Management is effective utilization of funds. The Funds collected should be properly utilised because the idle funds means wastage of resource, and also the providers of funds have certain expectation from the company.

All the funds are obtain at a certain cost. If these funds are not used in such way that they generate an income higher than the cost of obtaining the funds then, there is no use in running the organization.

**5. EVOLUTION OF BUSINESS FINANCE :**

Financial management evolved gradually over the past 50 years. Financial management, as on academic discipline, has undergone fundamental changes as regards its scope and coverage. The evolution of financial management is divided into 3 phases

- 1. Traditional Phase :** During this phase, financial management was considered necessary only during occasional events like mergers, amalgamation, acquisition, expansion, liquidation etc.
- 2. Transitional phase :** The importance and the scope of financial management increased during this phase. The day to day problems of financial managers where given importance. Greater emphasis were given to forecasting, planning and utilization of resources.

3. **The modern phase :** This phase is still on. Management is still evolving. The scope is widening day after day. Financial analysis is now given greater importance. Decision making is now evolving as a major subject in financial management. During this phase, many theories have been developed regarding efficient markets, capital budgeting, option pricing, valuation models and also in several other important fields in financial management.

## 6. APPROACHES TO FINANCIAL MANAGEMENT :

As discussed above the finance management, as an academic discipline, has undergone significant changes over years as regards its scope and coverage. In order to have a better exposition to these changes, it will be appropriate to study both the traditional approach and the modern approach to the finance function

### 1. Traditional Approach:

This approach was popular in the early part of this century. The role of financial management was limited to raising and administering of funds needed by the corporate enterprise to meet their financial needs. It broadly covered the following three aspects

- Procurement of funds from financial institutions
- Procurement of funds through financial instruments like shares, bonds etc.
- Looking after the legal accounting relation between the corporation and sources of funds.

Thus the traditional concept had limited scope and was restricted to the procurement of funds under major events in the life of the enterprise such as promotion, expansion, mergers etc. Finance manager has limited role to perform. The term '**corporate finance**' was used in place of the present term '**Financial management**'.

### 2. Modern Approach:

The traditional approach outlived its utility due to changes in business changes since the mid 1950's. Technological changes, competitive environment, corporate culture, widened markets etc. lead to expansion in the scope of finance management.

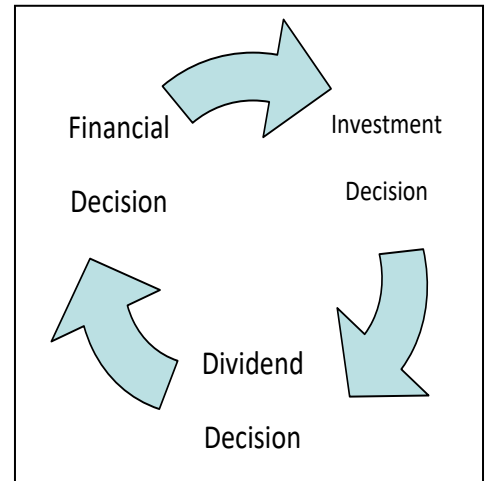
The modern approach is not concerned not only with the procurement of funds but also with its allocation. Thus, apart from the issues involved in acquiring external funds, the main concern of financial management is the efficient and wise allocation of funds to various uses.

The new approach places lot of importance on analytical way of viewing the financial problems of a firm. The main content of this approach are

- What are the total volume of funds an enterprise should commit?
  - What specific assets should an enterprise acquire?
  - How should the funds required be financed?
- Alternatively the principal contents can be said to be
- How large should an enterprise be, how fast should it grow?
  - In what form should it hold the assets?
  - What should be the composition of its liabilities?

These questions posed above cover between them the major financial problems of a firm. In other words, financial management, according to the new approach, is concerned with the solution of the three major problems namely **investment, financing and dividend decisions**. Thus in modern sense the term can be divided into three major decisions as functions of finance. They are

- (1) The Investment decision
- (2) The financing Decision
- (3) The Dividend policy decisions



**(1) The Investment Decision :**

It relates to the selection of assets in which the funds will be invested. The assets which can be acquired can fall into 2 groups i) Long term or capital assets and ii) Short term or current assets. Accordingly the asset selection decision of a firm is of two types.

- Capital budgeting – for long term or capital assets
- Working capital – for short term or current assets

**(2) Financing decision:**

The second major decision involved in financial management is the financing decision. Provision of funds required, at the proper time is one of the primary tasks of the finance manager. Every business activity requires funds and hence every financial manager is confronted with this problems. He has to identify the sources from which the funds can be raised, the amount that can be raised from each source and the cost and the consequences involved. A proper balance between the debt(Loans) and the equity is required to ensure the trade off between risk and the return to the shareholder is necessary. A Capital structure with a reasonable proportion of debt and equity capital is called the optimum capital structure. It should be noted that there is no single optimum capital structure – it varies from company to company.

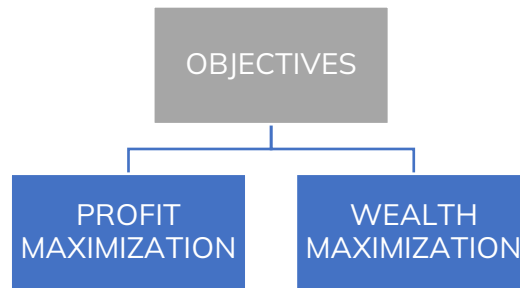
**(3) Dividend policy decision:**

The third major decision of financial management is the decision relating to the dividend policy. This decision relates to the determination of as to how much and how frequently dividend should be paid out to the shareholders. There are 2 alternatives available with the management to deal with the profits of the firm – to give dividends – to retain it for future expansion, growth and diversification. Now company needs to balance both – dividend and retain.

**7. OBJECTIVES OF FINANCIAL MANAGEMENT :**

Looking at various functions of financial management and approaches towards to it, brings us another question – as to what the objectives of financial management. Objectives are many, the list is like the demand list, however we shall the two main objectives of financial management are

1. Profit Maximization
2. Value Maximization



**1. Profit maximization :**

This is the most traditional assumption which still holds true - the very existence of any firm is to make profits. A business firm is the profit seeking organization. Any finance manager is expected to make decision - which will maximize the profit of the firm. However firm cannot choose only profit maximization as sole objective. Firm will not be able to survive with profit as only objective, profit should be complemented with other objectives. If profits are given much importance than the firm is bound to face some problems. **This is because the concept of profit maximization suffers from many limitation, some of them are :**

1. **It is vague :** It does not clarify what exactly it means. It conveys different meaning to different people. For example certain questions like which profits are to be maximized – short run or long run. What needs to be maximized the rate of profit or the amount of profit.
2. **It ignores timings :** This concept of profit maximization is not useful to evaluate projects of long term nature – the benefits of which are spread over the period of time. The fact that rupee received today is more valuable than the rupee received later – should be noted.
3. **It ignores risk factors :** There is the direct relationship between risk and reward. It is always said and heard that 'Higher the risk – Higher the returns'. If profit maximization is the only goal – then what about the risk. What if the person does not want to take the risk- does it mean that he does not like profits? Ha-ha – who does not like profits?
4. **It ignores other objectives :** Profit maximization as an objective is too narrow concept. It fails to take the social consideration like interest of the workers, consumers, society, business ethics, moral obligation etc. It is considered to be short sighted objective.

**2. Wealth/value maximization :**

What do we mean by wealth maximization? Let me first explain you does value maximization means. Shareholders invest in shares of the companies. The shares they purchase from the company as listed on the stock exchange. Maximization this share price is referred as value maximization.



Maximization of share holder's wealth as an objective of financial management means that the financial decision will be taken in such a way that the share holders receive highest combination of dividends and the increase in the market price of the share. Professor Ezra soloman has also suggested the adoption of wealth maximization as the best criterion for the financial decision making. Stock market – a place to buy and sell shares. People buy the shares as investment. They expect good returns. They expect the price to go up. Now it the responsibility of the Finance manager to see that they get this. The prices of shares are affected by many things – like good sales - good brand – good management – past records and so on. The value of the company's shares largely also depends on its net worth which itself depends on earning per shares (EPS). The finance manager decisions should be such that the prices go up and not down.

Thus, wealth or value maximization is the most important goal of financial management.

### **8. CONFLICT IN PRINCIPLES OF PROFIT V/S VALUE MAXIMIZATION :**

Now there is always an argument as to what to follow, profit maximization or value maximization, let us discuss on this issue

1. Many companies today follow profit maximization goal, but that may result in a failure to create share holders value.
2. Profit maximisation is the main objective of any business but, wealth maximisation is more superior objective, which is also technically correct.
3. While following profit maximization goal directors restrict payment of dividend whereas wealth maximisation suggest consistent payment of dividend to shareholder.
4. Profit maximisation as a goal is narrow and vague concept. It does not consider the risk factor and time value of returns. It gives importance to short-term profitability and short term projects.
5. Whereas, wealth maximization considered long-terms survival and growth, risk and time value of money, and all future cash flow, dividends etc.
6. Profit maximization decision are taken at cost of long-run stability and profitability while, under wealth maximization decisions are taken with a view to improve the share price.
7. Shareholders always give more preference to wealth maximization than to profit maximization. But, it is also equity important to earn profits. Therefore there is always a conflict between profit maximization and wealth maximization.

### **9. ROLE OF FINANCIAL MANAGER :**

From the above discussion, it is becoming more clear that finance holds a key position in the company's functions. The role of financial manager becomes more relevant in changing environment

To take the above decisions the Finance Manager performs the following functions in the following areas:-

**1. Forecasting and Planning**

Financial managements starts with estimation/forecasting the requirements of funds for both the short term and long term assets. Short term funds are needed for working capital needs whereas long terms funds are needed for fixed assets and for capital budgeting. Forecasting also involves budgetary control and long term planning. Forecasting such funds will mean that the financial manager needs to have vision and skill for such predictions.

**2. Financing Decision**

Once the quantum of funds needed is estimated, the next in line is financing decision. What are the sources to acquire such funds, what should be the composition of capital structure, are the question that needs to be answered at this stage. The finance manager should ensure lowest cost of capital. Finance manager should also ensure that the funds are adequate, and firm runs smoothly day in and out.

**3. Investment Decision**

The funds collected should be properly invested to ensure proper return to the providers of finance. The firm's objective should not be forgotten i.e value maximization. Capital budgeting decisions is one of the most important core functions of financial manager. He has to ensure that the funds are not lying idle, not invested in unproductive assets, working capital finance is adequate, no shortage of funds for day to day running of business is needed.

**4. Dividend Decision**

Dividend decisions affect the company's share price, P.E.Ratio, and goodwill of the company. Such decisions should be taken keeping earning trends, the return on investment, cash flow situations, future requirements of the company.

**5. Financial negotiation**

Financial Manager plays a very important role in carrying negotiations with financial institutions and banks while raising finance. They also play a very important role in financial discussion during mergers and takeovers.

**6. Cash Management**

It's the responsibility of the finance manager to ensure that the firm has an access to timely, cheap and adequate funds, be it short term or long term. He should also ensure that the funds are not lying idle. Cash holding also involves cost. So excess funds are waste of company ability and efficiency.

**7. Evaluating financial performance**



There is often an view that financing is one time activity. However it is not so. The financial manager needs to constantly monitor the financial performance of the company. Over the next chapter I will teach you how the financial manager on his own can change the fortunes of the company, can increase the profitability of the company. Consistent evaluation of the company's finances helps to increase the ROI.

#### **8. Dealing with relevant parties in the Financial Markets**

A listed company, has to constantly interact with stock exchange. It has to deal with various other entities in money market and companies act. Apart from regulatory authorities, the financial manager has to maintain regular touch with investors, bankers and others.

### **10. IMPORTANCE OF FINANCIAL MANAGEMENT :**

1. As discussed earlier, every economic activity involves finance, and sound financial management is needed for success and survival of every organization.
2. Sound Financial Management is even essential for not only profit making organization but also to non-profit making organization because even such institutions runs on finance.
4. Financial management helps in effective deployment of funds in the fixed assets and the working capital.
5. Financial Management helps the firm to optimize its growth within the given time frame.
6. Financial Management is an indicator of growth for many firms. Funds raised by the firms indicates the trust of the investor in the firm
7. It enables comparison with other firm's level of production, growth, capital structure and so on.
8. Financial Management helps in assessing as to how the company will perform in future. Companies with sound financial management helps in the company to with stand adverse positions in future.
9. Financial Management helps in indicating whether the firm will generate enough funds to meet its various obligations like repayment of debts, its interest, redemption liabilities, liquidity etc.
10. In a nutshell it is the heart and sole of business organization. Business organization with sound financial management are our future and those with weak financial management will perish.

### **11. RISKS IN FINANCIAL MANAGEMENT :**

Finance is not Risk Free. There are several risks involved in management of finance. The knowledge of such risk will help you all to plan properly for them. The risks involved in financial management are

1. **Default Risk :** There is always a risk of customer/debtor not paying up after sales. Bad debts are part and parcel of business today.
2. **Credit Risk :** The possibility that the borrower will not be able to repay the installments of the loan on proper time is called Credit Risk. Banks call such loans as Non performing Assets.
3. **Business Risk :** The Risk of failure of business entity which can result in decline in the earnings of the firm is called Business Risk. Every product has a life cycle. How can we

extend this is the question. Blackberry once hot sales, are now lagging behind and trying to survive.

4. **Liquidity Risk** : The risk which arises from the Inability to convert an investment into cash quickly is known as liquidity Risk.
5. **Inflation Risk** : The possibility that with an increase in the cost of living the returns generate by the business can be reduced or eliminated. Country like faces high risk of inflation. Infact inflation is referred as demon that needs to tamed quickly.
6. **Market risk** : Uncertainly in returns due to market condition changes such as change is preference and taste of customers, Natural Calamities, nor stable demand etc.
7. **Political Risks** : With growing size of business, world becoming the market, government plays a major role in business activity. Policies and government guidelines play active role in business today. For eg. Indian govt. approach to multi brand retail for years now has major players like Wal-Mart waiting for years.
8. **Interest Rate Risk** : Interest rates are regulated by central bank of the country. The risk due to changes in Interest rate of the Bank is known as Interest Rate Risk. Generally countries like India have seen a trend of high interest rates.
9. **Systematic Risk** : The risks that cannot be avoided are referred as systematic risks. Such risks are attributable to factors such as rise in price, change in supply of money, government expenditure level etc.
10. **Unsystematic Risk** : It is also referred as diversifiable Risk. It is a micro economic concept. The factors due to which such risk arises are strikes, machinery breakdown, stoppage in supply of Raw Material. Combining securities into diversified portfolios can reduce such risk. It is based on the principle of “Don’t put all the eggs in the same basket” diversify it.

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Thanks ....



## CHP - 2

# Types of Financing



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### CONCEPTS COVERED

1. INTRODUCTION
2. CLASSIFICATION OF SOURCES OF FINANCE
3. LONG TERM SOURCE OF FINANCE
4. SHORT TERM SOURCE OF FINANCE
5. OTHER SOURCES OF FINANCE
6. NEW FINANCIAL INSTRUMENTS
7. INTERNATIONAL SOURCES OF FINANCE



## 1. INTRODUCTION :

Finance is the Life Blood of Business. Infact the word business, cannot stand on its own. Business and finance go hand in hand. The financial requirements of the business can be classified in three broad categories

- ✚ Long Term Financial Needs
- ✚ Medium Term Financial Needs
- ✚ Short Term Financial Needs

1. **Long Term Financial Needs** : Funds are needed to finance the purchase of Fixed Assets. Every firm needs fixed assets like Land, Building, Plant and Machinery etc. To Finance them funds are needed for the period of 5 to 10 years. Such requirement is referred as Long term Financial requirements. Such funds can be raised by issue of Equity Shares, Preference Shares, Debentures, Long term Loans etc.
2. **Medium Term Financial Needs** : Such requirements are for the period ranging for period exceeding one year but not exceeding 5 years. Such Funds may be needed to finance huge advertisement campaign. Such Funds can be raised by issue of Preference Shares, Debentures, Bonds, Loans, Public Deposits. Etc
3. **Short Term Financial Needs** : Firm needs short term funds to finance its working capital needs. They are needed to finance purchase of Stock, Debtors, etc. Such funds are raised by Trade Credit, Bank Credit, Advances from customers, etc.

## 2. CLASSIFICATION OF SOURCES OF FINANCE :

The Sources of Finance can be classified as follows by using different basis

1. **According to Period**
  - ✚ Long Term – Shares, Retained Earnings, Debentures, Loans, Venture Capital Funding, Asset Securitization etc.
  - ✚ Medium Term – Preference Shares, Debentures, Loans, Lease financing, etc.
  - ✚ Short Term – Trade Credit, Bank Credit, Bank Financing, Advance from Customers
2. **According to Ownership**
  - ✚ Owners Capital – Equity Capital, Retained Earnings etc.
  - ✚ Borrowed Capital – Debentures, Public Deposits, Bank Loans etc.
3. **According to Source of Generation**
  - ✚ Internal Sources – Retained earnings and depreciation funds etc.
  - ✚ External Sources – Debentures, Loans Etc.

## 3. LONGER TERM SOURCES OF FINANCE :

1. **Equity Capital or Owners Capital**  
 This is the most common method of raising funds, every company uses this source to raise long term sources of finance.  
 A Share is the share in the capital of a company. The entire capital is divided into equal parts and each such part is referred as Share.

### Characteristics :

1. Equity Capital is the permanent Capital. The holders of Equity Shares are the real owners of the company . They are the one who takes the risk involved in the company.

2. Equity share holders are entitled for the share in profits of the company. The share is profit is distributed through dividend. The rate of Dividend is not fixed for Equity shareholders. They vary according to profits and policies of the companies with reference to dividends. Payments of dividend are appropriation of Profit and not charge against profits.
3. The Dividend to equity shareholder is paid after Dividend is paid to Preference shareholders.
4. In the event of winding up of company, equity claims are settled after preference claims. They have a right over the liquidations of the assets of the company only after the claims of other creditors is settled. In-short they are paid last.
5. Equity shareholders do enjoy voting rights. One share one Vote is the rule. Thus they control the functioning of the company, as they have a say in the working of the company.
6. The Cost of Equity capital is the highest, as they are the real owners, they are the one who take the risk, and hence expect higher returns.
7. In a nut-shell, equity shareholders are like a captain of the ship. They drive the ship, take the risk and are the last one to leave the ship.

**Advantages :**

1. It's a permanent source of finance. The company does not have to worry repayment to such holders which does not create burden on the cash flows of the company.
2. Payment of Dividend is an appropriation, and also its not obligatory, hence it does not create burden. Payment of dividend is at the discretion of the directors, even if company makes high profits, it can still pay low or no dividends and employ funds back into business for its expansion.
3. Equity capital acts like an umbrella to other sources of finance. It provides the security to others.
4. Equity capital gives flexibility to the company regarding the utilizations of funds.
5. Company may issue equity share by rights issue, incase further funds are needed.

**Disadvantages :**

1. Equity is the most expensive source of Finance. Floating cost of raising such is also high. The cost of maintaining such capital is pretty high as compared to other sources of finance.
2. The Payments of Dividend are appropriation and hence not tax deductible. Hence company does not get any benefit on payment of dividend.
3. There is always danger of losing control over the company as some shareholders may always try to acquire larger chunk of capital and gain control. Such risk is particularly high when new shares are issued for further finance.
4. A very large capital base, with no borrowed funds can reduce the earning per share of the company.
5. Large capital base also acts as an hindrance in decision making, Too many cooks spoils the dish. We should try to avoid over capitalization of the company.

## 2. Preference Share Capital

Preference shares are those shares which carry with them preferential rights for their holders, i.e.

1. Preferential right as to fixed rate of dividend &
2. Repayment of capital at the time of winding up of the Company.

### Characteristics :

1. Preference capital is not the fixed source of finance. They have to be re-paid at the pre-decided date and pre-decided rate.
2. Preference share capital are entitled for a fixed dividend every year. Dividends are to be paid irrespective of profits. Company may skip paying dividends in the years of losses but they are generally cumulative as they have to be paid when company gets adequate profits.
3. The rate of dividend to preference capital is generally higher than the rate given to debentures and bank loans.
4. Dividend to preference share holders is paid before dividends are paid to the equity shareholders.
5. In the event of winding up of the company, preference shareholders are paid before equity shareholders, which is very evident from its definition.
6. Preference shares can be participating, which allows them to participate in the excess profits of the company.
7. Such shares, generally, do not have voting rights.

### Advantages :

1. There is no danger of losing the control over the company. Preference shareholders does not enjoy any voting rights in the decision making process.
2. Issue of preference shares has no effect on the EPS of the company. Issue of Equity reduces the EPS.
3. Preference dividends are fixed and pre-determined. That's in a way good. They do not claim the share in profits, if company makes high profits. Its like fixed share "Take your share and rest is Ours"
4. Preference capital is redeemable after a specified period. So the burden of permanent services does not arise.

### Disadvantages :

1. The Payments of Dividend are appropriation and hence not tax deductible. Hence company does not get any benefit on payment of dividend.
2. Preference Dividend is cumulative in nature. This means that even though we may skip a year, it gets accumulated and has to be paid latter.
3. Preference share capital is not permanent in nature. They have to repaid back after certain period. Company have to plan for its redemption and accordingly adjust its cash flows.
4. Preference shareholders dilute the claim of the equity shareholders over the assets of the company. They are to be repaid back before the equity shareholders.



### 3. Retained Earnings

Retained earnings are internal source of long term finance. The profits can be accumulated and ploughed back into the business, which may facilitate the expansion of the company. The advantage of this source is it does not involve the cost of raising such funds. It also does not dilute the control of the owner over the company. Such funds are almost risk free. A company can plan future expansion, and can keep aside reasonable amount of profit and plough it back every year.

#### Advantages :

1. There is absolutely no cost involved in raising funds through this source. There is no floatation cost involved in raising funds through this source.
2. A company with high retained earnings enjoys high goodwill in the market. It also allows to absorb the unexpected adverse shocks and on the other side it allow the company to jump on any opportunity that comes its way.
3. There is no obligation to pay dividend on such source of finance.

#### Disadvantages :

1. People think that such funds are cost free. In reality it is not so. Accumulated profits mean reduction in dividend to shareholders. Shareholders will expect greater growth from the company and high dividend in future.
2. Shareholders may object retained earnings as they will deprive the shareholders of its regular dividends.

### 4. Debentures or Bonds

Debenture is an instrument of Debt. It's an borrowed source of finance. A debenture is a document issued by a company as an evidence of a debt due from the company with or without a charge on the asset of the company.

#### Characteristics :

1. It's an borrowed source of finance. The holder of debentures is known as debenture holder and is referred as creditors of the company.
2. They are issued in different denominations, and generally start with Rs. 100.
3. They are entitled for fixed payment on loans known as interest. The company may pay interest on yearly, semi-annually or quarterly basis, which is decided and announced at the time of issue.
4. Payment of interest to debenture holder is a charge against the profits and hence they are tax deductible. This reduces the cost of servicing to the company.
5. In the event of winding up of the company they are repaid before equity and preference shareholders.
6. They are repayable at the end of pre-specified period and at pre-specified rate.
7. They do not have any voting rights, unless on the matter which affects their interest in the company.
8. Debenture may be either secured or unsecured.
9. The cost of debentures is much lower than the cost of equity and preference and hence is preferred source of funding in case of expansion and growth. Floatation cost is much lower and also the annual cost of servicing loans are lower than annual cost of servicing equity and preference.

10. They are creditors and thus does not take part in the decision making process. This allows the management to take decisions freely without consultation on business matters.

#### **Advantages :**

1. Issue of Debentures does not affect the control of the company.
2. The cost of Debenture is lower than equity and preference because interest is tax deductible.
3. If the company is going great with growth and has good return, then financing through debenture can be great choice. It will increase the EPS of the company.
4. Debenture financing is also good in the period of rising prices. The fixed monetary payments actually decreases the cost in real terms.
5. Debentures are the creditors of the company and hence does not have any voting rights and does not affect the decision making process of the company.

#### **Disadvantages :**

1. Payment of debenture interest is a charge against the profit, i.e payment of interest is an obligation even if the cash/profits are insufficient.
2. Debentures are repayable after the specified period of time and therefore it leads to large cash outflow during redemption, which can affect the liquidity of the firm.
3. Excess leveraging can be dangerous if the earnings drops, then servicing debts can be burden and can lead to financial mess.

### **5. Loan financing**

The company may meet its financial requirements by taking both the short term loans / Credits and long-term loans.

Long terms loan can be availed from various Financial Institutions and commercial Banks.

#### **Loans from Financial Institutions**

Government of India has set various financial institutions and started various to provide long term financial assistance to companies. Some of this financial institutions are

-  Industrial Finance Corporation of India (IFCI)
-  State Financial Corporations
-  The Life insurance Corporation of India
-  The Industrial Development Bank of India
-  The Industrial Reconstruction Corporation of India
-  The Industrial Credit and Investment Corporation

The loans from these institutions are available at different rate of interest. Generally they are available at lower rate as compared to commercial bank.

#### **Loans from Commercial Banks**

The primary role of the bank is to provide short term finance to meet the working capital needs. However recently commercial have also started playing active role in providing

finance for long term finance requirements of the company. Infact many banks have started investing in primary market, subscribing to the share of the company.

### **Bridge Finance**

Commercial Banks are the major financier of Bridge Finance. Bridge finance refer to the finance taken by companies for short period till they get the disbursement of long term sanctioned loan. Normally, it takes time for financial institutions to disbursement of loans. However, once the term loans are sanctioned by financial institutions, the companies to avoid delays in starting the projects try and arrange funds for short period. Such loans are available from commercial Banks and are referred to as Bridge Finance. Though it is short term source, but it's an link to long term and hence we are discussing it under this head.

Such loans are generally repaid out of the proceeds of disbursements of term loan. They are generally secured by hypothecation of certain assets or on the basis of term loan sanctioned by financial institutions. The rate of interest charged on such loan is higher on bridge loan as compared to term loans. However since they are for short period, it is affordable as it avoids delay in implementation of projects stuck due to non availability of finance.

## **4. SHORT TERM SOURCES OF FINANCE :**

### **1. Trade Credit**

Trade Credit is a short term source of finance and is most common in all the business firms. It refers to credit granted to suppliers of goods for purchase of goods on credit. The usual duration for such credit is 30 to 90 days. It is infact the largest source of short term credit.

#### **Characteritics :**

1. It's a short term and most important short term source of finance.
2. It can be in form of regular open account or covered Bills Payable.
3. It is preferred to other sources of finance because it is without any explicit cost and it keeps on rotating i.e the cost of such credit is almost Nil.
4. Trade credit is available on continuous basis, there is no formal requirement regarding arranging finance like filling forms n all.
5. The firm can negotiate with the supplier for higher credit terms on the basis of reputation of the firm, financial position of the seller and the Volume of purchase.
6. Trade credit is the simplest source of finance, as it does not require any creation of charge and is available on regular basis.

#### **Merits :**

1. It is most simple and important source of finance as it is readily available.
2. It does not lead to creation of any charge nor it does not involve any formality regarding arrangement of loans.
3. The firm can negotiate with the supplier for higher credit terms on the basis of reputation of the firm, financial position of the seller and the Volume of purchase.

**Demerits :**

1. The availability of on liberal terms can be additive and can lead to over trading by the firm, which is dangerous
2. It very easy to say that the trade credit is available free of cost, however in reality it is not so, because the supplier has factored in all this cost and jacked up the selling price of the product.

**2. Accrued Expenses and Deferred Income**

Accrued Expenses or what we call as outstanding expenses, are the liabilities that are payable for the services already received. They have become due but are not paid. This allows the firm to utilize the cash on other requirements. They are spontaneous in nature. Deferred income refers the amount received by the company on goods and services which are yet to be delivered.

**Merits :**

1. Financing through accrual is a costless or interest – free source of financing.
2. Like trade credit it is also rotating source of credit. Like Salaries are to be paid only at the end of the month or next month and this cycle will continue.

**Demerits :**

1. Accrual account can be relied upon as it cannot be postponed indefinitely.
2. The people against whom such liabilities are outstanding may not appreciate if such payments are delayed and can lead to loss of goodwill on the firms part.
3. Such source of finance should be used as last resort.

**3. Advances from Customers**

There are many firms who resort to such practices. Such advances are much practiced in manufacturing firms, involved in manufacturing of high value, customized machinery. The firm do take advance to avoid cancellation of orders, but at a same time can be utilized as a source of finance.

**4. Commercial Paper**

Commercial paper can be issued by a non-banking company to raise short term finance for its working capital requirements. It is an unsecured money market instrument issued in a form of promissory notes. It may be issued at discount of the issuing company decides to do that.

It was introduced by RBI in 1990 with a view to enabling highly rated corporate borrowers to diversify their sources of short-term borrowings and to provide an additional instrument to investors. Subsequently, primary dealers and all-India financial institutions were also permitted to issue CP to enable them to meet their short-term funding requirements for their operations.

**Conditions on Issue of Commercial Paper :**

The issuing company should have

- a. The tangible net worth of the company, as per the latest audited balance sheet, is not less than Rs. 4 crore

- b. Company has been sanctioned working capital limit by bank/s or all-India financial institution/s; and
- c. The borrowal account of the company is classified as a Standard Asset by the financing bank/s/ institution/s.
- d. All eligible participants shall obtain the credit rating for issuance of Commercial Paper either from Credit Rating Information Services of India Ltd. (CRISIL) or the Investment Information and Credit Rating Agency of India Ltd. (ICRA) or the Credit Analysis and Research Ltd. (CARE) or the FITCH Ratings India Pvt. Ltd. or such other credit rating agency (CRA) as may be specified by the Reserve Bank of India from time to time, for the purpose.

#### **Duration and Denomination :**

CP can be issued for maturities between a minimum of 7 days and a maximum of up to one year from the date of issue. However, the maturity date of the CP should not go beyond the date up to which the credit rating of the issuer is valid. Commercial Paper is issued in multiples of Rs. 5 lakhs. The minimum amount to be invested

#### **5. Certificate of Deposit**

Certificate of Deposit (CD) is a negotiable money market instrument and issued in dematerialized form or as a Usance Promissory Note against funds deposited at a bank or other eligible financial institution for a specified time period. Guidelines for issue of CDs are presently governed by various directives issued by the Reserve Bank of India (RBI), as amended from time to time.

RBI does not prescribe any fixed interest rate for such instruments and can be issued at discount by the banks. It is advantageous to both the banker and the investor because of the following reasons

1. The Banker is not required to encash the deposit before the date of maturity. Hence, it is assured of funds for the period that it is issued for.
2. The investor is also assured of ready liquidity. Incase if he needs funds the instrument can be sold in secondary market.

The maturity period of commercial deposit is between 7 days to one year. The minimum size of the issue to a single investor is Rs. 1 lakh and shall be issued in the denomination of 1 lakh.

#### **6. Public Deposits**

Many companies accept deposits for short periods from public and shareholders. These deposits may be accepted for the period ranging from 6 months to 3 years. They are subject to the terms issued by RBI from time to time. Public deposits are unsecured loans and hence cannot be utilize to purchase fixed assets as they are to be repaid within the period of 36 months.

#### **Merits :**

1. Financing through public deposits is simple without much formalities involved.
2. It is cost effective method, just a mere advertisement to public regarding the issue is needed.
3. It is an unsecured instrument and therefore does not involve creation of any charge on the asset of the company.

4. The rate of interest and the period for which the public deposits are collection are fixed.

**Demerits :**

1. The company cannot rely on public deposit as a source of finance The companies enjoying good reputation in market can raise sufficient finance from this source, however the companies not so good in the books of public may find it tough and also during depression it may tough for companies to raise finance through this source.
2. The companies raising finance have to be very particular about its reputation as even a slight rumour about its financial health can lead to redemption of such deposits.

**7. Bank Advances**

Banks are most important source of short term finance. Commercial Banks are known to provide short term finance to various corporate across India.

Various forms of short term finance offered by banks are :

1. **Short Term Loans** : A Loan is a kind of advance provided by the bank with or without any security. The banker makes a lump sum payment to the borrower or credits his deposit account with the money advanced. It is given for a fixed period at an agreed rate of interest. Repayment may be done in installments or at the expiry of period. The customer will be charged interest on the full amount irrespective of the amount he utilizes.
2. **Cash Credits** : Cash credit is an arrangement in which a banker allows the customer to borrow money up to a certain limit. The customer may not withdraw full amount at one go. He may not even utilize the entire amount sanctioned by the banker. He is also allowed to deposit funds back into the account, whenever he has excess liquidity. Interest is charged by the bank on the actual amount utilized and actual period for which it is utilized.
3. **Bank Overdraft** : Under this arrangement the customer is allowed to overdraw in excess of his balance in the current account, with or without any security, if he requires temporary accommodation, This arrangement is very much similar to cash credit, as he is required to pay interest for the amount overdrawn and for the period it was over drawn. The difference between overdraft and cash credit, is the period for which such facilities are used. While the former is used for short period the latter is utilized for longer terms. The customer availing such a benefit is granted a fixed limit, over an above his balance, which can be overdrawn. The rate of interest is usually higher, because of the flexibility it provides to the customer.
4. **Advance against goods/ Hypothecation** : Banks advances credit against goods held by the customer. The possession of Goods is not given to the bank. The goods remain with the borrower in their godown, and definitely can sell them, however the banker have access to such godowns as an when they require. The borrower is required to furnish the details of its stock holding to the bank regularly. The credit granted against goods may be periodically changed depending on the stock holding of the company. Such loans are granted by bank

- to customers who enjoy good reputation in the market and share good and long relation with the bank.
5. **Pledge** : In pledge, the goods are placed in custody of bank. The borrower has no right to deal with them. Customers favour hypothecation to pledge because the latter is considered to lower the prestige of the customer.
  6. **Bills Purchased and Discounted** : This is most common method to finance credit allowed to debtors. Goods sold on credit to debtors against bills, can be discounted with banks. Banks do provide finance by discounting such bills for a charge known as discount. The net amount after deducting discount is credited to the account of the customer. The Customer transfer the bills to the bank who inturn will collect the amount, as and when due, from the third party. However incase of dishonor of the bill by the third party, the liability for the payment lies with the party who has discounted the bill.

## 5. OTHER SOURCES OF FINANCE :

### 1. Debt Securitization

Securitization, a financing technique which started way back in 1970 in USA, is a process by which financial assets are held together and securities are issued against such assets to raise finance.

Securitization is a process by which financial institutions holding pool of loans and receivables, creates securities against them, get them rated and sells them to investors to raise finance. The assets suitable for process are housing loans, loans on assets like car and scooter loans, receivables etc.

Let us understand the process and advantage of securitization by the following example

Mr. A borrows Rs. 10,00,000 from bank for purchase of house @ 10% per annum. So these leads to outflow of cash from bank. Later there is one Mr B who needs Rs. 8,00,000 from bank, however bank is short on liquidity to advance such a loan. What can bank do now ?

One option with the bank is to sell the Loan advance to Mr A to other financial institution, however, this means its leads to selling the old loan to raise funds to advance new loan. If the rate of interest is similar on both counts, then such an exercise is mere waste of time.

Another option is securitization; the bank can sell the old loan in the form of securities to various investors in different denominations and varying maturities. These securities are backed by assets against which old loans were sanctioned.

Securitization, therefore, is a process whereby loans and receivables are packaged, underwritten and sold in form of assets backed securities. It is known as debt securitization because the loans advanced by bank and other financial institutions are pooled together and are converted into securities.

It is a process whereby the assets of lending institutions are converted into negotiable instruments for generation of funds. It increases the liquidity of the lending institutions, which are always in need of funds to advance new loans and create new assets. The assets which can be used included for securitization are loans advanced and receivable of any type. They are pooled together, segregated in homogenous group based on risk level, maturity etc and liquidated in form of securities.



### Process of Securitization

**Step 1 :** A SPV (Special purpose vehicle) is created for the purpose of securitization

**Step 2 :** The primary financier, the institution which has granted loan against asset, sells the assets to SPV

**Step 3 :** The SPV, issues the securities, backed by assets, to the investors and raises the funds.

**Step 4 :** The funds raised used to pay the primary financier for the purchase of assets. Thus primary financier now has funds to raise new assets by granting advances.

### Advantages of Securitization

1. It allows the issuer – i.e original financier, to raise finance on off balance sheet asset.
2. The otherwise ill-liquid assets are converted into liquid assets.
3. It allows the primary financier to raise funds which can be lent to raise new assets, which will boost the profitability of the institution.
4. It enhances the credit rating of the primary financier.
5. It also provides new avenue of investment to the investor.
6. It is also in generic sense as it increases the liquidity in the economy as a whole, and leads to capital formation.

## 2. Lease Financing

This is another form of long term source of finance. It is a contract whereby the owner of an asset allows the usage of asset for the payment of specific amount. The asset is initially purchased by the lessor (leasing company) and thereafter leased to the lessee (User) which agrees to pay specified rent at periodic intervals.

### Types of Lease contracts

Lease contracts can be divided into following two categories

- a) Operating Lease
- b) Finance Lease

#### a) Operating Lease :

In such a lease the lessee is only provided the right to use the asset for a certain time at an agreed rentals. The Risk incident to ownership belongs wholly to the lessor. The lessor is not assured of recovery of capital outlay plus a return on the funds invested during the lease term. Such lease are, generally, cancelable with proper notice, before the end of the lease term. The term of such lease is usually shorter than the asset's economic life.

Operating Lease is particularly attractive to the companies, which looks to update and replace equipment regularly. Operating Lease will allow them to use asset without burden of ownership and avoid technological obsolescence.

#### b) Finance Lease :

Finance lease, as against operating lease, cover the life of the asset, assures the lessor of it capital outlay plus returns and are not cancellable. Generally, finance lease is very similar to loans, which are taken to purchase the asset, and then are repaid in installments. The only difference is that the ownership of the asset lies with the lessor,



In a nut shell, the lessor, purchases the asset and then leases out the asset to lessee, who has a right to use the asset for its full life, on payments of fixed rentals.

### **3. Seed Capital Financing**

As name suggest, such finance is needed at the stage of conception of idea, to start a business model. It may be required to do further research before actual commercialization can take place. Many entrepreneurs, in initial stages find hard to get funding at lower rate, which is necessary as they are not in position to borrow funds at market rates.

IDBI has designed seed capital assistance for professionally or technically qualified entrepreneurs and/or persons possessing relevant experience. Such finance is interest free, however a service charge of 1% P.A is charged for first five years and at increasing rate thereafter.

Seed Capital Financing is at infant stage in India, but is well known form of financing in developed countries.

### **4. Venture Capital Financing**

Venture capital is the form of equity capital financing, specifically designed to finance high risk and high return ventures. Start up, ambitious entrepreneurs need funding to give shape to their ideas. Generally such entrepreneurs lacks practical experience and funds, but the ideas they have can provide great returns. Projects on hi-technology products are generally investors favorite.

#### **Characteristics :**

1. Venture capital is generally in the form of equity financing
2. Apart from financing the, venture capitalist, with knowledge basket they have, helps the firms in management and designing, and other related inputs.
3. Such financing boost the confidence of new entrepreneurs, who in turn can do research on hi-technological product which can be of great advantage, not only to the company but also society at large.

#### **Venture Funds in India**

1. **Risk Capital Foundation of IFCI** : The first venture fund was set up by IFCI in 1975. At present there are three schemes operating, viz., Risk Capital Scheme, Technology Finance and Development Scheme and Venture Capital Unit Scheme.
2. **Venture Fund by IDBI** : The Industrial Development Bank of India (IDBI) also started venture capital scheme in 1986.
3. **Venture Capital Fund by SIDBI** : The Small Industries Development Bank of India (SIDBI) has also set up a venture capital fund with an initial corpus of Rs. 10 crores during the year 1992-93. The fund is meant exclusively to provide financial assistance for innovative ventures in small scale sector.
4. **Venture Capital Fund of Technology Development and Infrastructure Corporation of India (TDICI)** : The corporation has been set up by Industrial Credit Investment Corporation of India (ICICI) to provide finance to venture capitalist.

5. **Other Venture Capital Funds** : Apart from IFCI, IDBI, ICICI and SIDBI there are other banks like State Bank of India, Canara Bank, Central Bank, etc have also set up the venture capital funds.
6. **SEBI** : The major boost to venture capital in India, came in the year 1996. The Securities and Exchange Board of India (SEBI) issued guidelines for venture capital funds.

### Methods of Venture Capital Financing

1. **Equity Financing** : This is the most general form of financing. Entrepreneurs at start up stage require funds for longer period and may not be in position to provide return quickly in short period of times, hence they would want the investor to provide funds in form of equity, which does not carry the burden of repayments and returns. The financing through venture capital, generally, will not exceed 49%, to allow the management and the control to rest with the entrepreneur.
2. **Conditional Loans** : As the name suggest, the loans are conditional, means the provider of loans asks for returns in terms of royalty as and when the companies starts generating revenues. Such loans generally does not carry interest, as returns are repayable in terms of royalties. There is also no fixed repayment schedule for the repayment of the principle amount.
3. **Participating Debentures** : Interest on such debentures is payable in three phases
  - a. **First Phase** : No interest in the first phase
  - b. **Second Phase** : Low rate of interest is charged
  - c. **Third Phase** : High rate of interest.The rate of interest keeps on increasing as the project goes live and turns profitable.

### Factors to be considered by venture capitalist before financing Ventures

Venture capital is a known source of finance in developed nations and are slowly but steadily making inroads in developing economy. Frankly, success can be predicted, still the following point should be keep by the venture capitalist to avoid losses which financing the ventures

**Nature of Product / Service** : The venture capitalist should not be swayed or fall in awe of the product which the entrepreneur tries to sell. Many a times it is found that the product described sound great, as if it will change the nature of the world, but later it turns out that the product is not commercially viable or can't even be put to production.

**Future Prospects** : The venture capitalist are investing in future and not in present. So future visualization is needed. The product should be able to withstand the future changes in the economy and should be lead to obsolesce quickly enough. When MALLS started in India, it was like they will change the way people will shop, they did it, but very soon they are found to be wanted with the immergence of ONLINE thing.

**Entrepreneur** : The Venture capitalist should see the qualities, belief, the confidence, the level of risk taken by the entrepreneur. The Venture Capitalist should see that the entrepreneur has gone "ALL IN", which shows how serious is the entrepreneur about the success of the project.

**Exit Route :** Venture Capitalist looks at profits, and does not want to stay invested for the life of the project. They should establish a number of exist routes. These may include sale of their share to original promoters, or to other investors or issue to public at large.

**Management :** Venture Capitalist should also ensure that they are given seat on the board, so that they can take part in decision taken by the firm.

## **5. Hire Purchase**

Hire purchase refers to purchase of asset on installment credit. It is very much similar to lease financing; the difference is that the ownership is transferred to the user of the asset on the payment of final installment of the amount due.

Generally, vehicle used for pubic transfer are purchased on hire purchase basis. Commercial banks are key source of such finance.

### **Advantages :**

1. The franchisor can expand the business, without further investments, and can also use funds generated from franchising for further expansion.
2. The business can gain visibility, because of single brand being at all the outlets.
3. Cost of raising finance is very low, and it also assures regular periodic receipts on the turnover.

## **6. Franchising**

Franchising is another method of financing used to expand business. Under franchising agreement, franchisee is required to pay a franchising fee to the franchisor, for purchase of right to operate franchisor business in the area specified under the agreement. The franchisor is required to bear certain costs like advertisement cost, cost of support service etc. The franchisee with get the right to conduct the business and is required to pay regular payments in form of percentage on total sales.

## **7. Export Financing**

Exports are considered as back bone of any economy, may it be developed or developing, and plays greater role for growth and development of developing nations. India, specially places greater importance to exports for its growth and development. There are several factors that helps the nation to expand its exports and finance is one of the factors. In India finance to export can be divided into 2 parts

- a. Pre-shipment Finance i.e before the shipment of goods
- b. Post – Shipment Finance i.e After shipment of goods

### **A. Pre-shipment finance**

Exporter needs pre-shipment finance for buying, manufacturing, processing, packing and shipping goods to the overseas buyers. Commercial banks provide pres-shipment finance in the form of “Packing Credit”. An exporter with export order or letter of credit opened in his favor, can approach the bank for packing credit. Packing credit is available for the period upto 180 days. It is good short term source of finance to the exporters. Customers asking for packing credit are required to provide letter of credit or firm order copy to avail finance.

### Types of Packing Credit

1. **Clean Packing Credit** : The amount is advanced to the customers on basis of firm orders or letter of credit on case to case basis without any charge or control over the raw material or finished goods. The bank should keep proper margins to safeguard its interest.
2. **Packing credit Against Hypothecation of Goods** : The goods are hypothecated in favor of the bank and banks provide finance against such goods after keeping certain margin. The goods are in possession of the customer and customers are required to submit periodic details of such goods. Banks have access to such goods as and when required.
3. **Packing Credit Against Pledge of Goods** : Banks provide finance to exporter on Pledge of Goods. Goods are kept by bank in its own custody and are shipped from time to time. Its different from hypothecation as the possession of goods is with the bank.
4. **E.C.G.C guarantee** : Under this loans are sanctioned by banks for purchase of goods, manufacturing, processing against the credit guarantee issued by Export Credit Guarantee Corporation (ECGC).

### B. Post – shipment Finance

Exporter requires post – shipment finance because payment on goods sold to exported are generally on credit for period ranging from 60 days to 180 days. To maintain liquidity for this period post – shipment finance is needed.

### Types of Post Shipment Finance

1. Purchase / Discounting of Documentary export Bills : Finance is provided to exporters against export bills.
2. E.C.G.C guarantee : Under this loans are sanctioned by banks against the credit guarantee issued by Export Credit Guarantee Corporation (ECGC).
3. Advance against export bills sent for collection : Finance is provided to customers against export which are forwarded for collection through the bank. Such finance is provided to the customers on the basis of creditworthiness of customers.

### 8. **Factoring**

Factoring may be defined as financial service by financial institution to manage their receivables better. We all have heard that we can discount/sell bills of exchange to bank for immediate cash at a nominal charge known as “Discount”. Similarly, we may sell our debtors/receivable to financial institute for a Fee. Such financial institute which provides finance on receivables are referred as Factor.

Initially factoring started with financial service of purchase of receivables, but today factoring has grown to larger services and it involves wide range of activities. Any service, after sale of goods, like maintaining debtors, collection of receivables, taking risk of bad debts, advancing against receivables, invoicing, etc are within the scope of factoring. In this modern age of outsourcing, factoring is gaining lot of ground and is seen as major source of finance by firms across.

### Functions :

1. **Maintaining Records** : Factors now provide services which starts from recording sale, maintaining all records till the debtors are collected. Companies, forward the invoices once the sale is made and factors are expected to maintain records right till the collection.
2. **Credit administration** : It means factors are required to collect the debts. For such services factors are paid service charges on the amount of bills collected. It may even be fixed payment in some cases.
3. **Risk of Bad Debts** : Factors can take the risk of bad debts from the clients. Off-course they would charge for provided such a service.
4. **Credit financing** : This is where factoring started, providing finance to customers on their receivables. This helps the client to improve its liquidity position as in its funds are not blocked for the credit period.
5. **Information of receivables** : Factor have expanded where service profile, and have started to provide information to their clients on their customers.

### Types of Factoring Arrangement

1. **Advance Factoring** : The factor provides finance to clients immediately against receivables assigned to them.
2. **Maturity Factoring** : Factors does not provide advance, but are required to collect the receivables as n when due.
3. **Recourse Factoring** : Clearly evident from its name, the factor does not take any risk of nonpayment of dues. In case of nonpayment, the client is responsible to the factor for its advances.
4. **Non-Recourse Factoring** : The factors extends finance to the clients, then all the risks of nonpayment is with the factor.

## 6. NEW INSTRUMENTS OF FINANCE :

### 1. Secured Premium Notes with Detachable warrants

Secured premium notes are issued with detachable warrants. There are 2 components

- a. Secured Premium Notes
- b. Detachable Warrants

Secured premium notes, are redeemable after a notified period, say 4 to 7 years. The period for which SPN are issued, no interest is paid for such a period, and the holder can sell back the notes to the company at par at the end of the notified period. However, if they hold it further they are entitled for interest/premium on redemption.

Detachable warrants allow the holder a right to apply and get equity shares, provided SPN's are fully paid up. The conversion of detachable warrants into equity shares should be done within the specified time limit notified by the company.

### 2. Non – Convertible Debentures with Detachable Equity Warrants

The holder of NCD's with detachable equity warrants is given an option to buy specific number of shares of the company at the pre-decided prices. There is a specific lock-in-period after which the detachable warrant can be exercised. If the holder does not exercise these right, the unapplied portion can be disposed by the company at its liberty.

**3. Zero Coupon Bonds**

Coupon refers to interest. Zero Coupon means no interest is paid on such Bonds. They are issued at discount and are redeemable at Par. The difference between the issue price and the redemption value is return to investor. ZCB's have their origin in USA. In India Mahindra and Mahindra Ltd, were the first to issue such Bonds.

**4. Deep discount Bonds**

They are the type of Zero coupon bonds explained above. Bonds are issued at discount, redeemable at par, and no interest is paid on such bonds. These Bonds were first issued by Industrial Development Bank of India (IDBI) in the year 1992, with the face value of Rs. 100,000 at an issue price of Rs. 2,700 to be redeemable after 25 years.

**5. Zero Interest Fully Convertible Debentures**

Debentures issued are fully convertible into equity shares, once they are fully paid up, and after the specified lock-in-period. No interest will be paid on such debentures, till the expiry of lock-in-period. At the expiry of lock-in-period, the debentures will be fully and compulsorily converted into equity shares. IDBI was the first issuer of Zero Interest Fully Convertible Debentures.

**6. Auction Rated Debentures**

ANZ grindlays designed this debentures for Ashok Leyland Finance. It is secured, redeemable after 90 days, non convertible instrument. The interest is determined by the market. ALF issued this debentures for 3 years, which had zero coupon, which were issued at discount and redeemable at Par. The interest rate i.e rate of discount was negotiated after every 90 days and this continued for 3 years.

**7. Double Option Bonds**

These bonds were first issued by IDBI. The bonds were issued with the face value of Rs. 5000. It carries the rate of interest of 15% compounded semi-annually from the date of allotment (31.3.1992). The bond had the maturity period of 10 years. Each bond had two separate certificate, One for F.V. Rs. 5,000 and other for interest (including premium on redemption) of Rs. 16,500. Both these certificates are listed on all major stock exchanges. The investor thus have a flexibility of selling one or both parts as and when needed.

**8. Inflation Bonds**

As the name suggests, the interest rate on such bonds are adjusted on the basis of inflation. Thus investor is practically saved from inflation in the economy. For example, if interest rate is 8% and the inflation rate is 5%, then the investor shall be paid 13%, means he shall enjoy interest free of inflation.

**9. Floating Rate Bonds**

These are Bonds, where the rate of interest rate is not fixed. They are adjusted every year to the market rates. This allow the investor to earn the current rate in market. They are more popular during the period of rising interest rates. Institutions like IDBI, ICICI have been using them regularly.



### 10. Equity share with Detachable Warrants

Equity shares are issued with detachable warrants which will entitle the holder a right to apply for specified number of shares at a determined price.

These detachable warrants are separately registered with the stock exchanges and traded separately. The terms and conditions regarding the issue of equity against the warrants are decided in advance by the company issuing such warrants.

## 7. INTERNATIONAL FINANCING :

With growing globalization and liberalization by various countries, the scope of financial management has grown leaps and bounds. So raising finance has gone global. Indian MNC's today are interested in raising finance in foreign currency as well. The companies looking to raise finance in foreign currency can look at following avenues

### 1. External Commercial Borrowings (ECB)

ECB's refer to commercial loans, raised from foreign lenders with the varying maturity. Borrower can raise ECB's through internationally recognized sources. External Commercial Borrowings can be accessed under two routes viz

- a) Automatic Route
- b) Approval Route

A) Automatic route means there are no need to take prior approval from RBI/Government.

B) Approval Route means that prior permission is required to be taken from RBI/Government.

### 2. Euro Bonds

They are debt instrument which are not denominated in the currency of the country in which they are issued. For eg Dollar bond floated in India. Such Bonds are generally issued in a bearer form rather than registered form, which allow the investors privacy on investments.

### 3. Foreign Bonds

They are debt instrument which are denominated in the currency of the country in which they are issued. For eg Dollar bond floated in USA.

### 4. Euro Issues

Euro issue involves raising funds from European markets. The term "Euro Issue" simply means that issue are listed on an European stock exchange. The following are the various instruments through which finance are raised by Indian companies from foreign investors

#### A. Foreign Currency Convertible Bonds (FCDB's)

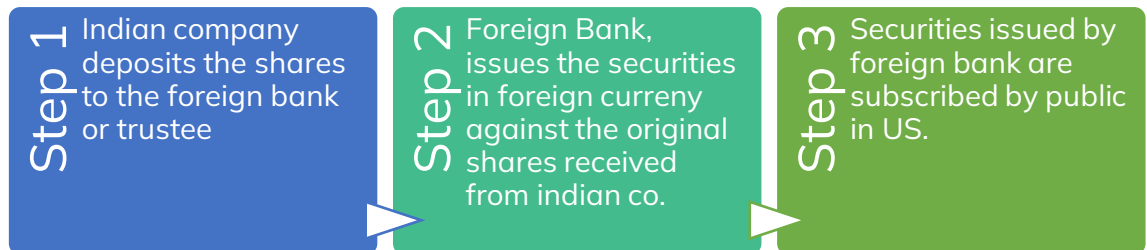
These bonds are issued and subscribed by non-resident investors in foreign currency. A convertible bond is a mix between a debt and equity instrument. It is a bond having regular coupon and principal payments, but these bonds also give the bondholder the option to convert the bond into stock.

This Bonds are issued with fixed maturity. It investor is assured of regular payments on the bonds and can also take advantage of appreciation of company's stock. The advantage to issuer is that the rate of interest on such

bonds is lower than normal interest rate, as they are convertible into equity shares. Companies like Reliance, Tisco, ICICI, etc have issued such bonds.

**B. American Depository Receipt**

It is a negotiable instrument denominated in U.S Dollar. They are issued by non US companies who wants to list on any of the US exchange. Each ADR represent a certain number of company's regular shares. ADR are issued by an approved New York bank or trust company against the deposit of original shares.



**C. Global Depository Receipts**

It is a negotiable instrument denominated in foreign currency, tradable on stock exchange in Europe or US or both. GDR represents certain no of equity shares of issuing country. For eg in case of Reliance Industries Limited one GDR represents two Equity Shares. GDR are quoted in Dollar terms but the equity shares are denominated in rupees terms. The process of issuing GDR is similar to ADR.

ADR's/GDR's and India : Indian companies, are now growing global and also have taken to ADR/GDR routes with both arms. Infosys Technologies was the first Indian company to be listed on Nasdaq in 1999. As on today there are no of Indian companies which are listed on foreign stock exchanges. These includes Tata motors, Dr Reddy's Lab, Ranbaxy, Larsen and Toubro, HDFC Bank etc.

**D. European Depository Receipts**

They are Similar to GDR, except that EDR's are only marketed in Europe and GDR are marketed in both US and Europe.

**E. Indian Depository Receipts**

The concept of ADR's is also applied by foreign companies wanting to raise funds in India. An foreign company wanting to raise funds from India, are required to deposit their shares to Indian bank or Indian trusty which will issue IDR's in Indian market denominated in rupees.

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Thanks ....





## CHP - 3

# Financial Statement For Analysis



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### CONCEPTS COVERED

1. INTRODUCTION
2. FINANCIAL STATEMENTS
3. COMPARATIVE FINANCIAL STATEMENTS
4. COMMON – SIZE FINANCIAL STATEMENTS
5. TREND ANALYSIS



## 1. INTRODUCTION :

Financial Statements are indicators of the two significant factors.

- (i) Profitability and
- (ii) Financial Soundness.

The term "Analysis" means careful study of specific aspect and drawing logical conclusion and using the derivations for future planning. For proper analysis methodical classification of the data given in the financial statements is the prerequisite. The financial statements are a gold mine for data. The figures given in the financial statements will not help us unless they are put in a simplified form. The process of breaking up a large mass of raw data into more simple and understandable form is known as "Analysis".

Analysis starts with systematic study of financial statements, gathering further data from the financial statements necessary for interpretations and conclusions, and then using the data and the conclusion for future planning.

## 2. FINANCIAL STATEMENTS :

The term 'Financial Statements' refers to two basic statements prepared by the accountant at the end of the accounting period. These are

- (a) Profit and Loss Account and
- (b) Balance Sheet.

The Balance Sheet is a statement of balances of assets and liabilities as at a particular date. The Profit and Loss Account is the statement of income.

From the above discussion, it is clear that the Financial Statements are snap shot of the activities of the business Concern at the end of a particular period.

Let us now start the process that will take us to the base camp of the mountain known as "Analysis". To start, we will convert the balance sheet and Revenue Statement in a Format that is favorable from the view point of Analysis and planning



### Question 1 – RM Ltd.

Re-arrange the following Balance Sheet, and Profit and Loss Account of RM Ltd. in a form suitable for analysis and calculate the following ratios :

#### Balance Sheet as at 31st March 2022

Liabilities	Rs.	Assets	Rs.
Bills Payable	25,000	Fixed Assets	1,25,000
Sundry Creditors	50,000	Sundry Debtors	50,000
Debentures	1,00,000	Bank Balance	25,000
Reserves	50,000	Inventory	1,25,000
Equity Share Capital	50,000		
Preference Share Capital	50,000		
<b>Total</b>	<b>3,25,000</b>	<b>Total</b>	<b>3,25,000</b>

**Profit and Loss Account for  
the year ended 31st March, 2022**

Particulars	Rs.	Particulars	Rs.
To Opening inventories	75,000	By Sales	5,00,000
To Purchases	1,50,000	By Closing Inventories	1,25,000
To Manufacturing Expenses	50,000	By Profit on sale of Shares	25,000
To Direct Wages	1,00,000		
To Administrative Expenses	25,000		
To Selling Expenses	25,000		
To Loss on Sales of Assets	27,500		
To Interest on Debentures	5,000		
To Net Profit	1,92,500		
<b>Total</b>	<b>6,50,000</b>	<b>Total</b>	<b>6,50,000</b>

**3. COMPARATIVE FINANCIAL STATEMENTS :**

Comparative Financial Statements are statements of the financial position of a business so designed as to facilitate comparison of different accounting variables for drawing useful inferences.

Financial statements of 2 or more business enterprises may be compared over a period of years. This is known as inter-firm comparison.

Financial statement of a particular business enterprise may be compared over a period of years. This is known as 'Horizontal Analysis'.



**Question 2 – G.C.C. Limited**

The following statements illustrate the comparative financial statements :

**G.C.C. Limited**

**Profit and Loss account for the year ended 31st March, 2021 and 2022**

	31.12.2021 (Rs.)	31.12.2022 (Rs.)		31.12.2021 (Rs.)	31.12.2022 (Rs.)
To Opening Stock	8,000	12,000	By Sales	60,000	1,00,000
To Purchases	30,000	80,000	By Closing Stock	12,000	30,000
To Wages	10,000	16,000			
To Factory Expenses	8,000	10,000			
To Gross Profit c/d	16,000	12,000			
	<b>72,000</b>	<b>1,30,000</b>		<b>72,000</b>	<b>1,30,000</b>
To Administrative Expenses	1,800	2,200	By G.P. b/d	16,000	12,000
To Selling and Distribution Expenses	3,300	2,300	By Interest on Investment	1,200	1,400
To Finance Expenses	800	400			
To Provision for Taxation	3,000	2,400			
To Net Profit	8,300	6,100			
	<b>17,200</b>	<b>13,400</b>		<b>17,200</b>	<b>13,400</b>

**Balance Sheet of G.C.C. Limited as on 31st March, 2021 and 2022**

Liabilities	31.12.2021 (Rs.)	31.12.2022 (Rs.)	Assets	31.12.2021 (Rs.)	31.12.2022 (Rs.)
<b>Share Capital :</b>			Fixed Assets	50,000	80,000
Equity Share Capital	60,000	60,000	<b>Less : Depreciation</b>	<u>6,700</u>	<u>8,000</u>
Preferential Share Capital		40,000		43,300	72,000
General Reserve	10,000	15,000	Investments (at cost)	12,000	14,000
P & L A/c.	6,000	8,000	<b>Current Assets :</b>		
8% Debentures	10,000	5,000	Stock	12,000	30,000
Bank Loan		20,000	Debtors	10,900	12,400
Sundry Creditors	3,200	5,000	Bank	5,000	17,000
Provision for Taxation	3,000	2,400	Cash	9,000	10,000
	<b>92,200</b>	<b>1,55,400</b>		<b>92,200</b>	<b>1,55,400</b>

**4. COMMON – SIZE FINANCIAL STATEMENTS :**

Financial statements when read with absolute figures may be easily understandable, and the conclusions drawn therefrom may be very useful. With a view to overcome the limitation, the determination of trends and the comparison of amounts are facilitated by use percentage of figures instead of absolute figures. In order to have a correct picture, the figures in the financial statements should be converted into percentage to some common base. This common base is 'Net Sales' in respect of 'Income Statement' and 'Total Assets' or 'Total Liabilities' or Total 'Net Assets' or 'Total Funds Employed' in the case of the Balance sheet.



**Question 3 – L Ltd.**

From the following financial statements of L Ltd. prepare a common size financial statements and give your comments on them.

**Profit and Loss A/c. for the year ended 31st March 2022**

	Rs.		Rs.
To Opening Stock	4,00,000	By Sales	20,00,000
To Purchases	12,00,000	By Closing Stock	6,00,000
To Wages	2,50,000		
To Factory overheads	2,50,000		
To G.P. C/d.	5,00,000		
	<b>26,00,000</b>		<b>26,00,000</b>
To Administrative Exp.	75,000	By G.P. b/d.	5,00,000
To Selling and Distribution Exp.	50,000	By Dividend	30,000
To Depreciation	65,000		
To Interest on Debentures	20,000		
To Net Profit c/f	3,20,000		
	<b>5,30,000</b>		<b>5,30,000</b>
To Preference Dividend	15,000	By Balance b/d	2,00,000

To Provision for Taxation (2006)	1,05,000	By N.P. b/d	3,20,000
To Surplus for Balance Sheet	4,00,000		
	<b>5,20,000</b>		<b>5,20,000</b>

**Balance Sheet as on 31st March 2022**

Liabilities	Rs.	Assets	Rs.
Equity Share Capital	10,00,000	Goodwill	5,00,000
Preference Share Capital	5,00,000	Plant & Machinery	5,00,000
General Reserve	1,00,000	Land & Building	8,00,000
Profit & Loss A/c. Balance	4,00,000	Furniture	1,00,000
Provision for Tax	1,05,000	Stock	5,00,000
Bills Payable	1,95,000	Bills Receivable	80,000
Bank Overdraft	1,00,000	Debtors	2,00,000
Creditors	5,00,000	Bank	2,20,000
	<b>29,00,000</b>		<b>29,00,000</b>

**5. TREND ANALYSIS :**

For the purpose of comparative study of financial statements over a number of years, trend percentages are very useful. Out of the periods under study, any one year is taken as base year and each item in this year is taken as 100. Trend percentage or trend ratios are computed by dividing amount of each item in the statement of each remaining year with the corresponding item in the base statement and the result is expressed in percentage

$$\therefore \text{Trend Percentage} : \frac{\text{Amount of year under study}}{\text{Amount of base year}} \times 100$$



**Question 4**

Analyze the trend from the following and offer your comment

**Balance Sheet as on 31st March**

	2019	2020	2021	2022
<b>Net Fixed Assets</b>	1,01,400	1,11,500	1,08,700	1,04,500
Cash	1,470	960	720	640
Stock	800	870	950	1,070
Debtors	760	910	960	1,030
<b>Total Assets</b>	<b>1,04,430</b>	<b>1,14,240</b>	<b>1,11,330</b>	<b>10,74,240</b>
<b>Capital</b>	1,03,680	1,13,490	1,10,510	1,06,260
Sundry Creditors	410	460	490	570
Overdraft	340	290	330	410
<b>Total Liabilities</b>	<b>1,04,430</b>	<b>1,14,240</b>	<b>1,11,330</b>	<b>1,07,240</b>

**Summarized Profit and Loss Account for the year ended 31st March**

	2019	2020	2021	2022
Sales	1,18,700	1,21,400	1,19,500	1,16,600
<b>Less : Cost of sales</b>	72,740	77,220	80,510	80,910
Gross Margin	45,960	44,180	38,990	35,690
<b>Less : Operating Expenses</b>	31,545	30,870	27,040	23,200
Net Profit	14,415	13,310	11,950	12,490

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Thanks ....



## CHP - 4

# Financial Analysis & Planning – Ratios Analysis



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### CONCEPTS COVERED

1. INTRODUCTION
2. WHAT ARE RATIOS ?
3. CLASSIFICATION OF RATIOS
  - (A) LIQUIDITY RATIOS
  - (B) LONG TERM SOLVENCY RATIOS / LEVERAGE RATIOS
  - (C) ACTIVITY RATIOS / EFFICIENCY RATIOS / PERFORMANCE RATIOS / TURNOVER RATIOS
  - (D) PROFITABILITY RATIOS
4. USERS AND OBJECTIVE OF FINANCIAL ANALYSIS
5. APPLICATION OF RATIO ANALYSIS IN FINANCIAL DECISION MAKING
6. LIMITATIONS OF FINANCIAL RATIOS
7. PRACTICAL PROBLEMS
8. SUMMARY OF RATIOS



## 1. INTRODUCTION

Accounting ratios are the effective tools for financial analysis and interpretations of financial statements. It is the process of identifying financial strengths and weakness of the firm by properly establishing relationship between various items of the Balance Sheet and Profit and Loss A/c. If properly used and applied, accounting ratios are capable of providing very useful information on the company's financial position, profitability and stability.

## 2. WHAT ARE RATIOS ?

What is Ratio? Quite often we associate this word to our school Knowledge of Chapter Known as "Ratio and Proportions". I always ask my students – when I teach them –

Is 1 : 2 Ratio?

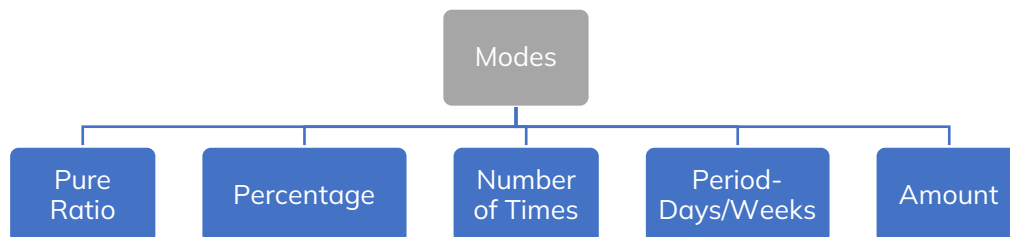
Is 1/2 the Ratio?

Is 0.5 the Ratio?

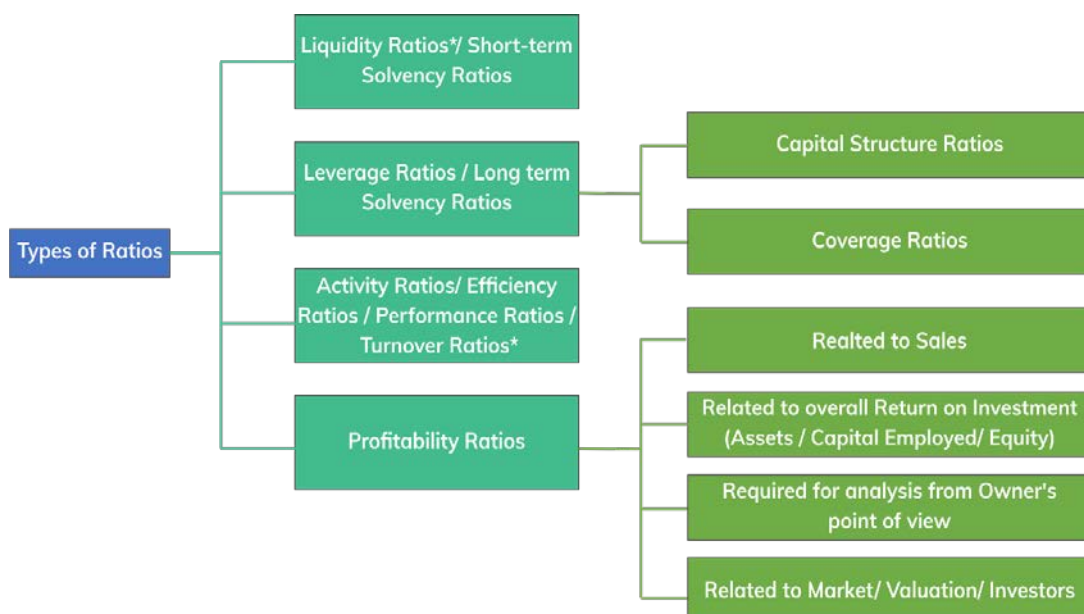
Is 50% the Ratio?

Quite often I get the answer that - Sir – 1 : 2 is the ratio. Guys each of the above the ratio. Infact they are different forms of writing the answers to Ratios. The Ratio can be defined as Relation between 2 variables. One Variable is the numerator and the other is the denominator.

It may be defined as "the relationship or proportion that one amount bears to another, the first number being the numerator and the latter the denominator. To illustrate, where current assets of a business on a particular date are Rs.3,00,000, while current liabilities are Rs.1,00,000 the resulting ratio would be Rs.3,00,000/1,00,000 i.e. 3 : 1.



## 3. CLASSIFICATION OF RATIOS :





**A. Liquidity Ratios :**

Various Liquidity Ratios are:



**(I) Current Ratio :**  
**Formula :**

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

**Interpretation :**

A generally acceptable current ratio is 2:1. But whether or not a specific ratio is satisfactory depends on the nature of the business and the characteristics of its current assets and liabilities.



**Question 1 – Leena Ltd.**

Extracts of Balance Sheet of LEENA Ltd. as at 31st March, 2022.

<b>Current Assets</b>	<b>Rs.</b>
Stock	7000
Debtors	4000
Cash at bank	2000
Cash at hand	500
Marketable securities (Non-trade quoted investments at market value)	1500
<b>Total</b>	<b>15000</b>
<b>Current Liabilities</b>	<b>Rs.</b>
Trade Creditors	7000
Outstanding expenses	2000
Provision for taxation less advance tax	500
Proposed dividend	500
<b>Total</b>	<b>10000</b>

(II) **Quick Ratio :**

**Formula :**

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

**Interpretation :**

An acid-test of 1:1 is considered satisfactory unless the majority of "quick assets" are in accounts receivable, and the pattern of accounts receivable collection lags behind the schedule for paying current liabilities.



**Question 2 –**

Calculate the Quick Ratio from the following information :

	Rs.
Cash in hand	20,000
Debtors	8,000
Creditors	5,000
Bills receivable	4,000
Outstanding salaries	4,000
Bank overdraft	9,000
Bills payable	7,000
Stock	2,000
Prepaid insurance	4,000

(III) **Cash Ratio / Absolute Ratio :**

**Formula :**

$$\frac{\text{Cash} + \text{Bank} + \text{Marketable Securities}}{\text{Current Liabilities}}$$

**Interpretation :**

The Absolute Liquidity Ratio only tests short-term liquidity in terms of cash and marketable securities/ current investments.

(IV) **Basic Defense Interval/ Interval Measure :**

**Formula :**

$$\text{Basic Defense Interval} = \frac{(\text{Cash} + \text{Receivables} + \text{Marketable Securities})}{(\text{Operating Expenses})/365}$$

**Interpretation :**

If for some reason all the company's revenues were to suddenly cease, the Basic Defense Interval would help determine the number of days for which the company can cover its cash expenses without the aid of additional financing.

(V) Net Working Capital :  
Formula :

$$\text{Net Working Capital} = \text{Current Assets} - \text{Current Liabilities} \\ \text{(Excluding short-term bank borrowing)}$$

Interpretation :

Bankers look at Net Working Capital over time to determine a company's ability to weather financial crises. Loans are often tied to minimum working capital requirements.

(VI) Stock to Working Capital Ratio :  
Formula :

$$\text{Stock to Working Capital Ratio} = \frac{\text{Closing Stock}}{\text{Working capital}}$$



**Question 3 – RM Ltd.**

Re-arrange the following Balance Sheet, and Profit and Loss Account of RM Ltd. in a form suitable for analysis and calculate the following ratios :

- (a) Current Ratio (b) Quick Ratio (c) Working Capital (d) Cash Ratio and (e) Stock Working Capital Ratio

**Balance Sheet as at 31st March 2022**

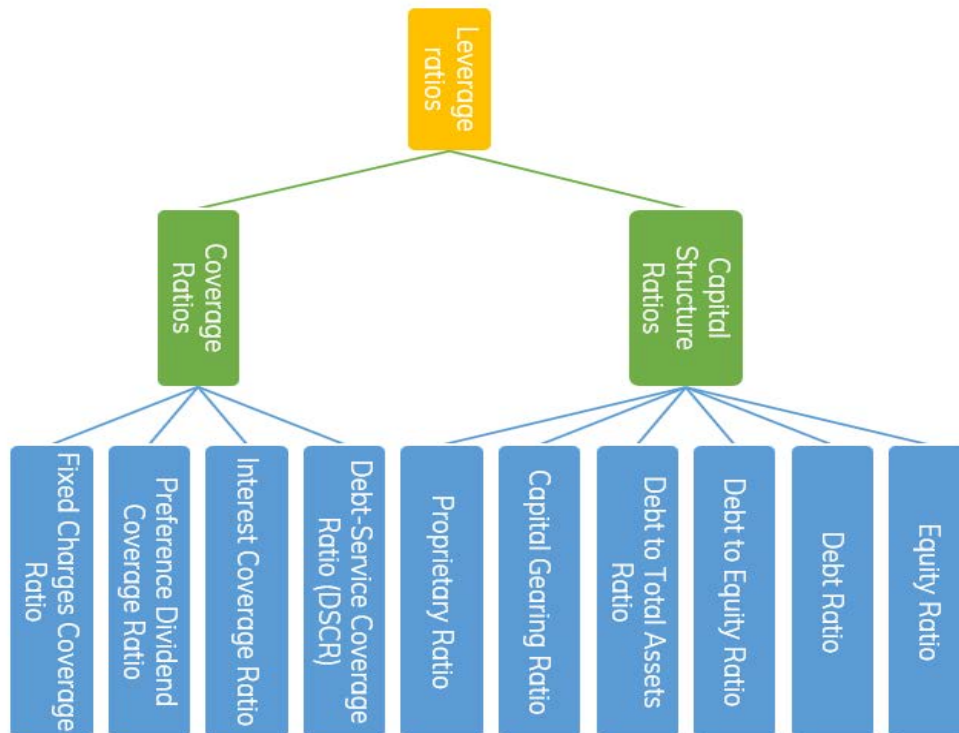
Liabilities	Rs.	Assets	Rs.
Bills Payable	25,000	Fixed Assets	1,25,000
Sundry Creditors	50,000	Sundry Debtors	50,000
Debentures	1,00,000	Bank Balance	25,000
Reserves	50,000	Inventory	1,25,000
Equity Share Capital	50,000		
Preference Share Capital	50,000		
<b>Total</b>	<b>3,25,000</b>	<b>Total</b>	<b>3,25,000</b>

**B. Long-term Solvency Ratios /Leverage Ratios :**

The leverage ratios may be defined as those financial ratios which measure the **long-term stability and capital structure of the firm**. These ratios indicate the mix of funds provided by owners and lenders and assure the lenders of the long-term funds with regard to:

- (i) Periodic payment of interest during the period of the loan and
- (ii) Repayment of principal amount on maturity.

Leverage ratios are of two types :



(I) Capital Structure Ratios :

(a) Equity Ratio :  
Formula :

$$\frac{\text{Share Holder Equity}}{\text{Total Capital Employed}}$$

**Interpretation :**

This ratio indicates proportion of owner's fund to total fund invested in the business. Traditionally, it is believed that higher the proportion of owner's fund, lower is the degree of risk for potential lenders.

(b) Debt Ratio :  
Formula :

$$\frac{\text{Debt}}{\text{Total Capital Employed}}$$

**Interpretation :**

This ratio is used to analyse the long-term solvency of a firm. A ratio greater than 1 would mean greater portion of company assets are funded by debt and could be a risky scenario.

- (c) **Debt Equity Ratio :**  
**Formula :**

$$\frac{\text{Debt}}{\text{Equity}}$$

**Interpretation :**

A high debt to equity ratio here means less protection for creditors, a low ratio, on the other hand, indicates a wider safety cushion (i.e., creditors feel the owner's funds can help absorb possible losses of income and capital). This ratio indicates the proportion of debt fund in relation to equity. This ratio is very often used for making capital structure decisions such as issue of shares and/ or debentures. Lenders are also very keen to know this ratio since it shows relative weights of debt and equity. Debt equity ratio is the indicator of firm's financial leverage.



**Question 4 –**

Calculate Debt-Equity ratio as on 31-3-2014. Equity Share Capital Rs. 10,000, 12% Preference Share Capital Rs. 10,000, Reserves Rs. 6,000, Profit & Loss Account (Cr.) Rs.24,000, 10% Debentures Rs. 50,000, Loan from HDFC Rs 20,000, Fixed Deposits from public Rs. 10,000, Preliminary Expenses Rs. 6,000, Underwriting Commission Rs. 4,000.

- (d) **Debt to Total Assets Ratio:**

This ratio measures the **proportion of total assets financed with debt** and, therefore, the extent of financial leverage.

**Formula :**

$$\text{Debt to Total Assets Ratio} = \frac{\text{Total Outside Liabilities}}{\text{Total Assets}} \text{ or } \frac{\text{Total Debt}}{\text{Total Assets}}$$

**Interpretation :**

Higher the ratio, indicates that assets are less backed up by equity and hence higher financial leverage.

- (e) **Capital Gearing Ratio :**

**Formula :**

$$\begin{aligned} &= \frac{\text{Funds bearing Fixed Rate}}{\text{Funds not bearing Fixed Rate}} \\ &= \frac{\text{Preference Capital} + \text{Debentures} + \text{Bank Loan}}{\text{Equity share capital} + \text{Reserves}} \end{aligned}$$



**Question 5 – Sonia Ltd.**

The following are the relevant extracts from the Balance Sheet of Sonia Ltd. as on 31st March, 2022. Compute the Capital gearing ratio.

	Rs.
10,000 Equity shares of Rs. 10 each fully paid	1,00,000
1000, 10% Preference shares of Rs.100 each fully paid	1,00,000
Security Premium	10,000
Profit & Loss A/c (Cr. Bal.)	20,000
Preliminary Expenses	10,000
Capital Reserve	20,000
10% Debentures	1,50,000
Bank Loan	50,000

- (f) **Proprietary Ratio :**  
**Formula :**

$$\text{Proprietary Ratio} = \frac{\text{Proprietary Fund}}{\text{Total Assets}}$$

**Interpretation :**

It indicates the proportion of total assets financed by shareholders. Higher the ratio, less risky scenario it shall be.



**Question 6 – RM Ltd.**

Re-arrange the following Balance Sheet, and Profit and Loss Account of RM Ltd. in a form suitable for analysis and calculate all capital structure ratios.

**Balance Sheet as at 31st March 2022**

Liabilities	Rs.	Assets	Rs.
Bills Payable	25,000	Fixed Assets	1,25,000
Sundry Creditors	50,000	Sundry Debtors	50,000
Debentures	1,00,000	Bank Balance	25,000
Reserves	50,000	Inventory	1,25,000
Equity Share Capital	50,000		
Preference Share Capital	50,000		
<b>Total</b>	<b>3,25,000</b>	<b>Total</b>	<b>3,25,000</b>

- (II) **Coverage Ratios :**

- (a) **Interest Coverage Ratio :**  
**Formula :**

$$\frac{\text{EBIT (Earnings Before Interest and Tax)}}{\text{Interest}}$$

**Interpretation :**

A high interest coverage ratio means that an enterprise can easily meet its interest obligations even if earnings before interest and taxes suffer a considerable decline. A lower ratio indicates excessive use of debt or inefficient operations.

**(b) Preference Dividend Coverage Ratio :**

**Formula :**

$$\frac{NPAT(EAT)}{Preference\ Dividend}$$

**Interpretation :**

This ratio indicates margin of safety available to the preference shareholders. A higher ratio is desirable from preference shareholders point of view.

**(c) Equity Dividend Coverage Ratio :**

**Formula :**

$$\frac{Earning\ after\ taxes\ (EAT) - Preference\ dividend}{Equity\ Dividend}$$

**(d) Fixed Charges Coverage Ratio :**

This ratio shows how many times the cash flow before interest and taxes covers all fixed financing charges. This ratio of more than 1 is considered as safe.

**Formula :**

$$\frac{EBIT - Depreciation}{Interest + Repayment\ of\ Loan}$$

**(e) Debt Service Coverage Ratio :**

**Formula :**

$$\frac{NPAT + Int. + Dep. + Amt. + Non\ Op.\ Adjustment\ like\ loss\ on\ sale\ of\ Asset}{Interest + Installment}$$

**Interpretation :**

Normally DSCR of 1.5 to 2 is satisfactory. You may note that sometimes in both numerator and denominator lease rentals may also be added.



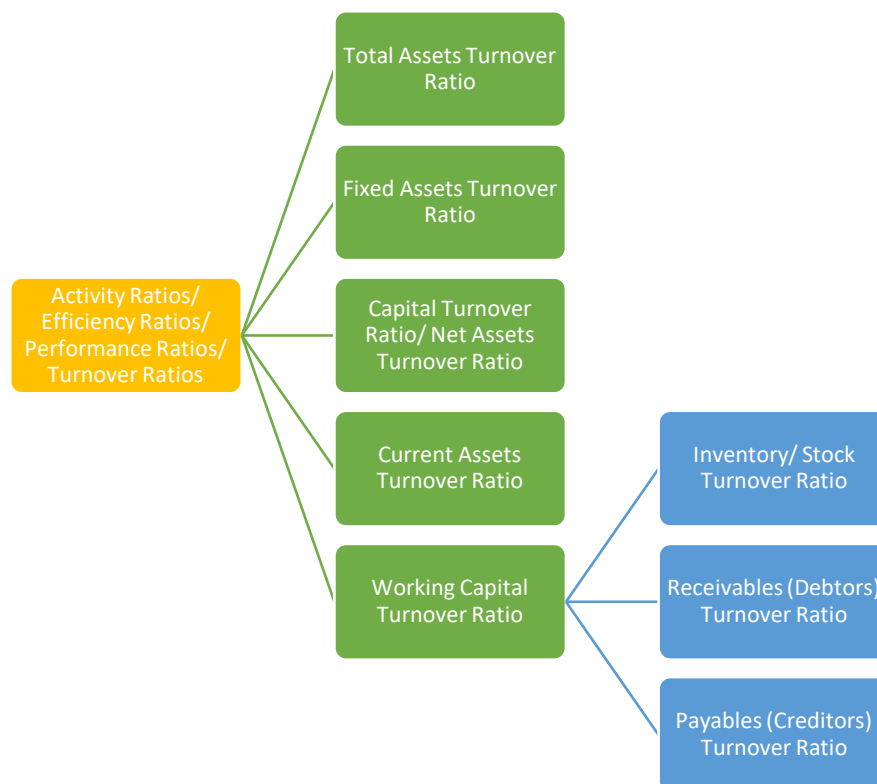
**Question 7**

**Profit & Loss A/c. for the year ended 31-3-22**

Particulars	Rs.	Particulars	Rs.
To Admn. Expenses	1,98,000	By Gross Profit	12,98,000
To Selling & Dist. Expenses	2,00,000	By Income from Investment	50,000
To Interest	50,000	By Misc. Income	2,000
To Loss on Sale of fixed Assets	12,000		
To Goodwill w/off	15,000		
To Depreciation	50,000		
To Prov. for taxation	4,00,000		
To Net Profit	4,25,000		
	<b>13,50,000</b>		<b>13,50,000</b>

Calculate Debt - Service coverage Ratio. Current Instalment of long - term loan payable Rs. 5,00,000.

**C. Activity Ratios / Efficiency Ratios / Performance Ratios / Turnover Ratios :**



**(I) Total Asset Turnover Ratio:**

This ratio measures the efficiency with which the firm uses its total assets. Higher the ratio, better it is. This ratio is computed as:

**Formula :**

$$\frac{\text{Sales/Cost of Goods Sold}}{\text{Total Assets}}$$



**Interpretation :**

A high total assets turnover ratio indicates the efficient utilisation of total assets in generation of sales. Similarly, a low asset turnover ratio indicates total assets are not efficiently used to generate sales.

**(II) Fixed Assets Turnover Ratio:**

It measures the efficiency with which the firm uses its fixed assets

**Formula :**

$$\frac{\text{Sales/Cost of Goods Sold}}{\text{Fixed Assets}}$$

**Interpretation :**

A high fixed assets turnover ratio indicates efficient utilisation of fixed assets in generating sales. A firm whose plant and machinery are old may show a higher fixed assets turnover ratio than the firm which has purchased them recently.

**(III) Capital Turnover Ratio/ Net Asset Turnover Ratio:**

**Formula :**

$$\frac{\text{Sales/Cost of Goods Sold}}{\text{Net Assets}}$$

**Interpretation :**

Since Net Assets equals to capital employed it is also known as Capital Turnover Ratio. This ratio indicates the firm's ability of generating sales/ Cost of Goods Sold per rupee of long-term investment. The higher the ratio, the more efficient is the utilisation of owner's and long-term creditors' funds.

**(IV) Current Assets Turnover Ratio:**

It measures the efficiency of using the current assets by the firm.

**Formula :**

$$\frac{\text{Sales/Cost of Goods Sold}}{\text{Current Assets}}$$

**Interpretation :**

The higher the ratio, the more efficient is the utilisation of current assets in generating sales.

**(V) Working Capital Turnover Ratio:**

It measures how effective a company is at generating sales for every rupee of working capital put to use.

Formula :

$$\frac{\text{Sales/Cost of Goods Sold}}{\text{Workig Capital}}$$

**Interpretation :**

Higher the ratio, the more efficient is the utilisation of working capital in generating sales. However, a very high working capital turnover ratio indicates that the company needs to raise additional working capital for future needs.

Working Capital Turnover is further segregated into Inventory Turnover, Debtors Turnover, and Creditors Turnover.

**Note :** Average of Total Assets/ Fixed Assets/ Current Assets/ Net Assets/ Working Capita also can be taken in the denominator for the above ratios.

(VI) **Stock Turnover Ratio :**

**Formula :**

$$\text{Stock Turnover Ratio} = \frac{\text{Cost of Goods Sold}}{\text{Average Stock}}$$

$$\text{Period} = \frac{\text{Average Stock}}{\text{Cost of Goods Sold}} \times 12/52/365$$

**Components :**

(i) Cost of Goods Sold = Opening .Stock + Purchase (Net) + Direct & Manufacturing Expenses — Closing Stock

OR

Cost of Goods sold = Net Sales — Gross Profit

(ii) Average Stock =  $\frac{\text{Opening Stock} + \text{Closing Stock}}{2}$

**Interpretation :**

This ratio indicates that how fast inventory is used or sold. A high ratio is good from the view point of liquidity and vice versa. A low ratio would indicate that inventory is not used/ sold/ lost and stays in a shelf or in the warehouse for a long time.



**Question 8**

Calculate stock turnover ratio from the following information sales Rs.10,00,000, G.P. ratio = 20%, opening stock 80,000 closing stock 1,20,000

**Note :** In case of manufacturing concern, we may calculate the following three stock turnover ratio.

(a) Raw material t/O ratio =  $\frac{\text{Raw material consumed}}{\text{Average stock of RM}}$  = time OR

$$= \frac{\text{Average stock of RM}}{\text{Raw material consumed}} \times 12/52/365 = \text{_____ Period}$$

(b) W.I.P.  $t_{10} = \frac{\text{Factory Cost}}{\text{Average stock of WIP}} = \text{_____ times}$

Or  $\frac{\text{Average stock of WIP}}{\text{Factory Cost}} \times 12/52/365$

(c) Finished goods turnover ratio  
 $= \frac{\text{Cost of goods sold}}{\text{Average stock of finished goods}} = \text{_____ times}$

Or  $\frac{\text{Average stock of finished goods}}{\text{Cost of goods sold}} \times 12/52/365 \text{ _____ period}$

**(G) Debtors Turnover Ratio :**

**Formula :**

$$\text{Debtors Turnover} = \frac{\text{Net Credit Sales}}{\text{Avg. Debtors of Avg. of Bills Receivable}} = \text{Times}$$

$$\text{Avg. Age Debtors} = \frac{\text{Avg. Debtors} + \text{Avg. B.R.}}{\text{Net Credit Sales}} \times 365 \text{ days/12 months}$$

**Interpretation :**

The average collection period measures the average number of days it takes to collect an account receivable. This ratio is also referred to as the number of days of receivable and the number of day's sales in receivables. In determining the credit policy, debtor's turnover and average collection period provide a unique guidance.



**Question 9**

**Calculate Debtors Turnover Ratio from the following :**

Total Sales Rs. 1,00,000; Cash sales Rs. 20,000; Debtors as on 1.1.2022 Rs. 10,000; Debtors as on 31.12.2022 Rs. 20,000; B.R. as on 1.1.2022 Rs. 10,000; & B.R. as on 31.12.2022 Rs. 25,000;

**(H) Creditors Turnover Ratio :**

**Formula :**

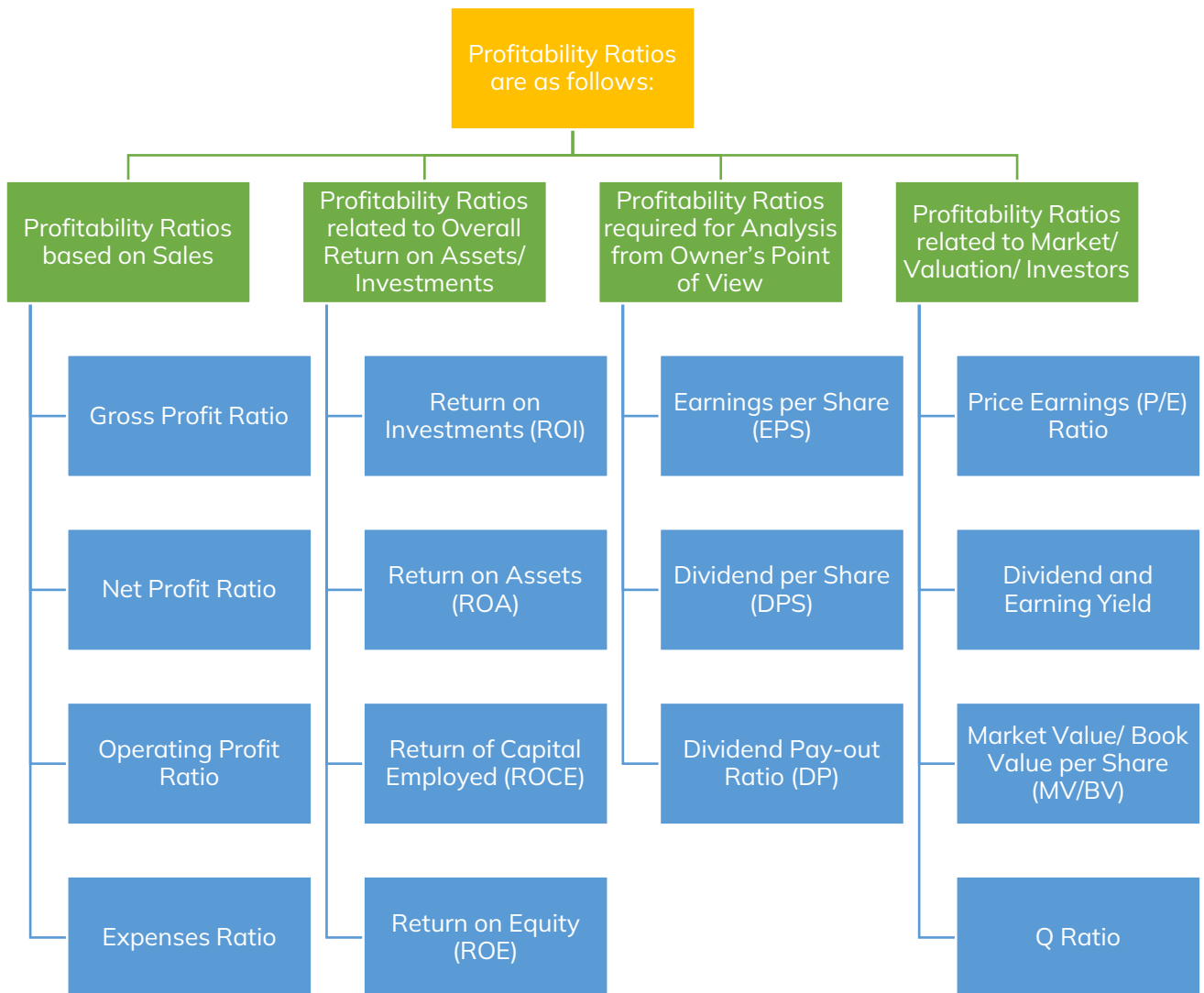
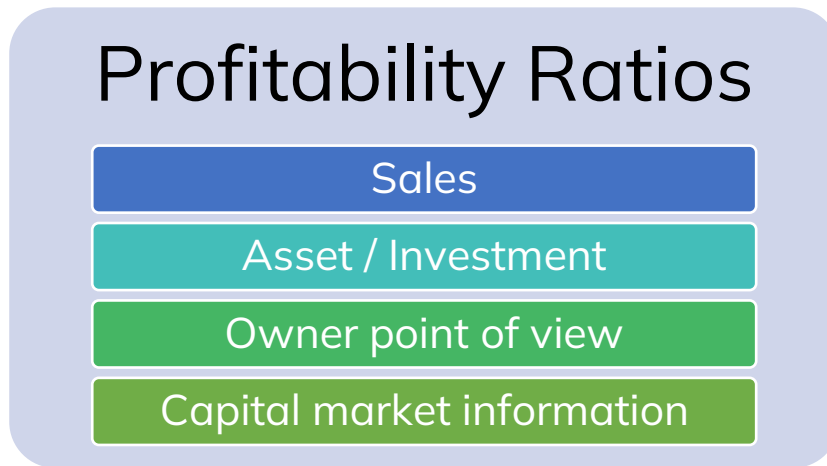
$$\frac{\text{Net Credit Purchase}}{\text{Avg. Creditor of Avg. of Bills Receivable}}$$

**Interpretation :**

The firm can compare what credit period it receives from the suppliers and what it offers to the customers. Also, it can compare the average credit period offered to the customers in the industry to which it belongs.

**D. Profitability Ratios :**

The profitability ratios measures the profitability or operational efficiency of the firm. These ratios can be broadly classified into four categories



**(I) Profitability Ratios based on Sales :**

- (a) **Gross profit Ratio :**  
**Formula :**

$$\frac{\text{Gross Profit}}{\text{Sales}} \times 100$$

**Interpretation :**

Gross profit margin depends on the relationship between sales price, volume and costs. A high Gross Profit Margin is a favourable sign of good management.



**Question 10 – RM Ltd.**

RM Ltd. had recorded sales of Rs. 10,00,000 and cost of goods of Rs. 8,00,000. Calculate G.P.Ratio from the information given.

- (b) **Operating Net Profit And Net Profit Ratio :**  
**Formula :**

$$(i) \quad \text{Op. Net Profit Ratio} = \frac{\text{Operating Net Profit}}{\text{Net Sales}} \times 100$$
$$(ii) \quad \text{Net Profit Ratio} = \frac{\text{Net Profit(Before tax)}}{\text{Net Sales}} \times 100$$

Operating Net Profit = Gross Profit Less Operating Expenses.

- (c) **Operating Profit Ratio :**  
**Formula :**

$$\text{Operating Ratio} = \frac{\text{Cost of Goods sold} + \text{Operating Expenses}}{\text{Net Sales}} \times 100$$

- (d) **Expenses Ratio :**  
**Formula :**

$$\frac{\text{Expenses}}{\text{Net Sales}} \times 100$$



**Question 11 – RM Ltd.**

Re-arrange the following Profit and Loss Account of RM Ltd. in a form suitable for analysis and calculate profitability ratios :

**Profit and Loss Account for  
the year ended 31st March, 2022**

Particulars	Rs.	Particulars	Rs.
To Opening inventories	75,000	By Sales	5,00,000
To Purchases	1,50,000	By Closing Inventories	1,25,000
To Manufacturing Expenses	50,000	By Profit on sale of Shares	25,000
To Direct Wages	1,00,000		
To Administrative Expenses	25,000		
To Selling Expenses	25,000		
To Loss on Sales of Assets	27,500		
To Interest on Debentures	5,000		
To Net Profit	1,92,500		
<b>Total</b>	<b>6,50,000</b>	<b>Total</b>	<b>6,50,000</b>

**(II) Profitability Ratios related to Overall Return on Assets/ Investments :**

**(a) Return on Capital Employed (ROCE):**

Formula :

$$\frac{\text{Net Profit (Before Interest and Tax)}}{\text{Total Funds Employed or Total Net Assets}} \times 100$$

Interpretation :

ROCE should always be higher than the rate at which the company borrows. Intangible assets (assets which have no physical existence like goodwill, patents and trade-marks) should be included in the capital employed. But no fictitious asset (such as deferred expenses) should be included within capital employed. If information is available, then average capital employed shall be taken.

**(b) Return on Assets (ROA):**

Formula :

$$\text{Return on Proprietor's Funds} = \frac{\text{Net profit (after tax)}}{\text{Proprietor's Funds}} \times 100$$

**Components :**

**Proprietor's funds would include :**

	(i) Equity Capital	xx
<b>Add:</b>	(ii) Preference Capital	xx
<b>Add:</b>	(iii) Reserves & Surplus	xx
<b>Less:</b>	Profit & Loss A/c Dr. Balance (loss)	xx
<b>Less:</b>	Fictitious Assets (Misc. Expenses)	xx

(c) **Return on Equity (ROE):**  
**Formula :**

$$\text{Return on Equity Capital} = \frac{\text{Profit available for Equity Shareholders (i.e.N.P.after tax less Preference dividend)}}{\text{Paid up Equity Capital}} \times 100$$

$$\text{Return on Equity Shareholders Fund} = \frac{\text{N.P.(After tax less Preference dividend)}}{\text{Equity Shareholders Fund}} \times 100$$

**Interpretation :**

Return on equity is one of the most important indicators of a firm's profitability and potential growth. Companies that boast a high return on equity with little or no debt are able to grow without large capital expenditures, allowing the owners of the business to withdraw cash and reinvest it elsewhere. Many investors fail to realize, however, that two companies can have the same return on equity, yet one can be a much better business. If return on total shareholders (i.e. equity and preference shareholder) is calculated, then Net Profit after taxes (before preference dividend) shall be divided by total shareholders' fund including preference share capital.



**Question 12**

**Profit and Loss Account for the year ended 31st March, 2022.**

Particulars	Rs.	Particulars	Rs.
To Admn. Expenses	20,000	By Gross Profit	1,00,000
To Selling & Dist. expenses	30,000	By Income from investments	5,000
To Interest on Deb.	5,000		
To Prov. for Tax	25,000		
To Net profit C/d	25,000		
	<b>1,05,000</b>		<b>1,05,000</b>

**Balance Sheet (Extract) as on 31st March, 2022**

	Rs.
<b>Share Capital :</b>	
10,000 Equity Shares of Rs.10 each fully paid	1,00,000
<b>Reserves:</b>	
General Reserves	10,000
Capital Redemption Reserve	5,000
Dividend Equalization Fund	5,000
Profit and loss Account	5,000
<b>Borrowed funds :</b>	
12% Debentures	75,000

	2,00,000
--	----------

Calculate

- (i) Return on capital employed
- (ii) Return on proprietors funds / Return on equity
- (iii) Return on equity shareholder funds
- (iv) Return on equity share capital.

**(III) Profitability Ratios Required for Analysis from Owner’s Point of View :**

**(a) Earnings per Share (EPS):**

**Formula :**

$$E.P.S. = \frac{\text{Net Profit available for Equity Shareholders}}{\text{Number of Equity Shares}}$$



**Question 13**

Compute earning per equity share from the data given below :

	Rs.
Eq. Share Capital (Rs. 10 each)	10,00,000
Net profit (before Tax)	5,50,000
10% Preference share capital	3,00,000
Rate of Tax	50%

**(b) Dividend per Share (DPS) :**

**Formula :**

$$D.P.S. = \frac{\text{Dividend to equity shareholders}}{\text{Number of Share}}$$

**(c) Dividend Pay-out Ratio (DP) :**

**Formula :**

$$D/P = \frac{\text{Dividend per Equity Share}}{\text{Earning per Equity Share}} \times 100$$



**Question 14**

	Rs.
10% Preference Share Capital	5,00,000
Eq.share capital (2,00,000 equity shares)	20,00,000
Net Profit (after tax)	7,50,000
Dividend paid on Equity shares @ 20%	
Find the D/P Ratio.	



**(IV) Profitability Ratios related to market/ valuation/ Investors :**

**(a) Price- Earnings Ratio (P/E Ratio):**

**Formula :**

$$\text{P/E Ratio} = \frac{\text{Market Price of a Share}}{\text{Earning per Equity Share}}$$

**Interpretation :**

It indicates the payback period to the investors or prospective investors. A higher P/E ratio could either mean that a company's stock is over-valued or the investors are expecting high growth rates in future.



**Question 15**

E.P.S. is Rs. 12, Market price is Rs. 240/- per share. Find Price Earnings Ratio.



**Question 16**

E.P.S. Rs.8, P.E. Ratio 12. Find market price of equity share.

**(b) Dividend and Earning Yield :**

**Formula :**

$$\text{Dividend Yield} = \frac{\text{Dividend} \pm \text{Change in share price}}{\text{Initial Share Price}} \times 100$$

$$= \frac{\text{Dividend Share (DPS)}}{\text{Market Price per Share (MPS)}} \times 100$$

$$\text{Earning Yield or EP Ratio} = \frac{\text{Earnings per Share (EPS)}}{\text{Market Price per Share (MPS)}} \times 100$$

**Interpretation :**

This ratio indicates return on investment; this may be on average investment or closing investment. Dividend (%) indicates return on paid up value of shares. But yield (%) is the indicator of true return in which share capital is taken at its market value.

**(c) Market Value /Book Value per Share (MV/BV):**

It provides evaluation of how investors view the company's past and future performance.

Formula :

$$\text{Market Value /Book Value per Share (MV/BV)} = \frac{\text{Average Share Price}}{\text{Net worth} \div \text{No.of equity Shares}}$$

Or,

$$\frac{\text{Closing Share Price}}{\text{Net worth} \div \text{No.of equity Shares}}$$

Interpretation :

This ratio indicates market response of the shareholders' investment. Undoubtedly, higher the ratio, better is the shareholders' position in terms of return and capital gains.

(d) Q Ratio:

This ratio is proposed by James Tobin, a ratio is defined as

Formula :

$$\text{Q Ratio} = \frac{\text{Market Value of equity and liabilities}}{\text{Estimated replacement cost of assets}}$$

Or,

$$= \frac{\text{Market Value of a Company}}{\text{Assets' Replacement cost}}$$

Thus, this ratio represents the relationship between market valuation and intrinsic value. Equilibrium is when Q Ratio = 1 because when it is less than 1, it could mean that the stock is undervalued and when it is more than 1, it could mean that stock is overvalued.

#### 4. USERS AND OBJECTIVE OF FINANCIAL ANALYSIS :

Financial Statement analysis is useful to various shareholders to obtain the derived information about the firm.

S.No.	Users	Objectives	Ratios used in general
1	Shareholders	Being owners of the organisation they are interested to know about profitability and growth of the organization	Mainly Profitability Ratios [In particular Earning per share (EPS), Dividend per share (DPS), Price Earnings (P/E), Dividend Payout ratio (DP)]
2	Investors	They are interested to know overall financial health of the organisation particularly future perspective of the organisations.	<ul style="list-style-type: none"> <li>• Profitability Ratios</li> <li>• Capital structure Ratios</li> <li>• Solvency Ratios</li> <li>• Turnover Ratios</li> </ul>

3	Lenders	They will keep an eye on the safety perspective of their money lent to the organisation	<ul style="list-style-type: none"> <li>• Coverage Ratios</li> <li>• Solvency Ratios</li> <li>• Turnover Ratios</li> <li>• Profitability Ratios</li> </ul>
4	Creditors	They are interested to know liability position of the organisation particularly in short term. Creditors would like to know whether the organisation will be able to pay the amount on due date.	<ul style="list-style-type: none"> <li>• Liquidity Ratios</li> <li>• Short term solvency Ratios/ Liquidity Ratios</li> </ul>
5	Employees	They will be interested to know the overall financial wealth of the organisation and compare it with competitor company.	<ul style="list-style-type: none"> <li>• Liquidity Ratios</li> <li>• Long terms solvency Ratios</li> <li>• Profitability Ratios</li> <li>• Return on investment</li> </ul>
6	Regulator / Government	They will analyse the financial statements to determine taxations and other details payable to the government.	<ul style="list-style-type: none"> <li>• Profitability Ratios</li> </ul>
7	Managers		
	(a) Production Managers	They are interested know about data regarding input output, production quantities etc.	<ul style="list-style-type: none"> <li>• Input output Ratio</li> <li>• Raw material consumption ratio.</li> </ul>
	(b) Sales Managers	Data related to units sold for various years, other associated figures and predicted future sales figure will be an area of interest for them	<ul style="list-style-type: none"> <li>• Turnover ratios (basically receivable turnover ratio)</li> <li>• Expenses Ratios</li> </ul>
	(c) Financial Manager	They are interested to know various ratios for their future predictions of financial requirement.	<ul style="list-style-type: none"> <li>• Profitability Ratios (particularly related to Return on investment)</li> <li>• Turnover ratios</li> <li>• Capital Structure Ratios</li> </ul>
	(d) Chief Executive/ General Manager	They will try to assess the complete perspective of the company, starting from Sales, Finance, Inventory, Human resources, Production etc.	<ul style="list-style-type: none"> <li>• All Ratios</li> </ul>
8	Different Industry		

(a) Telecom	Finance Manager /Analyst will calculate ratios of their company and compare it with Industry norms.	<ul style="list-style-type: none"> <li>Ratio related to 'call'</li> <li>Revenue and expenses per customer</li> </ul>
(b) Bank		<ul style="list-style-type: none"> <li>Loan to deposit Ratios</li> <li>Operating expenses and income ratios</li> </ul>
(c) Hotel		<ul style="list-style-type: none"> <li>Room occupancy ratio</li> <li>Bed occupancy Ratios</li> </ul>
(d) Transport		<ul style="list-style-type: none"> <li>Passenger – kilometre</li> <li>Operating cost - per passenger kilometre.</li> </ul>

## 5. APPLICATION OF RATIO ANALYSIS IN FINANCIAL DECISION MAKING :

A popular technique of analysing the performance of a business concern is that of financial ratio analysis. As a tool of financial management, they are of crucial significance. The importance of ratio analysis lies in the fact that it presents facts on a comparative basis and enables drawing of inferences regarding the performance of a firm. Ratio analysis is relevant in assessing the performance of a firm in respect of following aspects:

### Financial Ratios for Evaluating Performance :

- (a) **Liquidity Position :** With the help of ratio analysis one can draw conclusions regarding liquidity position of a firm. The liquidity position of a firm would be satisfactory if it is able to meet its obligations when they become due. This ability is reflected in the liquidity ratios of a firm. The liquidity ratios are particularly useful in credit analysis by banks and other suppliers of short-term loans.
- (b) **Long-term Solvency :** Ratio analysis is equally useful for assessing the long-term financial viability of a firm. This aspect of the financial position of a borrower is of concern to the long term creditors, security analysts and the present and potential owners of a business.  
 The long term solvency is measured by the leverage/capital structure and profitability ratios which focus on earning power and operating efficiency.  
 The leverage ratios, for instance, will indicate whether a firm has a reasonable proportion of various sources of finance or whether it is heavily loaded with debt in which case its solvency is exposed to serious strain.  
 Similarly, the various profitability ratios would reveal whether or not the firm is able to offer adequate return to its owners consistent with the risk involved.
- (c) **Operating Efficiency :** Ratio analysis throws light on the degree of efficiency in the management and utilisation of its assets.  
 The various activity ratios measure this kind of operational efficiency. In fact, the solvency of a firm is, in the ultimate analysis, dependent upon the sales revenues generated by the use of its assets – total as well as its components.
- (d) **Overall Profitability :** Unlike the outside parties which are interested in one aspect of the financial position of a firm, the management is constantly concerned about the overall profitability of the enterprise. That is, they are concerned about the ability of the firm to meet its short-term as well as long-term obligations to its creditors, to ensure a reasonable return to its owners and secure optimum utilisation of the assets

of the firm. This is possible if an integrated view is taken and all the ratios are considered together.

- (e) **Inter-firm Comparison :** Ratio analysis not only throws light on the financial position of a firm but also serves as a stepping stone to remedial measures. This is made possible due to inter-firm comparison/comparison with industry averages. A single figure of particular ratio is meaningless unless it is related to some standard or norm. One of the popular techniques is to compare the ratios of a firm with the industry average. It should be reasonably expected that the performance of a firm should be in broad conformity with that of the industry to which it belongs. An inter-firm comparison would demonstrate the relative position vis-a-vis its competitors. If the results are at variance either with the industry average or with those of the competitors, the firm can seek to identify the probable reasons and, in the light, take remedial measures. Ratios not only perform post mortem of operations, but also serve as barometer for future. Ratios have predictor value and they are very helpful in forecasting and planning the business activities for a future. Conclusions are drawn on the basis of the analysis obtained by using ratio analysis. The decisions affected may be whether to supply goods on credit to a concern, whether bank loans will be made available, etc.
- (f) **Financial Ratios for Budgeting :** In this field ratios are able to provide a great deal of assistance. Budget is only an estimate of future activity based on past experience, in the making of which the relationship between different spheres of activities are invaluable. It is usually possible to estimate budgeted figures using financial ratios. Ratios also can be made use of for measuring actual performance with budgeted estimates. They indicate directions in which adjustments should be made either in the budget or in performance to bring them closer to each other.

## 6. LIMITATIONS OF FINANCIAL RATIOS :

The limitations of financial ratios are listed below:

- (i) **Diversified product lines :** Many businesses operate a large number of divisions in quite different industries. In such cases ratios calculated on the basis of aggregate data cannot be used for inter-firm comparisons.
- (ii) **Financial data are badly distorted by inflation :** Historical cost values may be substantially different from true values. Such distortions of financial data are also carried in the financial ratios.
- (iii) **Seasonal factors :** It may also influence financial data.  
**Example :** A company deals in cotton garments. It keeps a high inventory during October - January every year. For the rest of the year its inventory level becomes just 1/4th of the seasonal inventory level.  
So, the liquidity ratios and inventory ratios will produce biased picture. Year end picture may not be the average picture of the business. Sometimes it is suggested to take monthly average inventory data instead of year end data to eliminate seasonal factors. But for external users it is difficult to get monthly inventory figures. (Even in some cases monthly inventory figures may not be available).
- (iv) **To give a good shape to the popularly used financial ratios (like current ratio, debt-equity ratios, etc.):** The business may make some year-end adjustments. Such window dressing can change the character of financial ratios which would be different had there been no such change.

- (v) **Differences in accounting policies and accounting period:** It can make the accounting data of two firms non-comparable as also the accounting ratios.
- (vi) **No standard set of ratios against which a firm's ratios can be compared:** Sometimes a firm's ratios are compared with the industry average. But if a firm desires to be above the average, then industry average becomes a low standard. On the other hand, for a below average firm, industry averages become too high a standard to achieve.
- (vii) **Difficulty to generalise whether a particular ratio is good or bad:** For example, a low current ratio may be said 'bad' from the point of view of low liquidity, but a high current ratio may not be 'good' as this may result from inefficient working capital management.
- (viii) **Financial ratios are inter-related, not independent:** Viewed in isolation one ratio may highlight efficiency. But when considered as a set of ratios they may speak differently. Such interdependence among the ratios can be taken care of through multivariate analysis (analyzing the relationship between several variables simultaneously).

**Financial ratios provide clues but not conclusions.** These are tools only in the hands of experts because there is no standard ready-made interpretation of financial ratios.

## 7. PRACTICAL PROBLEMS :



### Question 17 – HPCL Ltd.

In a meeting held at Solan towards the end of 2019-20, the Directors of HPCL Ltd. have taken a decision to diversify. At present HPCL Ltd. sells all finished goods from its own warehouse. The company issued debentures on 01.04.2020 and purchased fixed assets on the same day. The purchase prices have remained stable during the concerned period. Following information is provided to you:

#### INCOME STATEMENT

Particulars	2019-20 (Rs.)		2020-21 (Rs.)	
	Cash Sales	30,000		32,000
Credit Sales	2,70,000	3,00,000	3,42,000	3,74,000
Less: Cost of goods sold		<u>2,36,000</u>		<u>2,98,000</u>
Gross profit		64,000		76,000
Less: Operating Expenses:				
Warehousing	13,000		14,000	
Transport	6,000		10,000	
Administrative	19,000		19,000	
Selling	11,000	49,000	14,000	57,000
Net Profit		15,000		19,000

#### Balance Sheet

Assets & Liabilities	2019-20 (Rs.)		2020-21 (Rs.)	
Fixed Assets (Net Block)		30,000		40,000
Receivables	50,000		82,000	
Cash at Bank	10,000		7,000	
Stock	60,000		94,000	
Total Current Assets (CA)	<u>1,20,000</u>		<u>1,83,000</u>	
Payables	50,000		76,000	
Total Current Liabilities (CL)	50,000		76,000	
Working Capital (CA - CL)		70,000		1,07,000

Net Assets		1,00,000		1,47,000
<b>Represented by:</b>				
Share Capital		75,000		75,000
Reserve and Surplus		25,000		42,000
Debentures				30,000
		1,00,000		1,47,000

You are required to CALCULATE the following ratios for the years 2019-20 and 2020-21:

- (i) Gross Profit Ratio
- (ii) Operating Expenses to Sales Ratio
- (iii) Operating Profit Ratio
- (iv) Capital Turnover Ratio
- (v) Stock Turnover Ratio
- (vi) Net Profit to Net Worth Ratio
- (vii) Receivables Collection Period

Ratio relating to capital employed should be based on the capital at the end of the year. Give the reasons for change in the ratios for 2 years. Assume opening stock of Rs. 40,000 for the year 2019-20. Ignore Taxation.



### Question 18 – Alpha Ltd.

Following is the abridged Balance Sheet of Alpha Ltd.:

Liabilities	Rs.	Assets	Rs.	Rs.
Share Capital	1,00,000	Land and Buildings		80,000
Profit and Loss Account	17,000	Plant and Machineries	50,000	
Current Liabilities	40,000	Less: Depreciation	15,000	35,000
		Stock	21,000	1,15,000
		Receivables	20,000	
		Bank	1,000	42,000
<b>Total</b>	<b>1,57,000</b>	<b>Total</b>		<b>1,57,000</b>

With the help of the additional information furnished below, you are required to PREPARE Trading and Profit & Loss Account and Balance Sheet as at 31st March, 2021:

- (i) The company went in for re-organisation of capital structure, with share capital remaining the same as follows:

Share capital	50%
Other Shareholders' funds	15%
5% Debentures	10%
Current Liabilities	25%

- (ii) Debentures were issued on 1st April, interest being paid annually on 31st March. Land and Buildings remained unchanged. Additional plant and machinery has been bought and a further Rs. 5,000 depreciation was written off. (The total fixed assets then constituted 60% of total fixed and current assets.)
- (iii) Working capital ratio was 8 : 5.
- (iv) Quick assets ratio was 1 : 1.
- (v) The receivables (four-fifth of the quick assets) to sales ratio revealed a credit period of 2 months. There were no cash sales.



- (vi) Return on net worth was 10%.
  - (vii) Gross profit was at the rate of 15% of selling price.
  - (viii) Stock turnover was eight times for the year.
- Ignore Taxation.



**Question 19 - X Co.**

X Co. has made plans for the next year. It is estimated that the company will employ total assets of Rs. 8,00,000; 50 per cent of the assets being financed by borrowed capital at an interest cost of 8 per cent per year. The direct costs for the year are estimated at Rs. 4,80,000 and all other operating expenses are estimated at Rs. 80,000. The goods will be sold to customers at 150 per cent of the direct costs. Tax rate is assumed to be 50 per cent. You are required to CALCULATE: (i) Operating profit margin (before tax); (ii) net profit margin (after tax); (iii) return on assets (on operating profit after tax); (iv) asset turnover and (v) return on owners' equity.



**Question 20 – Aebece Company**

From the following ratios and information given below, PREPARE Trading Account, Profit and Loss Account and Balance Sheet of Aebece Company:

Fixed Assets	Rs. 40,00,000
Closing Stock	Rs. 4,00,000
Stock turnover ratio	10
Gross profit ratio	25 percent
Net profit ratio	20 percent
Net profit to capital	1/5
Capital to total liabilities	1/2
Fixed assets to capital	5/4
Fixed assets/Total current assets	5/7



**Question 21 – ABC Company**

ABC Company sells plumbing fixtures on terms of 2/10, net 30. Its financial statements over the last 3 years are as follows:

Particulars	2018-19	2019-20	2020-21
	Rs.	Rs.	Rs.
Cash	30,000	20,000	5,000
Accounts receivable	2,00,000	2,60,000	2,90,000
Inventory	4,00,000	4,80,000	6,00,000
	6,30,000	7,60,000	8,95,000
Net fixed assets	8,00,000	8,00,000	8,00,000
	14,30,000	15,60,000	16,95,000
	Rs.	Rs.	Rs.
Accounts payable	2,30,000	3,00,000	3,80,000
Accruals	2,00,000	2,10,000	2,25,000
Bank loan (short-term)	1,00,000	1,00,000	1,40,000
	5,30,000	6,10,000	7,45,000



Long-term debt	3,00,000	3,00,000	3,00,000
Common stock	1,00,000	1,00,000	1,00,000
Retained earnings	5,00,000	5,50,000	5,50,000
	14,30,000	15,60,000	16,95,000
	<b>Rs.</b>	<b>Rs.</b>	<b>Rs.</b>
Sales	40,00,000	43,00,000	38,00,000
Cost of goods sold	32,00,000	36,00,000	33,00,000
Net profit	3,00,000	2,00,000	1,00,000

Considering opening balance of Accounts Receivable and Inventory as 2,00,000 and 4,00,000 respectively as on 01.04.2018, ANALYSE the company's financial condition and performance over the last 3 years. Are there any problems?



**Question 22 – Navya Ltd.**

Following information are available for Navya Ltd. along with various ratios relevant to the particular industry it belongs to. APPRAISE your comments on strength and weakness of Navya Ltd. comparing its ratios with the given industry norms.

**Navya Ltd.**

**Balance Sheet as at 31.3.2021**

Liabilities	Amount (Rs.)	Assets	Amount (Rs.)
Equity Share Capital	48,00,000	Fixed Assets	24,20,000
10% Debentures	9,20,000	Cash	8,80,000
Sundry Creditors	6,60,000	Sundry debtors	11,00,000
Bills Payable	8,80,000	Stock	33,00,000
Other current Liabilities	4,40,000		
<b>Total</b>	<b>77,00,000</b>	<b>Total</b>	<b>77,00,000</b>

**Statement of Profitability  
For the year ending 31.3.2021**

Particulars	Amount (Rs.)	Amount (Rs.)
Sales		1,10,00,000
Less: Cost of goods sold:		
Material	41,80,000	
Wages	26,40,000	
Factory Overhead	12,98,000	81,18,000
Gross Profit		28,82,000
Less: Selling and Distribution Cost	11,00,000	
Administrative Cost	12,28,000	23,28,000
Earnings before Interest and Taxes		5,54,000
Less: Interest Charges		92,000
Earning before Tax		4,62,000
Less: Taxes @ 50%		2,31,000
Net Profit (PAT)		2,31,000

**Industry Norms**

Ratios	Norm
Current Ratio	2.5

Receivables Turnover Ratio	8.0
Inventory Turnover Ratio (based on Sales)	9.0
Total Assets Turnover Ratio	2.0
Net Profit Ratio	3.5%
Return on Total Assets (on EBIT)	7.0%
Return on Net worth (Based on Net profit)	10.5%
Total Debt/Total Assets	60.0%



**Question 23**

The total sales (all credit) of a firm are Rs. 6,40,000. It has a gross profit margin of 15 per cent and a current ratio of 2.5. The firm’s current liabilities are Rs. 96,000; inventories Rs. 48,000 and cash Rs. 16,000.

- (a) DETERMINE the average inventory to be carried by the firm, if an inventory turnover of 5 times is expected? (Assume 360 days a year).
- (b) DETERMINE the average collection period if the opening balance of debtors is intended to be of Rs. 80,000? (Assume 360 days a year).



**Question 24 – Beta Limited**

The capital structure of Beta Limited is as follows:

Equity share capital of Rs. 10 each	8,00,000
9% preference share capital of Rs. 10 each	3,00,000
	11,00,000

Additional information: Profit (after tax at 35 per cent) Rs. 2,70,000; Depreciation Rs.60,000; Equity dividend paid 20 per cent; Market price of equity shares Rs. 40.

You are required to COMPUTE the following, showing the necessary workings:

- (a) Dividend yield on the equity shares
- (b) Cover for the preference and equity dividends
- (c) Earnings per shares
- (d) Price-earnings ratio



**Question 25 – PQR Ltd.**

The following accounting information and financial ratios of PQR Ltd. relates to the year ended 31st March, 2021 :

<b>I</b>	<b>Accounting Information:</b>	
	Gross Profit	15% of Sales
	Net profit	8% of sales
	Raw materials consumed	20% of works cost
	Direct wages	10% of works cost
	Stock of raw materials	3 months’ usage
	Stock of finished goods	6% of works cost
	Debt collection period (All sales are on credit)	60 days
<b>II</b>	<b>Financial Ratios:</b>	
	Fixed assets to sales	1 : 3
	Fixed assets to Current assets	13 : 11

Current ratio	2 : 1
Long-term loans to Current liabilities	2 : 1
Share Capital to Reserves and Surplus	1 : 4

If value of Fixed Assets as on 31st March, 2020 amounted to Rs. 26 lakhs, PREPARE a summarised Profit and Loss Account of the company for the year ended 31st March, 2021 and also the Balance Sheet as on 31st March, 2021.



**Question 26 - Ganpati Limited**

Ganpati Limited has furnished the following ratios and information relating to the year ended 31st March, 2021:

Sales	Rs. 60,00,000
Return on net worth	25%
Rate of income tax	50%
Share capital to reserves	7:3
Current ratio	2
Net profit to sales	6.25%
Inventory turnover (based on cost of goods sold)	12
Cost of goods sold	Rs. 18,00,000
Interest on debentures	Rs. 60,000
Receivables	Rs. 2,00,000
Payables	Rs. 2,00,000

You are required to:

- (a) CALCULATE the operating expenses for the year ended 31st March, 2021.
- (b) PREPARE a Balance Sheet as on 31st March in the following format:

**Balance Sheet as on 31st March, 2021**

Liabilities	Rs.	Assets	Rs.
Share Capital		Fixed Assets	
Reserve and Surplus		Current Assets	
15% Debentures		Stock	
Payables		Receivables	
		Cash	



**Question 27**

Using the following information, PREPARE the balance sheet:

Long-term debt to net worth	0.5
Total asset turnover	2.5
Average collection period*	18 days
Inventory turnover	9
Gross profit margin	10%
Acid-test ratio	1

\*Assume a 360-day year and all sales on credit.

	Rs.		Rs.
Cash	?	Notes and payables	1,00,000
Accounts receivable	?	Long-term debt	?
Inventory	?	Common stock	1,00,000
Plant and equipment	?	Retained earnings	1,00,000
Total assets	?	Total liabilities and equity	?



**Question 28 – Laxmi Pvt. Ltd.**

Following information has been provided from the books of Laxmi Pvt. Ltd. for the year ending on 31st March, 2021:

Net Working Capital	Rs. 4,80,000
Bank overdraft	Rs. 80,000
Fixed Assets to Proprietary ratio	0.75
Reserves and Surplus	Rs. 3,20,000
Current ratio	2.5
Liquid ratio (Quick Ratio)	1.5

You are required to PREPARE a summarised Balance Sheet as at 31st March, 2021 assuming that there is no long term debt.



**Question 29 – Manan Pvt. Ltd.**

Manan Pvt. Ltd. gives you the following information relating to the year ending 31st March, 2021:

(1)	Current Ratio	2.5 : 1
(2)	Debt-Equity Ratio	1:1.5
(3)	Return on Total Assets (After Tax)	15%
(4)	Total Assets Turnover Ratio	2
(5)	Gross Profit Ratio	20%
(6)	Stock Turnover Ratio	7
(7)	Net Working Capital	Rs.13,50,000
(8)	Fixed Assets	Rs.30,00,000
(9)	1,80,000 Equity Shares of	Rs.10 each
(10)	60,000, 9% Preference Shares of	Rs.10 each
(11)	Opening Stock	Rs.11,40,000

You are required to CALCULATE:

- Quick Ratio
- Fixed Assets Turnover Ratio
- Proprietary Ratio
- Earnings per Share



**Question 30 – Gig Ltd.**

Gig Ltd. has furnished the following information relating to the year ended 31st March, 2020 and 31st March, 2021:

	(Rs.)	
	31st March, 2020	31st March, 2021
Share Capital	40,00,000	40,00,000
Reserve and Surplus	20,00,000	25,00,000
Long term loan	30,00,000	30,00,000

- Net profit ratio: 8%
- Gross profit ratio: 20%
- Long-term loan has been used to finance 40% of the fixed assets.
- Stock turnover with respect to cost of goods sold is 4.
- Debtors represent 90 days sales.
- The company holds cash equivalent to 1½ months cost of goods sold.
- Ignore taxation and assume 360 days in a year.

You are required to PREPARE Balance Sheet as on 31st March, 2021 in the following format:

Liabilities	(Rs.)	Assets	(Rs.)
Share Capital	-	Fixed Assets	-
Reserve and Surplus	-	Sundry Debtors	-
Long-term loan	-	Closing Stock	-
Sundry Creditors	-	Cash in hand	-



**Question 31 – Termer Ltd.**

Following information relates to Termer Ltd.:

Debtors Velocity	3 months
Creditors Velocity	2 months
Stock Turnover Ratio	1.5
Gross Profit Ratio	25%
Bills Receivables	Rs. 25,000
Bills Payables	Rs. 10,000
Gross Profit	Rs. 4,00,000
Fixed Assets turnover Ratio	4

Closing stock of the period is Rs. 10,000 above the opening stock.

DETERMINE:

- (i) Sales and cost of goods sold
- (ii) Sundry Debtors
- (iii) Sundry Creditors
- (iv) Closing Stock
- (v) Fixed Assets

## 8. SUMMARY OF RATIOS :

Another way of categorizing the ratios is being shown to you in a tabular form. A summary of the ratios has been tabulated as under:

Ratio	Formulae	Interpretation
<b>Liquidity Ratio</b>		
Current Ratio	$\frac{\text{Current Assets}}{\text{Current Liabilities}}$	A simple measure that estimates whether the business can pay short term debts. Ideal ratio is 2.
Quick Ratio	$\frac{\text{Quick Assets}}{\text{Current Liabilities}}$	It measures the ability to meet current debt immediately. Ideal ratio is 1.
Cash Ratio	$\frac{(\text{Cash Bank balances} + \text{Marketable Securities})}{\text{Current Liabilities}}$	It measures absolute liquidity of the business.
Basic Defense Interval Ratio	$\frac{(\text{Cash Bank balances} + \text{Net Receivables} + \text{Marketable Securities})}{\text{Opening Expenses} \div \text{No. of days}}$	It measures the ability of the business to meet regular cash expenditures.
Net Working Capital	Current Assets – Current Liabilities	It is a measure of cash flow to determine the ability of business to survive financial crisis.
<b>Capital Structure Ratio</b>		
Equity Ratio	$\frac{\text{Shareholders' Equity}}{\text{Net Assets}}$	It indicates owner's fund in companies to total fund invested.
Debt Ratio	$\frac{\text{Total Debt}}{\text{Net Assets}}$	It is an indicator of use of outside funds.
Debt to equity Ratio	$\frac{\text{Total Debt}}{\text{Shareholders' Equity}}$	It indicates the composition of capital structure in terms of debt and equity.
Debt to Total Assets Ratio	$\frac{\text{Total Debt}}{\text{Total Assets}}$	It measures how much of total assets is financed by the debt.
Capital Gearing Ratio	$\frac{(\text{Preference Share Capital} + \text{Debentures} + \text{Other Borrowed Funds})}{(\text{Equity Share Capital} + \text{Reserves and Surplus} - \text{Losses})}$	It shows the proportion of fixed interest bearing capital to equity shareholders' fund. It also signifies the advantage of financial leverage to the equity shareholder.
Proprietary Ratio	$\frac{\text{Proprietary Fund}}{\text{Total Assets}}$	It measures the proportion of total assets financed by shareholders.
<b>Coverage Ratios</b>		
Debt Service Coverage Ratio (DSCR)	$\frac{\text{Earnings available for debt services}}{\text{Interest} + \text{Instalments}}$	It measures the ability to meet the commitment of various debt services like interest, instalment etc. Ideal ratio is 2.
Interest Coverage Ratio	$\frac{\text{EBIT}}{\text{Interest}}$	It measures the ability of the business to meet interest obligations. Ideal ratio is > 1.

Preference Dividend Coverage Ratio	$\frac{\text{Net Profit/Earnings after taxes (EAT)}}{\text{Preference dividend liability}}$	It measures the ability to pay the preference shareholders' dividend. Ideal ratio is > 1.
Fixed Charges Coverage Ratio	$\frac{\text{EBIT} + \text{Depreciation}}{\text{Interest} + \text{Repayment of loan}}$	This ratio shows how many times the cash flow before interest and taxes covers all fixed financing charges. The ideal ratio is > 1.
<b>Activity Ratio/ Efficiency Ratio/ Performance Ratio/ Turnover Ratio</b>		
Total Asset Turnover Ratio	$\frac{\text{Sales} / \text{Cost of Goods Sold}}{\text{Average Total Assets}}$	A measure of total asset utilisation. It helps to answer the question - What sales are being generated by each rupee's worth of assets invested in the business?
Fixed Assets Turnover Ratio	$\frac{\text{Sales} / \text{Cost of Goods Sold}}{\text{Fixed Assets}}$	This ratio is about fixed asset capacity. A reducing sales or profit being generated from each rupee invested in fixed assets may indicate overcapacity or poorer-performing equipment.
Capital Turnover Ratio	$\frac{\text{Sales} / \text{Cost of Goods Sold}}{\text{Net Assets}}$	This indicates the firm's ability to generate sales per rupee of long term investment.
Working Capital Turnover Ratio	$\frac{\text{Sales} / \text{Cost of Goods Sold}}{\text{Working Capital}}$	It measures the efficiency of the firm to use working capital.
Inventory Turnover Ratio	$\frac{\text{Cost of Goods Sold} / \text{Sales}}{\text{Average Inventory}}$	It measures the efficiency of the firm to manage its inventory.
Debtors Turnover Ratio	$\frac{\text{Credit Sales}}{\text{Average Accounts Receivables}}$	It measures the efficiency at which firm is managing its receivables.
Receivables (Debtors') Velocity	$\frac{\text{Average Accounts Receivables}}{\text{Average Daily Credit Sales}}$	It measures the velocity of collection of receivables.
Payables Turnover Ratio	$\frac{\text{Annual Net Credit Purchases}}{\text{Average Account Payables}}$	It measures how fast a company makes payment to its creditors.
Payables Velocity	$\frac{\text{Average Account Payables}}{\text{Average Daily Credit Purchases}}$	It measures the velocity of payment of payables.
<b>Profitability Ratios based on Sales</b>		
Gross Profit Ratio	$\frac{\text{Gross Profit}}{\text{Sales}} \times 100$	This ratio tells us something about the business's ability consistently to control its production costs or to manage the margins it makes on products it buys and sells.
Net Profit Ratio	$\frac{\text{Net Profit}}{\text{Sales}} \times 100$	It measures the relationship between net profit and sales of the business.



Operating Profit Ratio	$\frac{\text{Operating Profit}}{\text{Sales}} \times 100$	It measures operating performance of business.
<b>Expenses Ratio</b>		
Cost of Goods Sold (COGS) Ratio	$\frac{\text{COGS}}{\text{Sales}} \times 100$	)It measures portion of a particular expenses in comparison to sales.
Operating Expenses Ratio	$\frac{(\text{Administrative exp.} + \text{Selling and Distribution Overhead})}{\text{Sales}}$	
Operating Ratio	$\frac{\text{COGS} + \text{Operating Expenses}}{\text{Sales}} \times 100$	
Financial Expenses Ratio	$\frac{\text{Financial Expenses}}{\text{Sales}} \times 100$	
<b>Profitability Ratios related to Overall Return on Assets/ Investments</b>		
Return on Investment (ROI)	$\frac{\text{Return/Profit/Earnings}}{\text{Investments}} \times 100$	It measures overall return of the business on investment/ equity funds/capital employed/ assets.
Return on Assets (ROA)	$\frac{\text{Net Profit After Taxes}}{\text{Average Total Assets}}$	It measures net profit per rupee of average total assets/average tangible assets/average fixed assets.
Return on Capital Employed ROCE (Pre-tax)	$\frac{\text{EBIT}}{\text{Capital Employed}} \times 100$	It measures overall earnings (either pre-tax or post tax) on total capital employed.
Return on Capital Employed ROCE (Post-tax)	$\frac{\text{EBIT}(1 - t)}{\text{Capital Employed}} \times 100$	It indicates earnings available to equity shareholders in comparison to equity shareholders' net worth.
Return on Equity (ROE)	$\frac{(\text{Net Profit after taxes} - \text{Preference dividend (if any)})}{\text{Net worth/equity shareholders' fund}} \times 100$	
<b>Profitability Ratios Required for Analysis from Owner's Point of View</b>		
Earnings per Share (EPS)	$\frac{\text{Net profit available to equity shareholders}}{\text{Number of equity shares outstanding}}$	EPS measures the overall profit generated for each share in existence over a particular period.
Dividend per Share (DPS)	$\frac{\text{Dividend paid to equity shareholders}}{\text{Number of equity shares outstanding}}$	Proportion of profit distributed per equity share.
Dividend payout Ratio (DP)	$\frac{\text{Dividend per equity share}}{\text{Earnings Per Share (EPS)}}$	It shows % of EPS paid as dividend and retained earnings.
<b>Profitability Ratios related to market/ valuation/ Investors</b>		
Price-Earnings per Share (P/E Ratio)	$\frac{\text{Market Price Per Share (MPS)}}{\text{Earnings Per Share (EPS)}}$	At any time, the P/E ratio is an indication of how highly the market "rates" or "values" a business. A P/E ratio is best viewed in the context of



		a sector or market average to get a feel for relative value and stock market pricing.
Dividend Yield	$\frac{\text{Dividend} + \text{Change in share price}}{\text{Initial Share Price}} \times 100$ <p style="text-align: center;">Or</p> $\frac{\text{Dividend Per Share(DPS)}}{\text{Market Price Per Share(MPS)}} \times 100$	It measures dividend paid based on market price of shares.
Earnings Yield	$\frac{\text{Earnings Per Share(EPS)}}{\text{Initial Share Price}} \times 100$	It is the relationship of earning per share and market value of shares.
Market Value /Book Value per Share	$\frac{\text{Market Value Per Share}}{\text{Book Value Per Share}}$	It indicates market response of the shareholders' investment.
Q Ratio	$\frac{\text{Market Value of Equity and Liabilities}}{\text{Estimated Replacement Cost of Assets}}$	It measures market value of equity as well as debt in comparison to all assets at their replacement cost.

Students may note that now a company is also required to disclose the following ratios in the notes to accounts while preparing Financial Statements:

- |                                    |                                       |
|------------------------------------|---------------------------------------|
| (a) Current Ratio,                 | (b) Debt-Equity Ratio,                |
| (c) Debt Service Coverage Ratio,   | (d) Return on Equity Ratio,           |
| (e) Inventory turnover ratio,      | (f) Trade Receivables turnover ratio, |
| (g) Trade payables turnover ratio, | (h) Net capital turnover ratio,       |
| (i) Net profit ratio,              | (j) Return on Capital employed,       |
| (k) Return on investment.          |                                       |

Thanks ....



## CHP - 5

# Cost of Capital



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### CONCEPTS COVERED

1. INTRODUCTION
2. CONCEPT OF COST OF CAPITAL
3. IMPORTANCE AND SIGNIFICANCE
4. COMPONENT OF CAPITAL
  - (A) COST OF DEBT
  - (B) COST OF PREFERENCE
  - (C) COST OF EQUITY
  - (D) COST OF RESERVES
5. WEIGHTED AVERAGE COST OF CAPITAL
6. MARGINAL COST OF CAPITAL
7. SNAP SHOT
8. PRACTICE QUESTIONS



## 1. INTRODUCTION :

We know that the basic task of a finance manager is procurement of funds and its effective utilization. Whereas objective of financial management is maximization of wealth. Here wealth or value is equal to performance divided by expectations. Therefore, the finance manager is required to select **such a capital structure** in which expectation of investors is minimum hence shareholders' wealth is maximum. For that purpose, first he needs to calculate cost of various sources of finance. In this chapter we will learn to calculate cost of debt, cost of preference shares, cost of equity shares, cost of retained earnings and also overall cost of capital.

## 2. CONCEPT OF COST OF CAPITAL :

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

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

## 3. IMPORTANCE AND SIGNIFICANCE :

### a) Maximization of shareholders wealth:

Every firm should look to maximize shareholders wealth. If a firm's actual rate of return exceeds its cost of capital then the wealth maximization goal will be achieved. The reason for this is obvious, if the firm's return is more than its cost of capital, then the investor will no doubt be receiving their expected rate of return from the firm.

### b) Financial plan or capital structure :

The finance manager will always be interested in the concept of cost of capital while designing its capital structure. He would be interested to collect the funds from the cheapest source. The finance manager all around the world is interested in designing a capital structure which is most economical.

### c) Capital budgeting decision :

The cost of capital when used as a discount rate in capital budgeting, helps accepting only those proposals whose rate of return is more than the cost of capital of the firm and hence results in increasing the value of the firm. Similarly, the firm's value is reduced when the rate of return on the proposal falls below the cost of capital. The firm should accept an investment proposal only if it provides return to cover the cost of capital.

### d) Criteria to evaluate economic value added by firm :

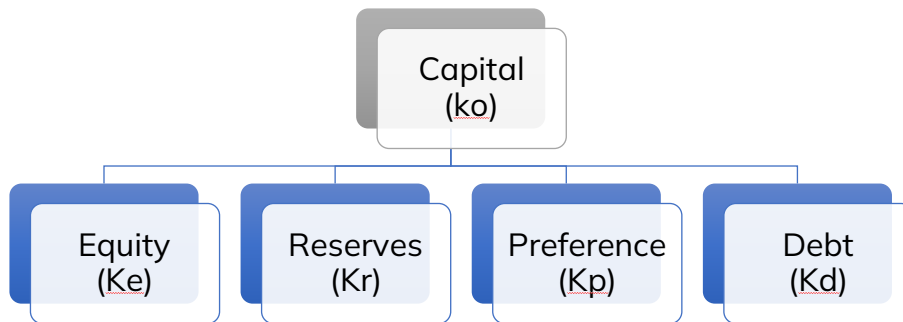
The concept of cost of capital is also used to calculate economic value added by firm. Economic value added by firm is excess of the earnings of company over its cost of

capital. It is an indicator to companies performance. The performance is said to be positive and satisfactory if company earning are higher than cost of capital.

e) **Helps to understand interest risk of capital structure :**

It allows firm to calculate the interest risk of the capital structure of the company. The firm with higher cost of capital is required to earn higher to maintain its capital structure. The firm should design a flexible capital structure and also look it keep its cost economical.

**4. COMPONENT OF CAPITAL :**



(A) **COST OF DEBT :**

External borrowings or debt instruments do not confer ownership to the providers of finance. The providers of the debt fund do not participate in the affairs of the company but enjoy the charge on the profit before taxes. Long term debt includes long term loans from the financial institutions, capital from issuing debentures or bonds etc. (In Chapter-2, we had already discussed in detail about the sources of long-term debt.) The calculation of cost of loan from a financial institution is similar to that of redeemable debentures. Here, we will confine our discussion of cost of debt to debentures or bonds only.

**Cost of Irredeemable Debentures :**

The debentures which are not redeemed by the issuer of the debentures is known as irredeemable debentures. Cost of debentures not redeemable during the life time of the company is calculated as below:

$$K_d = \frac{I}{NP} (1 - t)$$

Where,

- $K_d$  = Cost of debt after tax
- $I$  = Annual interest payment
- $NP$  = Net proceeds of debentures or Current market price
- $t$  = Tax rate



### Question 1

A company issues 15% irredeemable debentures of Rs.1,00,000. The tax rate applicable to the company is 50%. Calculate the cost of debt if the debentures are issued (i) at par (ii) at 10% premium (iii) at 10% discount.



### Question 2

Five years ago, Sona Limited issued 12 per cent irredeemable debentures at Rs. 103, at Rs. 3 premium to their par value of Rs. 100. The current market price of these debentures is Rs. 94. If the company pays corporate tax at a rate of 35 per cent CALCULATE its current cost of debenture capital?

### Cost of Redeemable Debentures (using approximation method) :

The cost of redeemable debentures will be calculated as below:

$$\text{Cost of Redeemable Debenture (K}_d\text{)} = \frac{I(1-t) + \frac{(RV-NP)}{n}}{\frac{(RV+NP)}{2}}$$

Where,

- I = Interest payment
- NP = Net proceeds or Current market price
- RV = Redemption value of debentures
- t = Tax rate applicable to the company
- n = Remaining life of debentures



### Question 3

A company issued 10,000, 10% debentures of Rs. 100 each at a premium of 10% on 1.4.2017 to be matured on 1.4.2022. The debentures will be redeemed on maturity. COMPUTE the cost of debentures assuming 35% as tax rate.

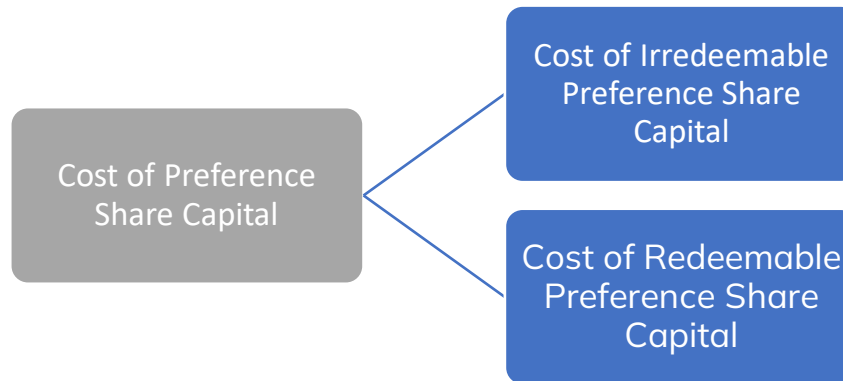


### Question 4

A company issued 10,000, 10% debentures of Rs. 100 each at par on 1.4.2012 to be matured on 1.4.2022. The company wants to know the cost of its existing debt on 1.4.2017 when the market price of the debentures is Rs. 80. COMPUTE the cost of existing debentures assuming 35% tax rate.

### (B) COST OF PREFERENCE :

The preference shareholders are paid dividend at a specified rate on face value of preference shares. Payment of dividend to the preference shareholders are not mandatory but are given priority over the equity shareholder. The payment of dividend to the preference shareholders are not charged as expenses but treated as an appropriation of after-tax profit. Hence, dividend paid to preference shareholders does not reduce the tax liability of the company. Like the debentures, Preference share capital can also be categorised as redeemable and irredeemable.



**Cost of Irredeemable Preference Shares :**

The cost of irredeemable preference shares is similar to the calculation of perpetuity. The cost of irredeemable preference share is calculated by dividing the preference dividend with the current market price or net proceeds from the issue. The cost of irredeemable preference share is as below:

$$\text{Cost of Irredeemable Preference Shares } (K_P) = \frac{PD}{P_0}$$

Where,

PD = Annual preference dividend

P<sub>0</sub> = Net proceeds from issue of preference shares



**Question 5**

A company raised preference share capital of Rs.1,00,000 by issue of 10% preference shares of Rs.10 each. Calculate the cost of preference capital when they are issued (i) At par (2) 10% premium (3) 10% discount.



**Question 6 – XYZ & Co.**

XYZ & Co. issues 2,000 10% preference shares of Rs. 100 each at Rs. 95 each. CALCULATE the cost of preference shares.



**Question 7 – R Energy**

If R Energy is issuing preferred stock at Rs. 100 per share, with a stated dividend of Rs. 12, and a floatation cost of 3% then, CALCULATE the cost of preference share?

**Cost of Redeemable Preference Shares :**

Preference shares issued by a company which are redeemed on its maturity is called as redeemable preference shares. Cost of redeemable preference share is similar to the cost of redeemable debentures with the exception that the dividends paid to the preference shareholders are not tax deductible. Cost of preference capital is calculated as follows:

$$\text{Cost of Redeemable Preference Shares (K}_p\text{)} = \frac{\text{PD} + \frac{(\text{RV}-\text{NP})}{n}}{\frac{(\text{RV}+\text{NP})}{2}}$$

Where,

- PD = Annual preference dividend
- RV = Redemption value of preference shares
- NP = Net proceeds from issue of preference shares
- n = Remaining life of preference shares



**Question 8 – XYZ Ltd.**

XYZ Ltd. issues 2,000 10% preference shares of Rs. 100 each at Rs. 95 each. The company proposes to redeem the preference shares at the end of 10th year from the date of issue. CALCULATE the cost of preference share?



**Question 9**

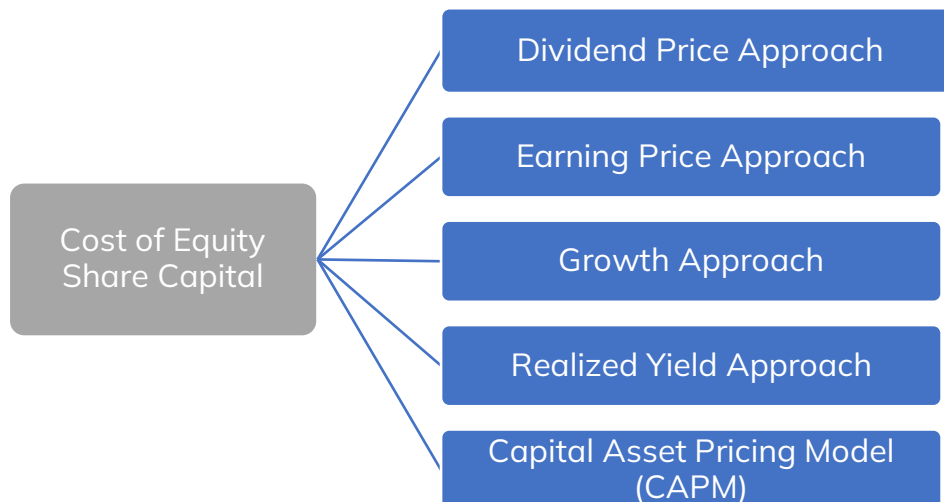
A company raised preference share capital of Rs.1,00,000 by issue of 10% preference shares of Rs.10 each. They are redeemable at the end of the 10th year from the year of their issue. The underwriting cost came to 2%. Calculate the effective cost of preference share capital.



**Question 10 – Tari Ltd.**

Tari Ltd issues 2,000 10% preference shares of Rs.1000 each at a discount of 5%. These preference shares are redeemable after 10 years at a premium of 10%. Calculate the cost of preference shares.

**(C) COST OF EQUITY :**



**Dividend Price Approach :**

This is also known as Dividend Valuation Model. This model makes an assumption that the dividend per share is expected to remain constant forever. Here, cost of equity capital is computed by dividing the expected dividend by market price per share as follows:

$$\text{Cost of Equity (K}_e\text{)} = \frac{D}{P_0}$$

Where,

- K<sub>e</sub> = Cost of equity
- D = Expected dividend (also written as D1)
- P<sub>0</sub> = Market price of equity (ex- dividend)



**Question 11 – Shah Sugars Ltd.**

Shah Sugars Ltd. issues 5,00,000 equity shares of Rs.10 each at a premium of 50%. The company is paying dividend @40% to equity shareholders for past 10 years and expects to maintain the same in to future also.



**Question 12 – Rahul Ltd.**

Rahul Ltd. offers for public subscription equity shares of Rs.10/- each at a premium of 10%. The company pays 5% of the issue price as underwriting commission. The rate of dividend expected by the equity shareholders is 20%. You are required to calculate the cost of equity capital.

**Earnings Price Approach :**

$$\text{Cost of Equity (K}_e\text{)} = \frac{E}{P}$$

Where,

- E = Current earnings per share
- P = Market price per share



**Question 13 – Krishna Ltd.**

Krishna Ltd. issued 4,000 equity shares of Rs.100 each as fully paid. The company has earned a profit of Rs.1, 00,000 after tax. The market price of these shares is Rs.200 per share. The co. has dividend at the rate of 15%.

Calculate : (a) Dividend approach (b) Earning approach

**Growth Approach or Gordon’s Model :**

As per this approach, the rate of dividend growth remains constant. Where, earnings, dividends and equity share price all grow at the same rate, the cost of equity capital may be computed as follows:



$$\text{Cost of Equity (K}_e\text{)} = \frac{D_1}{P_0} + g$$

Where,

- $D_1$  =  $[D_0 (1+ g)]$  i.e. next expected dividend  
 $P_0$  = Current Market price per share  
 $g$  = Constant Growth Rate of Dividend



#### Question 14

A company has paid dividend of Rs. 1 per share (of face value of Rs. 10 each) last year and it is expected to grow @ 10% every year. CALCULATE the cost of equity if the market price of share is Rs. 55.



#### Question 15

The current market price of an equity share of a company is Rs.90. The current dividend per share is Rs.4.50. In case the dividends are expected to grow at the rate of 7%, calculate the cost of equity capital.

#### Yield Approach Realized :

According to this approach, the cost of equity capital should be determined on the basis of return actually realised by the investors in a company on their equity shares. Thus, according to this approach the past records in a given period regarding dividends and the actual capital appreciation in the value of the equity shares held by the shareholders should be taken to compute the cost of equity capital.

This approach gives fairly good results in case of companies with stable dividends and growth records. In case of such companies, it can be assumed with reasonable degree of certainty that the past behavior will be repeated in future also.

This approach is not suitable for the companies where the earnings do not remain stable.



#### Question 16 – Mr. Mehra

Mr. Mehra had purchased a share of Alpha Limited for Rs. 1,000. He received dividend for a period of five years at the rate of 10 percent. At the end of the fifth year, he sold the share of Alpha Limited for Rs. 1,128. You are required to COMPUTE the cost of equity as per realised yield approach.

#### Capital Asset Pricing Model (CAPM) Approach :

CAPM model describes the risk-return trade-off for securities. It describes the linear relationship between risk and return of securities.

The risk to which a security is exposed, can be classified into two groups:

- (i) **Unsystematic Risk :** This is also called company specific risk as the risk is related with the company's performance. This type of risk can be reduced or eliminated by diversification of the securities portfolio. This is also known as diversifiable risk.

- (ii) **Systematic Risk** : It is the macro-economic or market specific risk under which a company operates. This type of risk cannot be eliminated by the diversification hence, it is non-diversifiable. The examples are inflation, Government policy, interest rate etc.

The cost of equity capital can be calculated under this approach as:

$$\text{Cost of Equity (K}_e\text{)} = R_f + \beta (R_m - R_f)$$

Where,

$K_e$	=	Cost of equity capital
$R_f$	=	Risk free rate of return
$\beta$	=	Beta coefficient
$R_m$	=	Rate of return on market portfolio
$(R_m - R_f)$	=	Market risk premium



**Question 17 – H Ltd.**

CALCULATE the cost of equity capital of H Ltd., whose risk-free rate of return equals 10%. The firm’s beta equals 1.75 and the return on the market portfolio equals to 15%.



**Question 18 – Nisha Limited**

Nisha Limited wishes to calculate its cost of capital using the CAPM approach. From the information provided to the firm by its investment advisors along with the firms own analysis it is found that the risk free rate of return equals 10%, the firms beta equals 1.50 and the return on the market portfolio equals 12.5%. Compute the cost of equity capital.

**P. E Model :**

One can calculate cost of equity by using PE model. Here cost of capital is reverse of PE i.e. 1/PE or EPS/MPS.



**Question 19**

Calculate cost of equity from the following information :

EPS = Rs.4

MPS = Rs.80

**Summary :**

	Approach	Formulae
1.	Dividend price approach	$\frac{D_p}{N_p}$
2.	Dividend price + Growth (D/P + g) approach	$\frac{D}{N_p} + g$
3.	Earning price (E/P) approach	$\frac{E}{N_p}$
4.	Realized yield approach	

5.	Earnings price plus growth (E/P + G) approach	$\frac{E}{M_p} + g$
6.	Capital assets pricing model (APM) approach	$R_f + B(R_m - R_f)$
7.	P.E. model	1/PE or EPS / MPS

**(D) COST OF RESERVES :**

The companies generally do not distribute the entire profits earned by them by way of dividend among their shareholders. Some profits are retained by them for future expansion of the business. Many people feel that such retained earnings are absolutely cost free. This is not the correct approach because the amount retained by company, if it had been distributed among the shareholders by way of dividend, would have given them some earning. The company has deprived the shareholders of this earnings by retaining a part of profit with it. Thus, cost of retained earnings is the earning forgone by the shareholders. In other words, the opportunity cost of retained earnings may be taken as the cost of the retained earning.

It is then very apt to say that cost of retained earnings is equivalent to calculation of cost of equity.  $K_r = K_e$ .



**Question 20**

Face value of equity shares of a company is Rs. 10, while current market price is Rs. 200 per share. Company is going to start a new project, and is planning to finance it partially by new issue and partially by retained earnings. You are required to CALCULATE cost of equity shares as well as cost of retained earnings if issue price will be Rs. 190 per share and floatation cost will be Rs. 5 per share. Dividend at the end of first year is expected to be Rs. 10 and growth rate will be 5%.



**Question 21 – ABC Company**

ABC Company provides the following details:

$D_0 = \text{Rs. } 4.19$        $P_0 = \text{Rs. } 50$        $g = 5\%$

CALCULATE the cost of retained earnings.



**Question 22 – ABC Company**

ABC Company provides the following details:

$R_f = 7\%$        $\beta = 1.20$        $R_m - R_f = 6\%$

CALCULATE the cost of retained earnings based on CAPM method.

**5. WEIGHTED AVERAGE COST OF CAPITAL :**

The overall cost of capital of the firm i.e, the weighted average cost of capital (WACC) depends upon the specific cost of capital of individual sources of finance and the proportion of different sources in the total structure of the firm. One financing mix or capital structure is represented by one WACC which may change wherever there is change in the financing mix. So, a firm can change its WACC by changing the financing mix and can thus affect the value of the firm. It may be noted that the cost of capital and the value of the firm are inversely related. For a given level of earnings, lower the cost of capital, the higher would be the value of firm.

Calculation of weighted average cost

The calculation requires preparation of following table :

Source	Amt.	Prop.	Cost	Wt. Cost.
1	2	3	4	5
Equity	Xx	xx	xx	xx
Reserves	Xx	xx	xx	xx
Preference Capital	Xx	xx	xx	xx
Debenture	xx	xx	xx	xx
	xx	100		xx



**Question 23**

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

Source	Book Value	Market Value
Equity share capital of Rs. 10/- each	45,000	90,000
Retained Earnings	15,000	-
Preference Share Capital	10,000	10,000
Debentures	30,000	30,000

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

- Equity share capital 14%
- Retained earnings 13%
- Preference Share capital 10%
- Debentures 5%



**Question 24 – Calculate the WACC**

CALCULATE the WACC using the following data by using:

- (a) Book value weights
- (b) Market value weights

The capital structure of the company is as under:

	(Rs.)
Debentures (Rs. 100 per debenture)	5,00,000
Preference shares (Rs. 100 per share)	5,00,000
Equity shares (Rs. 10 per share)	10,00,000
	20,00,000

The market prices of these securities are:

- Debentures Rs. 105 per debenture
- Preference shares Rs. 110 per preference share
- Equity shares Rs. 24 per equity share

Additional information:

- (1) Rs. 100 per debenture redeemable at par, 10% coupon rate, 4% floatation costs, 10-year maturity.
- (2) Rs. 100 per preference share redeemable at par, 5% coupon rate, 2% floatation cost and 10-year maturity.
- (3) Equity shares has Rs. 4 floatation cost and market price of Rs. 24 per share.

The next year expected dividend is Rs. 1 with annual growth of 5%. The firm has practice of paying all earnings in the form of dividend.  
Corporate tax rate is 30%. Use YTM method to calculate cost of debentures and preference shares



### Question 25 – ABC Ltd.

ABC Ltd. wishes to raise additional finance of Rs. 20 lakhs for meeting its investment plans. The company has Rs.4,00,000 in the form of retained earnings available for investment purposes.

The following are the further details:

- ◆ Debt equity ratio 25 : 75.
- ◆ Cost of debt at the rate of 10 percent (before tax) upto Rs.2,00,000 and 13% (before tax) beyond that.
- ◆ Earning per share, Rs.12.
- ◆ Dividend payout 50% of earnings.
- ◆ Expected growth rate in dividend 10%.
- ◆ Current market price per share, Rs.60.
- ◆ Company's tax rate is 30% and shareholder's personal tax rate is 20%.

#### Required:

- (i) Calculate the post tax average cost of additional debt.
- (ii) Calculate the cost of retained earnings and cost of equity.
- (iii) Calculate the overall weighted average (after tax) cost of additional finance.

## 6. MARGINAL COST OF CAPITAL :

The marginal cost of capital may be defined as the cost of raising an additional rupee of capital. Since the capital is raised in substantial amount in practice, marginal cost is referred to as the cost incurred in raising new funds. Marginal cost of capital is derived, when the average cost of capital is **calculated using the marginal weights**. The marginal weights represent the proportion of funds the firm intends to employ. Thus, the problem of choosing between the book value weights and the **market value weights** does not arise in the case of marginal cost of capital computation. To calculate the marginal cost of capital, the intended financing proportion should be applied as weights to marginal component costs. The marginal cost of capital should, therefore, be calculated in the composite sense. When a firm raises funds in proportional manner and the component's cost remains unchanged, there will be no difference between average cost of capital (of the total funds) and the marginal cost of capital. The component costs may remain constant upto certain level of funds raised and then start increasing with amount of funds raised. For example, the cost of debt may remain 7% (after tax) till Rs. 10 lakhs of debt is raised, between Rs. 10 lakhs and Rs. 15 lakhs, the cost may be 8% and so on.

Similarly, if the firm has to use the external equity when the retained profits are not sufficient, the cost of equity will be higher because of the floatation costs. When the components cost

start rising, the average cost of capital will rise and the marginal cost of capital will however, rise at a faster rate.



**Question 26 – ABC Ltd.**

ABC Ltd. has the following capital structure, which is considered to be optimum as on 31st March, 2022.

	Rs.
14% Debentures	30,000
11% Preference shares	10,000
Equity Shares (10,000 shares)	1,60,000
	2,00,000

The company share has a market price of Rs. 23.60. Next year dividend per share is 50% of year 2021 EPS. Following is the uniform trend of EPS for the preceding 10 years which is expected to continue in future:

Year	EPS (Rs.)	Year	EPS (Rs.)
2012	1	2017	1.61
2013	1.1	2018	1.77
2014	1.21	2019	1.95
2015	1.33	2020	2.15
2016	1.46	2021	2.36

The company issued new debentures carrying 16% rate of interest and the current market price of debenture is Rs. 96.

Preference shares of Rs. 9.20 (with annual dividend of Rs. 1.1 per share) were also issued. The company is in 50% tax bracket.

- (A) CALCULATE after tax:
  - (i) Cost of new debt
  - (ii) Cost of new preference shares
  - (iii) Cost of new equity share (assuming new equity from retained earnings)
- (B) CALCULATE marginal cost of capital when no new shares are issued.
- (C) DETERMINE the amount that can be spent for capital investment before new ordinary shares must be sold. Assuming that the retained earnings for next year's investment is 50 percent of 2021.
- (D) COMPUTE marginal cost of capital when the fund exceeds the amount calculated in (C), assuming new equity is issued at Rs. 20 per share?



**Question 27 – XYZ Ltd.**

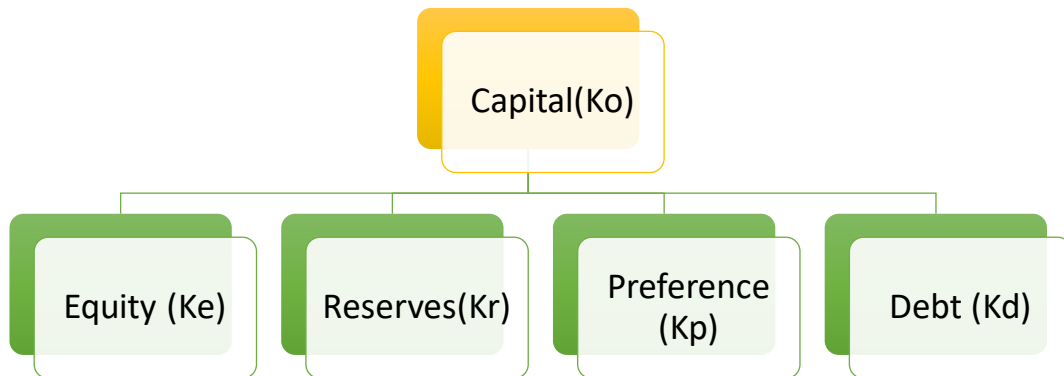
XYZ Ltd. has the following book value capital structure:

Equity Capital (in shares of Rs.10 each, fully paid up- at par)	Rs.15 crores
11% Preference Capital (in shares of Rs.100 each, fully paid up- at par)	Rs.1 crore
Retained Earnings	Rs.20 crores
13.5% Debentures (of Rs.100 each)	Rs.10 crores
15% Term Loans	Rs.12.5 crores

The next expected dividend on equity shares per share is Rs.3.60; the dividend per share is expected to grow at the rate of 7%. The market price per share is Rs.40. Preference stock, redeemable after ten years, is currently selling at Rs.75 per share. Debentures, redeemable after six years, are selling at Rs. 80 per debenture. The Income tax rate for the company is 40%.

- (i) Required  
Calculate the weighted average cost of capital using:
- book value proportions; and
  - market value proportions.
- (ii) Define the weighted marginal cost of capital schedule for the company, if it raises Rs.10 crores next year, given the following information:
- the amount will be raised by equity and debt in equal proportions;
  - the company expects to retain Rs.1.5 crores earnings next year;
  - the additional issue of equity shares will result in the net price per share being fixed at Rs.32;
  - the debt capital raised by way of term loans will cost 15% for the first Rs.2.5 crores and 16% for the next Rs.2.5 crores.

7. SNAP SHOT :



Component	Approach	Formulae
Cost of Debt (Kd)	Irredeemable	$= \frac{I(1-t)}{Np}$
	Redeemable	$= \frac{i(1-t) + (Rv - Np) / n}{(Rv + Np) / 2}$
Cost of Preference (Kp)	Irredeemable	$= \frac{Dp}{Np}$
	Redeemable	$= \frac{Dp + (Rv - Np) / n}{(Rv + Np) / 2}$
Cost of Equity (Ke)	Dividend Price	$= \frac{Dp}{mp}$
	Dividend Price + Growth	$= \frac{D}{mp} + g$

	Earning price	$= \frac{E}{Np}$
	Earning Price + Growth	$= \frac{E}{Np} + g$
	CAPM	$= R_f + \beta(R_m - R_f)$
	P.E	$= 1/pe \text{ or } EPS / mps$
Cost of Reserves (kr)		$= Ke(1 - tp) (1 - B)$

## 8. PRACTICE QUESTIONS :



### Question 28 – Gamma Limited

Gamma Limited has 5,00,000, Rs. 1 ordinary shares whose current ex-dividend market price is Rs. 1.50 per share. The company has just paid a dividend of 27 paise per share, and dividends are expected to continue at this level for some time. If the company has no debt capital, COMPUTE the weighted average cost of capital?



### Question 29 – GPS Limited

The following details are provided by the GPS Limited:

	Rs.
Equity Share Capital	65,00,000
12% Preference Share Capital	12,00,000
15% Redeemable Debentures	20,00,000
10% Convertible Debentures	8,00,000

The cost of equity capital for the company is 16.30% and income tax rate for the company is 30%.

You are required to CALCULATE the Weighted Average Cost of Capital (WACC) of the company.



### Question 30 – ABC Company's

ABC Company's equity share is quoted in the market at Rs. 25 per share currently. The company pays a dividend of Rs. 2 per share and the investor's market expects a growth rate of 6% per year.

You are required to:

- CALCULATE the company's cost of equity capital.
- If the company issues 10% debentures of face value of Rs. 100 each and realises Rs. 96 per debenture while the debentures are redeemable after 12 years at a premium of 12%, CALCULATE cost of debenture using YTM?

Assume Tax Rate to be 50%.





**Question 31 – Masco Limited**

Masco Limited wishes to raise additional finance of Rs. 10 lakhs for meeting its investment plans. It has Rs. 2,10,000 in the form of retained earnings available for investment purposes. Further details are as following:

(1)	Debt / Equity mix	3 : 7
(2)	Cost of debt:	
	Upto Rs. 1,80,000	10% (before tax)
	Beyond Rs. 1,80,000	16% (before tax)
(3)	Earnings per share	Rs.4
(4)	Dividend pay out	50% of earnings
(5)	Expected growth rate of dividend	10%
(6)	Current market price per share	Rs.44
(7)	Tax rate	50%

You are required to:

- (a) DETERMINE the pattern for raising the additional finance.
- (b) DETERMINE the post-tax average cost of additional debt.
- (c) DETERMINE the cost of retained earnings and cost of equity.
- (d) COMPUTE the overall weighted average after tax cost of additional finance.



**Question 32 – Best Luck Limited**

DETERMINE the cost of capital of Best Luck Limited using the book value (BV) and market value (MV) weights from the following information :

Sources	Book Value (Rs.)	Market Value (Rs.)
Equity shares	1,20,00,000	2,00,00,000
Retained earnings	30,00,000	–
Preference shares	36,00,000	33,75,000
Debentures	9,00,000	10,40,000

**Additional information:**

- I. Equity: Equity shares are quoted at Rs. 130 per share and a new issue priced at Rs. 125 per share will be fully subscribed; flotation costs will be Rs. 5 per share.
  - II. Dividend: During the previous 5 years, dividends have steadily increased from Rs. 10.60 to Rs. 14.19 per share. Dividend at the end of the current year is expected to be Rs. 15 per share.
  - III. Preference shares: 15% Preference shares with face value of Rs. 100 would realise Rs. 105 per share.
  - IV. Debentures: The company proposes to issue 11-year 15% debentures but the yield on debentures of similar maturity and risk class is 16%; flotation cost is 2%.
  - V. Tax: Corporate tax rate is 35%. Ignore dividend tax.
- Floatation cost would be calculated on face value.



**Question 33 – Kalyanam Ltd.**

Kalyanam Ltd. has an operating profit of Rs. 34,50,000 and has employed Debt which gives total Interest Charge of Rs. 7,50,000. The firm has an existing Cost of Equity and Cost of Debt as 16% and 8% respectively. The firm has a new proposal before it, which requires funds of Rs. 75 Lakhs and is expected to bring an additional profit of Rs. 14,25,000. To finance the proposal, the firm is expecting to issue an additional debt at 8% and will not be issuing any new equity shares in the market. Assume no tax culture. You are required to CALCULATE the Weighted Average Cost of Capital (WACC) of Kalyanam Ltd.:

- (i) Before the new Proposal
- (ii) After the new Proposal.

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Thanks ....



## CHP - 6

# Financing Decision – Leverages



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### CONCEPTS COVERED

1. INTRODUCTION
2. RISK
3. BUSINESS RISK AND FINANCIAL RISK
4. LEVERAGE
5. TYPES OF LEVERAGES
6. OPERATING LEVERAGE
7. FINANCIAL LEVERAGE
8. OPERATING LEVERAGE V/S FINANCIAL LEVERAGE
9. COMBINED LEVERAGE
10. SNAP SHOT
11. PRACTICAL QUESTIONS



## 1. INTRODUCTION :

A Firm or a business organization can raise funds through a combination of

- (a) Debt,
- (b) Preference Capital, and,
- (c) Equity Capital.

Equity Capital can be raised through owners [i.e. by issuing equity shares to them] or by retaining profits. Whereas, Debt can be raised from outside sources. A combination or a mix of these sources is called Capital Structure or Financial structure.

Every company (management) has to decide on its capital structure. These decisions are very important for the management of the company/firm. The risk return relationship is affected by each capital structure decision taken, i.e. whenever the capital structure is changed, it affects both debt and equity. Higher the debt, higher is the risk faced by the shareholders and higher is their expectations. On the other hand, lower the debt, lower is the risk faced by shareholders and higher are their returns. Thus the effects of various capital structure (i.e. Debt and equity) on the shareholders risk return relationship is called leverage.

Leverage in simple words can be known as “Risk”. It can also be viewed as a relationship between Profit and Sales. Therefore Leverage can be defined as relative change profits due to change in sales.

## 2. RISK :

Now let's elaborate the work risk. When the manufacturer produces the product, he face the risk of producing the product and not getting sold. The cost involved in producing the product can be classified into

- ✓ *Fixed Cost*
- ✓ *Variable Cost*

There is no risk in variable cost, because variable cost will be incurred only if the product is produced and the product will be produced only if we have orders. So the risk lies in Fixed Cost. This Fixed cost is further classified into

- ✓ *Operating Fixed Cost i.e Business Risk*
- ✓ *Interest Cost i.e Financial Risk*



- a) **Business risk :** It is the risk associated with of firm operation. It is the risk of Fixed Cost. It is variability of firm EBIT (Earning before interest and tax). It arises due to firm's internal and external environment. It is unavoidable risk. Such risk can be measured by calculating operating leverage. It (operating leverage) is not affected by capital

structure decision i.e. it is not affected by existence or increase or decrease in debt in capital structure.

- b) Financial risk :** It refers to the additional risk on for shareholders due to the use of debt in capital structure. It is the risk of interest. It is variability of firm EBT(Earnings Before Tax). Companies with higher debts have higher financial leverage. Firms can avoid such risk by using debt judiciously. Financially risk can be measured by calculating financial risk. It (financial risk) is affected by changes in capital structure.

### 3. DISTINGUIISH BETWEEN BUSINESS RISK AND FINANCIAL RISK :

	Business risk	Financial risk
<b>1</b>	<b>Meaning</b>	
	It is associated with the firms operations, and refers to the uncertainty about future Net Operating Income (EBIT)	It is the additional risk placed on Equity Shareholders due to the use of Debt. Funds
<b>2</b>	<b>Variability</b>	
	It is variability of EBIT.	It is variability of EBT.
<b>3</b>	<b>Nature of Risk</b>	
	It is an unavoidable risk.	It is an avoidable risk.
<b>4</b>	<b>Measurement</b>	
	It is measured using operating leverage.	It is measured using financial leverage.
<b>5</b>	<b>Change in Capital Structure</b>	
	Change in capital structure does not affect Business Risk.	Change in capital structures affects Financial risk.
<b>6</b>	<b>Linked to</b>	
	It is linked to Economic climate	It is linked to use of Debt Funds.

### 4. LEVERAGE :

The term leverage generally refers to a relationship between two interrelated variables. It helps in understanding the relationship between any two variables. The variables, for which the relationship is to be established and measured should be interrelated, otherwise the leverage studying may not have any useful purpose to serve.

The leverage, therefore can be defined as : = 
$$\frac{\% \Delta \text{ in one variable (dependant)}}{\% \Delta \text{ another variable (independant)}}$$

One should observe that dependent variable should be numerator and independent variable should be denominator.

For e.g. if the firm increases advertisement expenses from Rs.10000 to Rs.12000, i.e. increase by 20%, the sales in terms of units increases from 200 to 300 i.e. increase by 50%. Let see how can we measure it in leverage.

$$\text{Leverage} = \frac{\% \text{ change in sales}}{\% \text{ change in advertising}} = \frac{50}{20} = 2.5$$

We can interpret the above leverage as 20% change in advertisement expense, increases the sales by 2.5 times the change in advertisement expenses.

**5. TYPES OF LEVERAGES :**

To understand leverages, we first have to differentiate variable cost and fixed cost and further fixed cost should be classified into operating fixed cost and interest. This can done by splitting the income statement in following form

Sales	xx
– Variable cost	<u>xx</u>
Contribution	xx
– Fixed cost	<u>xx</u>
EBIT	xx
– Interest	<u>xx</u>
EBT	xx
– Tax	<u>xx</u>
EAT	xx
÷ No. of shares	<u>xx</u>
EPS	<u>xx</u>

For understanding the leverages involved, we split the chart into two.

Sales	xx
– Variable cost	<u>xx</u>
Contribution	xx
– Fixed cost	<u>xx</u>
EBIT	xx

**Fig 1**

EBIT	xx
– Interest	<u>xx</u>
EBT	xx
– Tax	<u>xx</u>
EAT	xx
÷ No. of shares	<u>xx</u>
EPS	<u>xx</u>

**Fig 2**

**OPERATING LEVERAGE :** Fig.1 shows that level of EBIT depends upon sales. The relationship of sales and EBIT can be measured by operating leverage.

**FINANCIAL LEVERAGE :** Fig.2 show that level EPS / EAT depends upon EBIT. The relationship of EBIT and EBT/EP S can be measured by financial leverage.

**6. OPERATING LEVERAGE :**

Definition :

Operating leverage is defined as the measure of risk of existence of Fixed Cost. It calculates the use of fixed operating cost to magnify the effects of changes in sales on its EBIT.

**Measurement :**

Operating Leverage (OL) =  $\frac{\% \Delta \text{ EBIT}}{\% \Delta \text{ Sales}}$  or  $\frac{\text{Contribution}}{\text{EBIT}}$

Sales	xx	
– Variable cost	<u>xx</u>	
Contribution	xx	
– Fixed cost	<u>xx</u>	
EBIT	xx	

Operating leverage result from existence of fixed operating expenses .



**Question 1 – Rahul Ltd.**

Rahul Ltd sells 8000 units per annum. The selling price per unit is 100 and variable cost is 80, fixed cost is 60000. Calculate operating leverage.



**Question 2 – A company**

A Company produces and sells 10,000 shirts. The selling price per shirt is Rs. 500. Variable cost is Rs. 200 per shirt and fixed operating cost is Rs. 25,00,000.

- (a) CALCULATE operating leverage.
- (b) If sales are up by 10%, then COMPUTE the impact on EBIT?



**Questions 3 – Four firms A, B, C & D**

CALCULATE the operating leverage for each of the four firms A, B, C and D from the following price and cost data :

	Firms			
	A (Rs.)	B (Rs.)	C (Rs.)	D (Rs.)
Sale price per unit	20	32	50	70
Variable cost per unit	6	16	20	50
Fixed operating cost	60,000	40,000	1,00,000	Nil

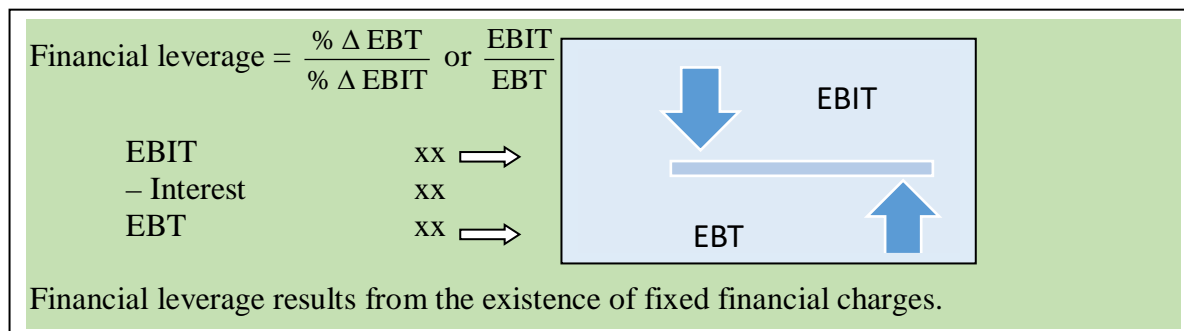
What calculations can you draw with respect to levels of fixed cost and the degree of operating leverage result? EXPLAIN. Assume number of units sold is 5,000.

**7. FINANCIAL LEVERAGE :**

**Definition :**

Financial leverage is defined as the ability of the co. to use fixed financial charges i.e. interest to magnify the effects of changes in its EBIT on the co. Earning before tax / after tax / EPS. It is to be noted that the EBT, EAT and EPS will change on same proportion i.e if EBT changes by 20%, then EAT and EPS will also change by 20%. (Assuming no preference dividend)

**Measurement :**



**Questions 4**

Calculate financial leverage from the following information :

Sales	10,00,000	(10,000 units)
Variable	6,00,000	
Fixed cost	1,00,000	
Interest	1,00,000	

**8. OPERATING LEVERAGE V/S FINANCIAL LEVERAGE :**

Operating Leverage is concerned with effect on change in sales on change on EBIT. Financial Leverage is concerned with effect of change in EBIT on change in EBT. OL is concerned with investment decision whereas FL is concerned with financing decisions. The difference between two leverages is as follows:

Operating leverage		Financial leverage	
1	<b>Definition</b>		
	OL is defined as an ability of Co. to magnify the effect on change in sales on change in EBIT.	FL is defined as an ability of Co. to magnify the effect of change in EBIT on change in EBT.	
2	<b>Relationship</b>		
	It establishes relationship between EBIT and sales.	It establishes relationship between EBIT and EBT.	
3	<b>Risk</b>		
	It measures operating risk. i.e Operating Fixed Cost	It measures financial risk. i.e Interest	
4	<b>Decision</b>		
	It is concerned with investment decision.	It is concerned with financial decision	
5	<b>Variable</b>		
	EBIT is dependent variable.	EBIT is independent variable.	
6	<b>Effect</b>		
	Operating Leverage affects EBIT	Financial Leverage affects EBT	
7	<b>Flexibility</b>		
	It cannot adjusted i.e. it is not flexible.	It can be adjusted, it is flexible	



8	<b>Desirability</b>	
	It is not flexible and hence not desirable.	It is flexible and hence desirable.

## 9. COMBINED LEVERAGE :

### Definition :

Combined leverage is a combination of operating leverage and financial leverage. Operating leverage explain business risk, whereas financial leverage deals with financial risk. Now to look into overall risk we have combined leverage. Combined leverage will measure the effect of change in sales level on the EPS of the company.

### Measurement :

$$CL = \frac{\% \Delta \text{ in contribution}}{\% \Delta \text{ change in EBT/EPS}} \quad \text{OR} \quad OL \times FL$$



### **Questions 5**

Calculate financial leverage, operating leverage and combined leverage with the help of following information :

Sales	40,00,000
Variable cost	10,00,000
Fixed cost	5,00,000
Interest	10,00,000

## 10. SNAP SHOT :

1.	Statement for EBIT – EPS	<table style="width: 100%; border-collapse: collapse;"> <tr><td style="width: 80%;">Sales</td><td style="text-align: right;">xx</td></tr> <tr><td>– Variable cost</td><td style="text-align: right;"><u>xx</u></td></tr> <tr><td>Contribution</td><td style="text-align: right;">xx</td></tr> <tr><td>– Fixed cost</td><td style="text-align: right;"><u>xx</u></td></tr> <tr><td>EBIT</td><td style="text-align: right;">xx</td></tr> <tr><td>– Interest</td><td style="text-align: right;"><u>xx</u></td></tr> <tr><td>EBT</td><td style="text-align: right;">xx</td></tr> <tr><td>– Tax</td><td style="text-align: right;"><u>xx</u></td></tr> <tr><td>EAT</td><td style="text-align: right;">xx</td></tr> <tr><td>– Pref. dividend</td><td style="text-align: right;"><u>xx</u></td></tr> <tr><td>Earnings for equity</td><td style="text-align: right;">xx</td></tr> </table>	Sales	xx	– Variable cost	<u>xx</u>	Contribution	xx	– Fixed cost	<u>xx</u>	EBIT	xx	– Interest	<u>xx</u>	EBT	xx	– Tax	<u>xx</u>	EAT	xx	– Pref. dividend	<u>xx</u>	Earnings for equity	xx
Sales	xx																							
– Variable cost	<u>xx</u>																							
Contribution	xx																							
– Fixed cost	<u>xx</u>																							
EBIT	xx																							
– Interest	<u>xx</u>																							
EBT	xx																							
– Tax	<u>xx</u>																							
EAT	xx																							
– Pref. dividend	<u>xx</u>																							
Earnings for equity	xx																							
2.	Operating Leverage	= $\frac{\text{Contribution}}{\text{EBIT}}$																						
3.	Financial Leverage	= $\frac{\text{EBIT}}{\text{EBT}}$																						
4.	Combined Leverage	= Operating Leverage X Financial Leverage																						
5.	% Δ Sales	= % Δ Contribution = % Δ variable cost																						
6.	% Δ EBIT	= % Δ Sales x Operating Leverage																						

7.	% Δ EBT	= % Δ EBIT × FL
8.	% Δ EBT	= % Δ EAT = % Δ EPS

## 11. PRACTICAL QUESTIONS :



### Question 6

A firm's details are as under:

Sales (@100 per unit)	Rs. 24,00,000
Variable Cost	50%
Fixed Cost	Rs. 10,00,000

It has borrowed Rs. 10,00,000 @ 10% p.a. and its equity share capital is Rs. 10,00,000 (Rs. 100 each).

Consider tax @ 50 %.

CALCULATE:

- Operating Leverage
- Financial Leverage
- Combined Leverage
- Return on Investment
- If the sales increases by Rs. 6,00,000; what will the new EBIT?



### Question 7 – Yizi Company Ltd.

The following information is related to Yizi Company Ltd. for the year ended 31st March, 2021:

Equity share capital (of Rs. 10 each)	Rs. 50 lakhs
12% Bonds of Rs. 1,000 each	Rs. 37 lakhs
Sales	Rs. 84 lakhs
Fixed cost (excluding interest)	Rs. 6.96 lakhs
Financial leverage	1.49
Profit-volume Ratio	27.55%
Income Tax Applicable	40%

You are required to CALCULATE:

- Operating Leverage;
- Combined leverage; and
- Earnings per share.

Show calculations up-to two decimal points.



### Question 8 – A Ltd. And B Ltd.

Following are the selected financial information of A Ltd. and B Ltd. for the year ended March 31st, 2021:

	A Ltd.	B Ltd.
Variable Cost Ratio	60%	50%
Interest	Rs. 20,000	Rs. 1,00,000
Operating Leverage	5	2
Financial Leverage	3	2
Tax Rate	30%	30%

You are required to FIND out:

- (i) EBIT
- (ii) Sales
- (iii) Fixed Cost
- (iv) Identify the company which is better placed with reasons based on leverages.



Wait! lets not rush through the questions. Before we go on the next question, it time to study something NEW.

Now since we know Operating Leverage and Financial Leverage – lets us understand the combinations of this leverages and their acceptance. Just keep one thing in mind “Operating Leverage is not desirable and Financial Leverage is desirable)

**Combination of leverages :**

OL	FL	Effect	Reasons
High	High	Risk	It implies high fixed cost and interest. Even a small change in sales will lead to large effect on EPS.
Low	Low	Conservative	It implies low fixed cost and interest. It means lower risk but it does not maximize the returns to equity share holders.
High	Low	Not ideal	High operating leverage and low financial leverage are set off against one another. However operating leverage is not flexible and cannot be changed. This means its not ideal.
Low	High	Ideal	This is ideal scenario. Its an perfect risk return trade off. It has low operating risk and higher financial risk which maximize the return to shareholders.



**Question 9**

Calculate the DOL, DFL, DCL from the following details :

Sales 2,00,000 units @ Rs.2 per unit – Rs.4,00,000, Variable cost per unit @ Rs.1.40, Fixed cost Rs.1,00,000, Interest Rate Rs.7,338.

Which combinations of operating and financial leverage constitute (a) Risky Situation and (b) Ideal Situation.



**Question 10**

You are given two financial plans of a company which has two financial situations. The detailed information are as under :

Installed Capacity	10,000 units
Actual Production and Sales	60% of installed capacity
Selling price per unit	Rs.30
Variable cost per unit	Rs.20
Fixed cost :	
Situation 'A'	= Rs.20,000
Situation 'B'	= Rs.25,000

Capital structure of the company is as follows :

	Financial Plans	
	XY	XM
	Rs.	Rs.
Equity	12,000	35,000
Debt (Cost of Debt. 12%)	40,000	10,000
	52,000	45,000

You are required to calculate operating leverage and financial leverage of both the plans.



**Question 11 – A firm**

A firm has sales of Rs.75 lakhs, variable cost of Rs.42 lakhs and fixed cost of Rs.6 lakhs. It has a debt of Rs.45 lakhs at 9% and equity of Rs.55 lakhs.

- (a) What is the firm's ROI ?
- (b) Does it have favourable financial leverage?
- (c) If the firm belongs to an industry whose asset turnover is 2, does it have high or low asset leverage?
- (d) What is the operating, financial and combined leverage of the firm?
- (e) If the sales upto Rs.50 lakhs, what will be the new EBIT?



**Question 12 – Company A and Company B**

From the following financial data of Company A and Company B: Prepare their Income Statements.

	Company A	Company B
	Rs.	Rs.
Variable Cost	56,000	60% of sales
Fixed Cost	20,000	-
Interest Expenses	12,000	9,000
Financial Leverage	5 : 1	-
Operating Leverage	-	4 : 1
Income Tax Rate	30%	30%
Sales	-	1,05,000



**NEW**Concept

Lets learn something new. Lets use this knowledge of leverage and use them to understand its impact on Contribution, EBIT, EBT and EPS. Some formulae based on %.



**Question 13**

If the %  $\Delta$  sales = 25%, OL = 3 times, FL = 2.5 times. Compute %  $\Delta$  contribution, %  $\Delta$  EBIT and %  $\Delta$  EBT.



**Question 14**

If %  $\Delta$  sales = 70%, %  $\Delta$  EBIT = 210%, %  $\Delta$  EBT 300%. Compute OL and FL.



**Question 15**

From the following information, calculate the % change in earning per share if sales are increase by 5%

Earning before interest and Tax (EBIT)	Rs. 1,200 lakhs
Profit Before Tax (EBT)	Rs. 320 lakhs
Fixed Cost	Rs. 700 lakhs



**Question 16**

A company produces and sells 10,000 shirts. The selling price per shirt is Rs. 500. Variable Cost is Rs. 200 per shirt and Fixed Operating Cost is Rs. 25,00,000.

- a) Calculate operating Leverage
- b) If sales are up 10%, then what is the impact on EBIT?



**Question 17 – Company U, T & V**

From the following prepare income statement of company U, T & V. Comment on each company’s performance.

Company	U	T	V
Financial leverage	3 : 1	4 : 1	2 : 1
Interest	10,000	15,000	50,000
Operating Leverage	4%	5%	3%
Variable Cost as % of Sales	66 2/3%	75%	50%
Income tax Rate	45%	45%	45%



**Question 18 – Mega Ltd.**

Consider the following information for Mega Ltd.:

Production level	2,500 units
Contribution per unit	Rs. 150
Operating leverage	6
Combined leverage	24
Tax rate	30%

Required:  
COMPUTE its earnings after tax.



**Question 19 – Betatronics Ltd.**

Betatronics Ltd. has the following balance sheet and income statement information:

**Balance Sheet as on March 31st 2021**

Liabilities	(Rs.)	Assets	(Rs.)
Equity capital (Rs. 10 per share)	8,00,000	Net fixed assets	10,00,000
10% Debt	6,00,000	Current assets	9,00,000
Retained earnings	3,50,000		
Current liabilities	1,50,000		
	<b>19,00,000</b>		<b>19,00,000</b>

**Income Statement for the year ending March 31st 2021**

Particulars	Rs.
Sales	3,40,000
Operating expenses (including Rs. 60,000 depreciation)	1,20,000
EBIT	2,20,000
Less: Interest	60,000
Earnings before tax	1,60,000
Less: Taxes	56,000
Net Earnings (EAT)	1,04,000

- (a) DETERMINE the degree of operating, financial and combined leverages at the current sales level, if all operating expenses, other than depreciation, are variable costs.
- (b) If total assets remain at the same level, but sales (i) increase by 20 percent and (ii) decrease by 20 percent, COMPUTE the earnings per share at the new sales level?

Thanks ....



## CHP - 7

# Capital Structure Decisions



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### CONCEPTS COVERED

1. INTRODUCTION
2. CAPITAL STRUCTURE
3. PRACTICAL QUESTIONS
4. INDIFFERENT POINTS
5. FINANCIAL BREAKPOINT



## 1. INTRODUCTION :

Every company needs finance to conduct the business. Finance requirements of the firms can be classified as long term requirements and short term requirements. The long term requirements can be raised by issues of capital i.e equity and preference and by raising debt and the short term finance i.e working capital finance can be raised through bank credit and other current liabilities.

In this chapter i.e capital structure decisions we are concerned with long term requirements of the company. It concentrates with the debt and equity funds of the company.

The firms should maintain the capital structure ie debt equity mix in such a way that its cost and risk are minimum and it also maximises the earnings and the value of the firm.

## 2. CAPITAL STRUCTURE :

Now before we proceed, we must note one point that capital structure is different from financial structure. Financial structure means the entire liability side of the balance sheet.

i.e Financial Structure = Long term sources + Short term Sources i.e (Long term Liabilities + Short Term Liabilities)

Whereas, Capital Structure refers to the mix of various sources of long term fund requirement of the company. It means the proportions of debt, preference capital and Equity Capital in the long term sources of the funds.

i.e. Capital Structure = Equity + Preference + Debt.

## 3. PRACTICAL QUESTIONS :



### Questions 1 – Modern Chemicals Ltd.

The Modern Chemicals Ltd. requires Rs.25,00,000 for a new plant. This plant is expected to yield earnings before interest and taxes of Rs.5,00,000. While deciding about the financial plan, the company considers the objective of maximising earnings per share. It has three alternatives to finance the project- by raising debt of Rs.2,50,000 or Rs.10,00,000 or Rs.15,00,000 and the balance, in each case, by issuing equity shares. The company's share is currently selling at Rs.150, but is expected to decline to Rs.125 in case the funds are borrowed in excess of Rs.10,00,000. The funds can be borrowed at the rate of 10% upto Rs.2,50,000, at 15% over Rs.2,50,000 and upto Rs.10,00,000 and at 20% over Rs.10,00,000. The tax rate applicable to the company is 50%. Which form of financing should the company choose?



### Question 2 – ABC Ltd.

The existing capital structure of ABC Ltd. is as follows :

	Rs.
Equity Shares of Rs.100 each	40,00,000
Retained Earnings	10,00,000
9% Preference Shares	25,00,000
7% Debentures	25,00,000

Company earns a return of 12% and the tax on income is 50%.

Company wants to raise Rs.25,00,000 for its expansion project for which it is considering following alternatives :

- a) Issue of 20,000 Equity Shares at a premium of Rs.25 per share.



b) Issue of 10% Preference Shares.

c) Issue of 8% Debentures.

Projected that the Price Earning ratios in the case of Equity, Preference and Debenture financing Rs.20, 17 and 16 respectively.

Which alternative would you consider to be the best. Give reasons for your choice.



### Question 3

A Company earns a profit of Rs.3,00,000 per annum after meeting its Interest liability of Rs.1,20,000 on 12% debentures. The Tax rate is 50%. The number of Equity Shares of Rs.10 each are 80,000 and the retained earnings amount to Rs.12,00,000. The company proposes to take up an expansion scheme for which a sum of Rs.4,00,000 is required. It is anticipated that after expansion, the company will be able to achieve the same return on investment as at present. The funds required for expansion can be raised either through debt at the rate of 12% or by issuing Equity Shares at par.

Required :

- (i) Compute the Earnings Per Share (EPS), if:
  - (a) the additional funds were raised as debt
  - (b) the additional funds were raised by issue of equity shares.
- (ii) Advise the company as to which source of finance is preferable.



### Question 4 – Radon Ltd.

Radon Ltd. provides you with following information

	Rs.
EBIT	6,50,000
Less : Interest (@ 12%)	<u>1,50,000</u>
EBT	5,00,000
Less Income Tax	<u>2,50,000</u>
EAT	2,50,000
No of Shares (FV 10)	1,00,000
PE Ratio	10

The company has undistributed reserves of Rs. 15,00,000. The company needs Rs. 50,00,000 for expansion. This amount will earn the same rate as funds already employed. You are informed that a debt equity ratio i.e debt / debt + Equity higher than 50% will push the P.E Ratio down to 8 and raise the interest rate on additional amount borrowed to 15%. You are required to ascertain the probable price of the share.

- (i) if the additional funds are raised as debt
- (ii) If the amount is raised by issuing equity shares.

## 4. INDIFFERENCE POINT :

Indifference point is the levels of EBIT where the EPS of various financing plan is the same. The firm shall be indifferent towards the selection of any financing plans. This point is also known as EPS equivalency point since this shows that, between the two given alternatives of financing (regardless of leverage in the financial plans) EPS would be the same at the given level of EBIT.

The equivalency or indifference point can also be calculated using the following equation

$$\frac{\text{EPS Plan A}}{(\text{EBIT} - \text{Interest}) (1 - t) - \text{Preference Dividend}} = \frac{\text{EPS Plan B}}{(\text{EBIT} - \text{Interest}) (1 - t) - \text{Preference Dividend}}$$

$$\frac{\text{No of Shares} - 1}{\text{No of Shares} - 2}$$

Where,

EBIT = Earnings before Interest and Tax (Indifference point)

T = Tax



### Question 5

Calculate the level of earnings before interest and tax (EBIT) at which the EPS indifference point between the following financing alternatives will occur.

(i) Equity share capital of Rs.6,00,000 and 12% debentures of Rs.4,00,000

Or

(ii) Equity share capital of 4,00,000, 14% preference share capital of Rs.2,00,000 and 12% debentures of Rs.4,00,000.

Assume the corporate tax rate is 35% and par value of equity share is Rs.10 in each case.



### Question 6 – Web Publishing

Web Publishing is considering a capital structure of Rs. 50,00,000 for which various mutually exclusive set options are available. Calculate the indifference point of EBIT between the following alternative sets:

i) Equity share capital of Rs. 50,00,000 Vs 12% Debt of Rs. 25,00,000 + Equity share capital of Rs. 25,00,000.

ii) Equity share capital of Rs. 50,00,000 Vs 13% Preference Share Capital 25,00,000 + Equity share capital of Rs. 25,00,000.

iii) Equity share Rs. 30,00,000 + 15% Debentures Rs. 20,00,000 Vs Equity share capital of Rs. 20,00,000 + 13% Preference Share Capital Rs. 10,00,000. plus 15% Debenture Rs.20,00,000.

Assume tax rate 50%. Face value of equity shares Rs. 100.

## 5. FINANCIAL BREAK POINT :

It is the minimum level of EBIT needed to satisfy all fixed charges i.e. interest and preference dividends. It is the level of EBIT for which the firms EPS just equals ZERO. It means that if the firms earns below the Financial Break Point, the EPS of the firm shall be negative. If EBIT is more than financial breakeven point, then more fixed cost financing instruments can be used. It also means that the EPS of the firm shall be positive.



### Question 7

Compute the Financial B-E-P in the following cases :

i) Interest cost Rs. 20,000

ii) Interest cost Rs. 20,000, Preference Dividend Rs.20,000 Tax @50%.

iii) Interest cost Rs. 30,000, Preference Dividend Rs.20,000. Income Tax is @40%. Dividend tax is 10%.



**Question 8 – Z Company Ltd.**

The management of Z Company Ltd. wants to raise its funds from market to meet out the financial demands of its long-term projects. The company has various combinations of proposals to raise its funds. You are given the following proposals of the company:

(i)

Proposals	% of Equity	% of Debts	% of Preference shares
P	100	–	–
Q	50	50	–
R	50	–	50

(ii) Cost of debt – 10%

Cost of preference shares – 10%

(iii) Tax rate – 50%

(iv) Equity shares of the face value of Rs.10 each will be issued at a premium of Rs.10 per share.

(v) Total investment to be raised Rs.40,00,000.

(vi) Expected earnings before interest and tax Rs.18,00,000.

From the above proposals the management wants to take advice from you for appropriate plan after computing the following:

- Earnings per share
- Financial break-even-point
- Compute the EBIT range among the plans for indifference. Also indicate if any of the plans dominate.



**Question 9 – Clean Air Ltd.**

Clean Air Ltd. plans to expand assets by 50%. To finance the expansion, it is choosing between a straight 12% debt issue and ordinary shares. Its balance sheet and profit & loss a/c. are shown below

**Clean Air Ltd. Balance Sheet as on 31<sup>st</sup> Dec. 2012**

Liabilities	Rs.	Assets	Rs.
11% Debentures	40,00,000	Total Assets	2,00,00,000
Ordinary Share Capital (10,00,000 shares of Rs. 10 each)	1,00,00,000		
Retained Earnings	60,00,000		
	<b>2,00,00,000</b>		<b>2,00,00,000</b>

**Profit & Loss A/c. for the year ended 31<sup>st</sup> Dec. 2012**

	Rs.
Sales	6,00,00,000
Total Costs (excluding interest)	<u>5,40,00,000</u>
Net Income before taxed EBIT	60,00,000
Interest on debentures @ 11 %	<u>4,40,000</u>
Income before taxes	55,60,000

Taxes @ 50%	<u>27,80,000</u>
Profit after tax	27,80,000
Earnings per share of Rs. 27,80,000 /10,00,000	Rs. 2.78
Price / earnings ratio	7.5 times
Market price	Rs. 20.85

If ABC Corporation finance Rs. 1 crore expansion with debt, the rate of the incremental debt will be 12% and the price/earnings ratio of the ordinary shares will be 5 times. If the expansion is financed by equity, the new shares can be sold at Rs.12.50 per share and the price/earnings ratio will remain at 7.5 times.

- Assuming that new income before interest and taxes (EBIT) is 10% of sales, calculate earnings per share at sales levels of Rs.4 crores, Rs.8 crores and Rs.10 crores, when financing is with (i) ordinary shares & (ii) debt.
- At what level of earnings before interest and taxes (EBIT), after the new capital is acquired, would earnings per share (EPS) be the same whether new funds are raised by issuing ordinary shares or raising debt?
- Also determine the level of EBIT at which uncommitted earnings per share (UEPS) would be same if sinking fund obligations amount to Rs. 5 lakhs per year.
- Using the P/e ratio, calculate the market value per share for each sales level for both the debt and the equity financing.

Thanks ....



## CHP - 8

# Capital Structure Theories



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### CONCEPTS COVERED

1. INTRODUCTION
2. OPTIMUM CAPITAL STRUCTURE
3. CAPITAL STRUCTURE THEORIES
4. NET INCOME APPROACH
5. NET OPERATING INCOME APPROACH
6. TRADITIONAL APPROACH
7. MODIGLIANI – MILLER APPROACH
8. MODIGLIANI – MILLER THEORY ARBITRAGE
9. MODIGLIANI – MILLER THEORY CORPORATE TAXATION
10. MODIGLIANI AND MILLER THEORY CRITISIMS
11. PECKING ORDER THEORY
12. PRACTICAL QUESTIONS



## 1. INTRODUCTION :

A lot of research and brains have been put in designing capital structure. We did study chapter on “capital structure”, where we concluded that firm should select the capital structure which would maximise the shareholders wealth. We also studied that chapter on “Cost of Capital”, where we studied how to calculate cost of various source of finance. The basic idea is to create “Optimum Capital Structure”.

## 2. OPTIMUM CAPITAL STRUCTURE :

Capital Structure is said to be optimum when the firm has a combination of debt – equity mix which has the lowest WACC and which maximises the wealth of the firm.

Optimum Capital Structure = Lowest WACC and Maximum Market Value of the Firm.

Optimum Capital Structure strikes the perfect balance between the risk and returns. Now we must also note that there is no one optimum capital structure. It varies from one firm to another firm and from one industry to another. You might even find similarity in capital structure of two firms belonging to the same industry. A lot also depends on the market conditions and reputation of the management. Whatever may be the case, the finance manager must strive to achieve optimum capital structure of the firm.

## 3. CAPITAL STRUCTURE THEORIES :

There are various theories floated on capital structure. Those are

1. Net Income Approach
2. Net Operating Income Approach
3. Traditional Approach
4. MM Approach
5. Pecking Order Approach

Before we start learning them, there are certain assumptions, to be kept in mind to set the premises for the application of these theories.

Assumptions

1. The capital structure of the company consists of debt and equity capital only.
2. All the earnings of the company are distributed as dividends to the shareholders, i.e there is no retention.
3. There are no taxes, no corporate, personal or income tax.
4. The firm has perpetual life.
5. The capital employed of the firm is assumed to remain constant. However the debt equity mix can be changed. This can be done by
  - a. Raising debt and repaying equity
  - b. Raising equity and repaying the debt.

## 4. NET INCOME APPROACH :

Net income approach is suggested by Durant David.

**Assumptions :**

1. The capital structure of the company consists of debt and equity capital only.
2. All the earnings of the company are distributed as dividends to the shareholders, i.e there is no retention.

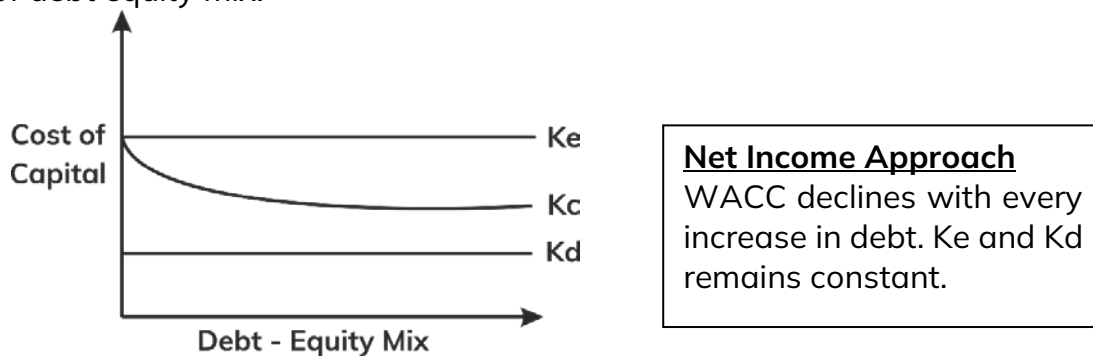
3. There are no taxes, no corporate, personal or income tax.
4. The firm has perpetual life.
5. The capital Employed of the firm is assumed to remain constant.
6. Kd (Cost of Debt) will always be less than Ke (Cost of Equity).
7. **Kd and Ke shall remain constant at all levels of debt – equity mix.**

**Theory :**

As per this approach as more and debt is introduced into the capital structure, debt being the cheaper option, the WACC of the company will keep on falling. Higher debt will increase the financial leverage, which results into decline in overall weighted average cost of capital. This will increase the value of both firm and equity shares.

Optimum capital structure according to this approach is 100% debt structure.

The underlying assumption of this approach is that kd and ke shall remain unchanged at any level of debt equity mix.



**Application :**

The application of this approach involves the following steps.

1.	Determine EBIT, interest and earnings before tax.
2.	$\begin{array}{r} \text{EBIT} \quad \quad \quad \text{xx} \\ - \text{Interest} \quad \quad \quad \underline{\text{xx}} \\ \text{Dividend} \quad \quad \quad \text{xx} \end{array}$
3.	$\text{Cost of equity (ke)} = \frac{\text{Dividend}}{\text{MPe}} \quad \text{OR} \quad \text{MPe} = \frac{\text{Dividend}}{\text{ke}}$ <p>MPe = Market value of equity</p>
4.	$\text{Cost of debt (kd)} = \frac{\text{Interest}}{\text{mpd}} \quad \text{OR} \quad \text{MPd} = \frac{\text{Interest}}{\text{kd}}$ <p>MPd = Market value of debt</p>
5.	$V = E + D$ <p>V = Value of firm E = Value of equity D = Value of debt</p>
6.	$\text{Overall cost of capital} = \frac{\text{EBIT}}{V}$ <p>V = Value of firm</p>



**Question 1 – Harry Ltd.**

Harry Ltd. is expecting an annual earning before the payment of interest and tax of Rs.4 lacs. The company structure has 16 lacs in 10% debentures. The cost of equity or capitalization rate is 12.5%. You are required to calculate the value of firm according to NI approach. Also calculate overall cost of capital.



**Question 2**

Assume in the ILL 1 above that the firm raises further 4 lakhs by issue of debentures and the proceeds there of are applied to buy back equity. You are required to calculate the value of firm and overall cost of capital, also evaluate the application of Net Income Approach in the same?

**5. NET OPERATING INCOME APPROACH :**

This was another theory suggested by Durant David to capital structure.

**Assumptions :**

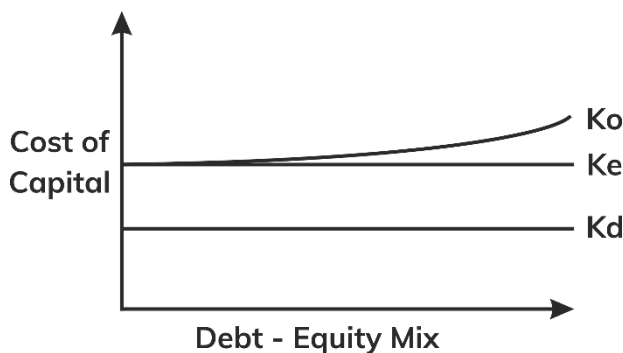
1. The capital structure of the company consists of debt and equity capital only.
2. All the earnings of the company are distributed as dividends to the shareholders, i.e there is no retention.
3. There are no taxes, no corporate, personal or income tax.
4. The firm has perpetual life.
5. The capital Employed of the firm is assumed to remain constant.
6.  $K_d$  (Cost of Debt) will always be less than  $K_e$  (Cost of Equity).
7.  **$K_d$  shall remain constant at all levels of debt – equity mix.**

**Theory :**

According to this approach, the WACC and capital structure decisions are independent of each other i.e. WACC remains constant at all levels of debt-equity mix. This happen because as more and more debt is introduced in the capital structure,  $k_d$  being the same,  $k_e$  rises in such a way that it off sets the benefits of cheaper debt thereby having wall unchanged.

According to this approach, there is no specific optimum capital structure. Every capital structure is optimum because wall is unaffected by capital structure.

The underlying assumption of this approach is  $k_d$  remains constant at all levels of debit equity mix.



Net Operating Income Approach  
WACC ( $K_o$ ) remains constant because rise in  $K_e$  offsets the benefits of cheaper debt.  $K_d$  remains constant at all levels of debt – Equity mix.



**Application :**

The application of this approach involves the following steps.

1.	Determine EBIT, interest and earnings before tax.									
	<table border="0"> <tr> <td style="padding-right: 20px;">EBIT</td> <td style="padding-right: 20px;"></td> <td style="padding-right: 20px;">xx</td> </tr> <tr> <td>- Interest</td> <td style="padding-right: 20px;">xx</td> <td></td> </tr> <tr> <td>Dividend</td> <td style="padding-right: 20px;">xx</td> <td></td> </tr> </table>	EBIT		xx	- Interest	xx		Dividend	xx	
EBIT		xx								
- Interest	xx									
Dividend	xx									
2.	Compute market value of firm = $\frac{EBIT}{k_o}$									
3.	Compute market value of debt = $\frac{Intrest}{k_d}$									
4.	Compute market value of equity = $V - D$									
5.	Compute cost of equity capital = $\frac{EBIT}{Value\ of\ equity}$									



**Question 3 – Cool Season Ltd**

Cool Season Ltd is expected annual net operating income is Rs.2,40,000. The company has 10% debt of Rs.7,20,000. The overall capital is also rate is 15%. Decide total market value of the company and equity capitalisation rate. Also calculate the WACC.



**Question 4 – Traditional Ltd**

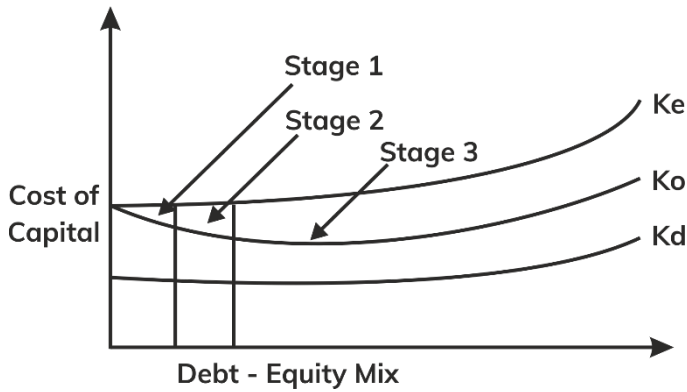
Traditional Ltd is expecting an earning. Before interest and tax Rs.4,00,000 and belong to risk class of 10%. You are required to find out the value of firm and cost of equity capital. If it employs 8% debit to the extent of 20%, 35% or 50% of the total financial requirement of Rs.20,00,000.

**6. TRADITIONAL APPROACH :**

As per this approach as more and more debt is introduced in capital structure, WACC initially falls and then rises. This is because as more and debt is introduced both the ke and kd starts rising due to increased risk perception of both the shareholders and lenders thereby causing WACC to rise also.

The ko will pass from three phases. 1<sup>st</sup> when ko is falling , 2<sup>nd</sup> when ko is constant and 3<sup>rd</sup> when ko is rising.

The firm should strive to reach the optimum capital structure and maximize its total value through a judicious use to both debt and equity in the capital structure.



**Traditional Approach**  
 Ko first Falls and then rises. Ke and Kd also rises with every additional debt in the capital structure. Firm should strive and achieve the optimum capital structure.



**Question 5**

Calculate WACC from the following data relating to Z companies.

	X Ltd.	Y Ltd.
Earning before interest and tax	2,40,000	2,40,000
10% debenture	4,00,000	–
Equity capitalisation rate	15%	20%



**Question 6 – Shiva Ltd.**

Shiva Ltd. is expecting an EBIT of Rs.3,00,000. The company presently raised its entire funds requirement of 20 lakhs by issue of equity at a capitalisation rate of 16%. The firm is now contemplating to redeem a part of capital by introducing debt financing. The firm has two options to raise debt to the extent of 30% or 50% of total funds. It is expected that for debt financing upto 30% the rate of interest will be 10% and equity capitalization rate is expected to increase to 17%. However if he firm upto for 50% debts, then interest rate will be 14% and equity capitalization rate will be 22%. You are required to compute value of firm and its overall cost of capital under different options.

Draw the conclusion with reference to traditional approach traditional approach.

**A glance at the Net Income Approach, Net Operating Approach and Traditional Approach**

Theories	Net Income Approach	Net Operating Income Approach	Traditional Approach
Cost of Equity (Ke)	Constant	Rises in such a way to offset the benefit of cheaper debt	Rises
Cost of Debt (Kd)	Constant	Constant	Rises
Cost of Capital (Ko)	Decreases	Constant	First Falls and then rises
Optimum Capital Structure	100 % Debt	No optimum capital structure	Firm should strive to achieve proper balance between debt and equity to achieve optimum capital structure. Optimum

Capital structure = Debt – Equity mix at lowest  $K_o$

### 7. MODIGLIANI – MILLAER APPROACH :

Thus approach is refinement of the net operating income approach. Even this approach believes that capital structure and wall are independent to each other. Some additional proposition are

1.  $k_d$  and  $k_e$  :  $k_d$  is always less than  $k_e$ . Cost of debt is always less than cost of equity. Cost of debt remains constant at all levels of debt equity mix. However the cost of equity rises due to increase in risk perception.
2. The capital markets are perfect. Investors are free to buy and sell securities.
3. Investors are well informed about risk and return in all types of securities.
4. There are no transaction cost.
5. Investors can borrow on the same terms as the firms do.
6. Investors expect different returns for different risk categories. At higher risk they expect a higher return.

The basic underlying is same as of operating net income approach i.e.  $k_d$  remains constant at all levels and risk in  $k_e$  off sets cheaper debt thereby maintaining WACC.

Since WACC is constant at all levels, every debt equity mix is as good as any other mix. There is no optimum capital structure.



#### Question 7

From the following data, find out the value of each firm its  $k_d$  and  $k_e$  as per Modigliani – miller approach.

	Firm A	Firm B	Firm C
EBIT	13,00,000	13,00,000	13,00,000
8% debentures	–	9,00,000	18,00,000

Every firm expects 12% return on investments.

### 8. MODIGLIANI – MILLAER THEORY ARBITRAGE :

Arbitrage is a process whereby the market value of two comes become identical. According to this theory the investor who originally owns a part of the levered firm will be better off selling his holdings in levered firm and buying holding in unlevered firm using his borrowing. Let me explain this with the following example :

**Example :** Firm A and B Ltd are similar in operation but have different capital structure.

- 1) A is financed Rs.10% 30 lakh debt and equity.
- 2) B is an all equity firm.

Both the firms have EBIT of 10 lakh and cost of equity is 20%.

	A	B
1) EBIT	10,00,000	10,00,000
– Interest	<u>3,00,000</u>	<u>–</u>
Dividend	7,00,000	10,00,000

2)	$E = \frac{d}{k_e}$	=	$\frac{7,00,000}{0.2}$	$\frac{10,00,000}{0.2}$
		=	35,00,000	50,00,000
3)	D	=	30,00,000	–
4)	$V = E + D$	=	65,00,000	50,00,000
5)	$k_o = \frac{EBIT}{V}$	=	$\frac{10,00,000}{65,00,000}$	$\frac{10,00,000}{50,00,000}$
		=	15.38%	20%

Now let say Mr.X holds 20%. Equity capital in A Ltd. and now wants to B Ltd. i.e. from levered firm to unlevered firm.

In order to maintain same level of risk he should exactly 20% stake in B Ltd. i.e. 50 lakh x 20% = 10 lakh and should borrow to the extent of 30 lakh x 20% = 6,00,000 @ 10%.

**Income Position**

From A

$$35,00,000 \times 20\% \times 20\% = 1,40,000$$

From B

$$50,00,000 \times 20\% \times 20\% = 2,00,000$$

$$\begin{aligned} &\text{– Interest (6,00,000 x 10\%)} && \underline{60,000} \\ & && 1,40,000 \end{aligned}$$

**Cash Flows**

1)	Sale of share in A Ltd	7,00,000
	Add : Borrowings	6,00,000
	Less : Purchase of shares in B Ltd.	<u>10,00,000</u>
	Surplus	<u>3,00,000</u>

Thus moving from A to B X will end up with a surplus of 3,00,000 which can be invested elsewhere to increase the return at same level of risk.

Thus Mr.X will be better off by moving from Co. A to Co. B.

Now one of the assumption of this model is that investors are well informed and they will start moving from firm A to firm B. This will increase the buying pressure on firm B and increase the selling pressure on the share of A Ltd.

The selling pressure will lead to market value of share of A Ltd. to fall there by causing its WACC to rise. On the other hand the increased buying pressure on share of B Ltd. will increase the market value there by reducing the wall of B Ltd.

So at one point value of both firm A and B will be equal inspite of different capital structure. Hence value and capital structure. Hence value and capital structure are independent of each other.

### Effects of arbitrage process

- 1) The price of equity shares of overvalued firm decreases due to selling pressure on those shares.
- 2) The price of equity shares of undervalued firm increases due to buying pressure on those shares.
- 3) The process ends when the market value of two firm becomes identical.

To sum up the arbitrage process, it implies that with SAME RISK, the firm should have same MARKET VALUE i.e. SAME  $K_c$ .

SAME RISK = SAME  $K_c$  = SAME MARKET VALUE



### Question 8 – Sita Ltd.

Following information is available from the books of Sita Ltd. and Rita Ltd.

	<b>Sita Ltd.</b>	<b>Rita Ltd.</b>
Net operating Income	2,40,000	2,40,000
10% Debenture	7,20,000	–
Equity capitalization rate	16%	16%

Calculate the total value and WACC.



### Question 9 – Sita Ltd.

Assuming that an investor holds 20% equity in Sita Ltd. will be benefited by investing in Rita Ltd.

## 9. MODIGLIANI – MILLAER THEORY CORPORATE TAXATION :

According to this theory, when taxes are paid on corporate Income, use of debt funds is advantageous due to the tax saving effect on the interest payment. Equity dividends and Retained Earnings are not “deductible” as they are appropriations and not the charge against the profit of the company.

Effect of Tax Saving - When corporate Taxation is included in the analysis

1. The value of Firm will increase and
2. The cost of Capital Decreases

WACC of a company that has debt component in the capital structure will be calculated as follows

$$K_o = (K_e \times \% \text{ of Equity}) + (1-t) (K_d \times \% \text{ of Debt})$$



### Question 10 – Vrunda Limited

Vrunda Limited paid the dividend of Rs. 500,000 with cost of equity @ 25%. It employees Rs. 60,00,000 debt bearing an interest rate of 15%. Compute the overall value of the firm and its WACC.

Assume the Tax rate 50% and prove that corporate taxation reduces and WACC and increases the overall value of the firm.

## 10. MODIGLIANI AND MILLER THEORY CRITISMS :

Modigliani and Miller theory is not free of criticism. It is criticised on the following grounds

1. The theory assumes no transaction cost. It is baseless. All capital markets all over the world have transactions cost for buying and selling securities.
2. Also the theory assumes perfect capital market. In reality there exist various imperfections.
3. The theory also explained arbitrage, which nullifies the effect of leverage, which is not true. Investors never behave in such a calculated and rational way in switching from leveraged to unleveraged firm and vice – versa.
4. The theory also assumes perfect knowledge on the part of investors. In reality majority of investors have no knowledge with relation to the operation of the company. They buy and sell the shares not only on the basis of fundamental of the company, but also variety of reasons.

## 11. PECKING ORDER THEORY :

This theory was proposed by Donaldson in 1961. It was further developed by Myer in 1984. According to this theory the capital structure of the company is more dependent on internal cash flows, cash dividend and acceptable investment opportunities. This theory gives lot of importance to the cost involved in raising the funds.

### Assumptions of this theory

1. There is no cost involved on the funds that are internally generated.
2. It involves cost for raising the external funds.
3. Cost of raising debt is cheaper than the cost of raising equity.
4. Servicing debt is cheaper than the servicing equity

### Donaldson's Approach

1. Donaldson suggests that the firm should use low-cost funds in order to minimize WACC and maximise the Value of the firm.
2. The low cost funds means internally generated funds.
3. To minimise the overall cost of funds, the order of raising funds should be
  - a. Internal Cash Accruals
  - b. Additional Debts
  - c. Additional Equity

This order is evolved according to the cost involved for raising the funds. As per the assumptions stated the cost of raising internal cash is least and that of raising the equity is the highest.

4. Therefore as per Donaldson the firm should rely on internally generated funds, as much as possible. However if the firms needs additional funds then the order should be debt and then finally the equity.

### MYERS Approach

1. Myers suggests that the firms follow “Modified Pecking order” in their approach of financing.
2. He suggested that the order of preference is attributed to asymmetric information relating to the capital markets. Due to asymmetry of information the projects may be

under-valued by the markets. The issue of equity shares is interpreted in the market, as bad news.

3. Hence, the finance manager prefers to finance the projects by internal financing. If the internal funds are insufficient, the project may be financed by debt and finally if required through equity.
4. Myers argued that a levered firm takes a sub optimal investment decisions because of the burden of fixed interest. Optimum capital structure is obtained at a point where the expected value of tax shield on additional debt is equal to the expected value of investment opportunity given up.

### **ASPECTS of pecking order theory**

1. Low dividend payout Ratio, because internal funds are used for expansion. i.e Sticky dividend policy
2. Preference for using internally generated funds.
3. Aversion of Equity Shares, it should be the last resort to financing.

## **12. PRACTICAL QUESTIONS :**



### **Question 11 – Lords Ltd's**

Lords Ltd's EBIT is Rs.4,00,000. The company has 10%, 20 lakh debentures. The equity capitalization rate i.e.  $K_e$  is 16%.

You are required to calculate:

- (i) Market value of equity and value of firm
- (ii) Overall cost of capital.
- (iii) The company raises Rs. 5,00,000 of debt to uses the funds to repay the equity. How will Net Income Approach work?



### **Question 12 – Sushila Ltd's**

Sushila Ltd's operating income is Rs.4,00,000. The firm's cost of debt is 10% and currently the firm employs Rs.20,00,000 of debt. The overall cost of capital of the firm is 16%.

You are required to determine:

- (i) Total value of the firm.
- (ii) Cost of equity.
- (iii) The company raises Rs. 2,00,000 of debt to uses the funds to repay the equity. How will Net Operating Income Approach work?



### **Question 13 – Nutomode Ltd.**

Nutomode Ltd. has a EBIT of Rs.6 lakhs. Presently the company is entirely financed by Equity Capital of Rs.50 lakhs with Equity Capitalization Rate of 15%. It is contemplating to redeem a part of its capital by introducing Debt Financing. It has two options – to raise debt to the tune of 30% or 50% of the total funds.

It is expected that for debt financing upto 30% will cost 10%, and Equity capitalization Rate will rise to 17%. However, if the Firm opts for 50% Debt, it will cost 14% and Equity Shareholders expectation will be 22%.

From the above, compute the Overall Cost of Capital of different options and comment thereon with reference to the application of Traditional Approach.



**Question 14 – Riya and Siya**

There are two firms Riya and Siya, having same earnings before interest and taxes i.e. EBIT of Rs.40,000. Firm Siya is levered company having a debt of Rs.2,00,000 @ 8% rate of interest. The cost of equity of Riya company is 10% and of Siya company is 11.50%.

Find out how arbitrage process will be carried on?



**Question 15 – Lilly Ltd.**

Lilly Ltd. is presently financed entirely by Equity Shares. The current market value is Rs.5,00,000. A dividend of Rs.1,00,000 has just been paid. This level of dividend is expected to be paid indefinitely. The company is thinking of investing in a new project involving an outlay of Rs.6,00,000 now and is expected to generate net cash receipts of ₹ 1,40,000 per annum indefinitely. The project would be financed by issuing Rs.6,00,000 debentures at 15% interest rate. Ignoring tax consideration –

1. Calculate the value of equity shares and the gain made by shareholders, if the cost of equity rises to 25 %.
2. Prove that the weighed average cost of capital is not affected by gearing.

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Thanks ....





## CHP - 9

# Capital Budgeting



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### CONCEPTS COVERED

1. INTRODUCTION
2. CAPITAL BUDGETING
3. FEATURES AND SIGNIFICANCE
4. CAPITAL INVESTMENT PROCESS
5. TECHNIQUE FOR EVALUATION PROCESS
6. CASH FLOWS
7. TECHNIQUE FOR EVALUATION PROCESS
  - (A) PAYBACK PERIOD
  - (B) ACCOUNTING RATE OF RETURN (ARR)
  - (C) DISCOUNTING TECHNIQUE
  - (D) DISCOUNTED PAYBACK
  - (E) NET PRESENT VALUE (NPV)
  - (F) PROFITABILITY INDEX (PI)
  - (G) INTERNAL RATE OF RETURN (IRR)

CONCEPTS COVERED

8. PRACTICAL QUESTIONS
9. EQUIVALENT NPV
10. NPV V/S IRR
11. REPLACEMENT DECISIONS
12. CAPITAL RATIONING
13. MIRR
14. PROBLEM FOR SELF PRACTICE



## 1. INTRODUCTION :

Now we are entering into altogether new section on Finance --- Investing Decisions---

In the first chapter we have learned that the objectives of financial management include financing and investing of funds. We did learn various aspects on financing decision so now lets, with funds in hands, learn some aspects of investing funds.

The investments decisions are popularly known as “Capital Budgeting Decisions”. It involves taking decision in investing funds, of course, keeping in mind cost of raising funds.

## 2. CAPITAL BUEGETING :

Capital Budgeting Decisions are related to allocation of investible funds to different long term assets. Such investments are generally huge in amount and long term in nature. There is no hard and fast rule to define the term long term, however period exceeding one year – falls in these categories. Capital Budgeting involves the entire process of decision making relating to acquisition of long term assets and its use and return on such assets. The success of capital budgeting lies in forecasting. The knowledge of capital budgeting does not only help the manufacturing firm, but also helps other types of organizations.

Capital budgeting decisions may include decisions on buying land, building plant and machinery, undertake research activity regarding development of new product, diversify into new product line. Such decision may directly or indirectly affect the profitability of the firm for years to come. Some decision like product introduction, expansion of production facility etc. will directly increase the profits, whereas decisions like research and development may also help to decrease the cost.

Finance manager has a major role to play in capital budgeting. The success of capital budgeting lies in in-depth analysis, evaluation of alternative proposals, selection of correct alternative and then forecasting the future cash flows. Capital budgeting is not free of criticism, the major drawback is that the capital budgeting decisions are taken on the basis future forecasting, and future is uncertain. However due to uncertainty, we can't stop planning, while joining college, I can't predict as what the result shall be, but that does not stop me from joining school.

## 3. FEATURES AND SIGNIFICANCE :

Capital budgeting is said to play vital role in corporate Financial Management. The relevance and significance may be stated as follows.

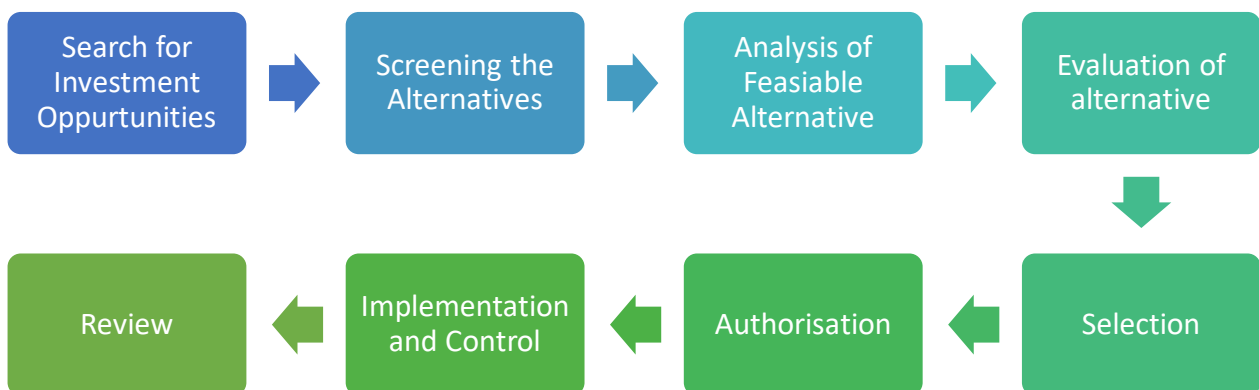
- 1. Long Term Decisions :** The most important feature of capital budgeting decisions, which makes capital budgeting important for any corporate is that these decisions have long term impact on the bottom-line of the company i.e it affects the profitability and the return to the shareholders. Such decisions generally change the position of the firm. For eg. Introduction of i-phone by apple, changed the entire fortunes of the company. Reliance entering in the field of Gas and Power was strategic choice.
- 2. Huge Investments :** Another feature of capital budgeting is that it generally requires large commitments of funds. Such decisions will lead to blocking of huge funds for long

term, hence finance manager should give considerable thought to such decisions. Finance manager should ensure that return from the projects are enough to cover the cost of raising funds to finance such decisions.

3. **Irreversible Decisions** : Capital budgeting decisions, are long term calls and hence generally irreversible in nature. Its like a carrier path, once taken there is no looking back, because of reversed than it can lead to disturbance for long period. Incase if such decisions are to reversed then the company should be prepared to absorb huge losses and start from the bottom. Finance managers should inspect every minute detail before putting to such calls.
4. **Competition and perception** : Capital Budgeting decisions ensure that firm remains competitive in market and absorbs the changes that market faces. Such decision may also be taken to change the perception of the people with reference to the company. For eg : Samsung's decision to enter into low cost mobile handset, have enabled it remain market leader for a long time. Its only now that they are facing competition from market.

#### 4. CAPITAL INVESTMENT PROCESS :

Capital Budgeting Decisions generally follow the following procedure.



1. **Search for Investment Opportunities:**  
Perhaps, it's the first stage, but is very crucial stage. Investor should always keep its eyes on the opportunities available in the market. Management should have an eye for innovation and development. Changes at times are not welcome and resisted, but management should have long term vision in mind. Firms world over have various objectives, however every firm would agree to the two most common objectives i.e survival and profitability. Ideas coming across the investor, should be stand the chance of survival and profitability. The investor should always create pool of available opportunities to screen them and select the best one.
2. **Screening of available opportunities :**  
Each opportunity should then be made to pass through preliminary screening process in order to throw out unwanted projects, which are just ideas and cannot be implemented. Its like cutting weeds from the field to allow regular crops to grow. To conduct such preliminary checks, firms should lay down certain accepted criteria for

taking it ahead. If the opportunity passes through these stage, then they can be taken ahead for further analysis and testing. It will no good to waste time and money on projects which cannot stand the test of survival and profitability.

**3. Analysis of Feasible Alternatives :**

Once the opportunities are screened, the selected one is now put to detailed analysis. All technical and commercial details are gathered and evaluated. Such projects can be related to introduction of new products, improvement in existing once or expansion of current project. The project should be evaluated on risk and return front.

**4. Evaluation of Alternatives :**

This is the final stage before the decision is implemented. The alternatives should be evaluated in terms of investments, inflows and outflows. It should be matched with the firms objectives, availability of the funds with the firm, the time gestation etc.

**5. Selection :**

Once the alternatives are evaluated, the next stage is to select the alternative, which stands the test of risk, return, duration, funds, and other factors.

**6. Authorization :**

Once the proposal is selected, the next step to send it for finals approvals and get the funds released from the appropriate authority. This step also involves, authorizing appropriate person to carry out the task on this projects, and setting teams and reporting structure.

**7. Implementation :**

Once the project is authorized the next stage is implementation. Its putting machinery into motion, gathering the manpower needed, purchasing the machinery and land needed and set the ball rolling.

**8. Control :**

When the project in running mode, control becomes essential. Control is very essential to ensure project stays on path and does not deviate from its goals. It may require constant fuel to run, otherwise the car can stop in middle and that can be troublesome.

**9. Reviews :**

The progress of the project has to be effectively monitored and contact feedback reviews are to be generated. The reports on production, sales, capital expenditure, progress reports, comparing performance with actual plans set, completion audits will help the enterprise to achieve its objectives.

**5. TECHNIQUE FOR EVALUATION OF PROPOSALS :**

There are different techniques available to evaluate different alternative proposals. Each of these techniques has its own specific methodology and acceptance criterion.

These techniques can be grouped into two categories as presented below.

## Capital Budgeting Techniques

### Traditional and Non discounting

- \* Payback period
- \* Account Rate of Return (ARR)

### Discounted Cash Flows / Time Adjusted

- \* Discounted Pay Back
- \* Net Present Value
- \* Profitability Index
- \* Internal rate of return (IRR)
- \* MIRR

## 6. CASH FLOWS :

One of the most important task in capital budgeting decisions is estimating cash flows. The decision is based how accurately one can estimate cash flows.

The project cash flows can be classified as inflows and outflows.

### Inflows

- \* Recurring inflows
- \* Recovery of working capital
- \* Terminal rate of asset

### Outflow

- \* Initial outflow (Project / Asset Cost)
- \* Working capital

### 1) Initial cash outflow

The project would need initial investment in form of asset to be purchased. It should be calculated in the following manner.

#### Incase of new project / Asset

Cost of Asset	xx
+ Installation / Setup cost	<u>xx</u>
	xx

#### In case of replacement decision

Cost of Asset	xx	+ Tax on loss as
+ Installation Cost	<u>xx</u>	it leads to tax
– Sale of old Asset	xx	Savings
+/- Tax effect on		– Tax on profit as
Profit or Loss on sale		it leads to extra
of old Asset	<u>xx</u>	outflow of cash
	xx	

**2) Outflow of working capital**

The project also needs working capital for its functioning. The working capital may be needed in first year or may be needed in future years. If needed in future years, then it should be discounted to relevant years.

**3) Recurring inflows**

Recurring inflows mean the projected inflows that the project is expected to generate as a difference between operating revenue and operating expenses. It is calculated as follows :

Operating revenue	xx
– Operating expenses	<u>xx</u>
NPBDT	xx
– Depreciation	<u>xx</u>
NPBT	xx
– Taxation	<u>xx</u>
NPAT	xx
+ Depreciation	<u>xx</u>
Cash flows	xx

**Explanation**

We need cash flows, now cash flow means profit after tax but before depreciation. Before depreciation - because depreciation is a non cash expense. However, depreciation is first to be deducted to arrive at NPBT because tax is to be charged on NPBT, later depreciation should be added back to NPAT reach to cash flows.

**4) Recovery of working capital**

Once the project is done even the working capital will be free and recovered at the end of its life. Now, if we are using discounting technique then the inflow should be discounted to relevant year.

**5) Terminal value of asset**

The asset can be sold for scrap value at the end of economic life. However, we should consider tax effect on the scrap value. It should be calculated in the following manner.

Scrap value	xx	+ Tax on loss
+/- Tax effect on		– Tax on profit
Profit / Loss on scrap value	<u>xx</u>	
	xx	



**Question 1 – Pooja Ltd.**

Pooja Ltd wishes to buy a machine of Rs.80,00,000. It is expected that company will have expected net profit before dep. and tax for Rs.24,00,000. The machine will run for 5 years. Calculate cash flow. Assume tax @50%.

## 7. TECHNIQUE FOR EVALUATION OF PROPOSALS :

### NON DISCOUNTING TECHNIQUES :

#### (a) Payback Period :

Payback period refers to the period taken by the project to recover its initial expenditure. It is usually expressed in terms of years, like an X project will take 3 years to recover out initial investment. This concept is used in initial screening of projects. While comparing two or more projects, generally projects with lower payback are selected.

In simple terms it can be defined as the number of years required to recover the cost of the investment.

Payback Method has its own merits and demerits.

#### Merits :

- 1) It is very simple to understand and calculate. It does not need any specific skills or involves any formulae for calculation.
- 2) It is very useful for initial screening, when the firm is looking at multiple projects, this technique will allow us to weed out unwanted projects based on the objectives of the firm.
- 3) This method gives an indication to the prospective investors specifying when their funds are likely to be repaid.
- 4) It does not involve assumptions about future interest rates.
- 5) Ranking the projects according to their ability to repay quickly may be very useful to the firm who are short on liquidity.

#### Demerits :

- 1) It cannot be treated as project acceptance technique, means it cannot tell us whether the project should be accepted or rejected.
- 2) It methods ignores the cash generated after the payback period, some project can give low cash flows in initial years followed by huge cash flows later, such project can have great profitability but higher payback period.
- 3) This concept ignores, the cost of capital. Capital needed to invest in project does not come free.
- 4) Payback period also does not consider the salvage value that is recoverable at the end of the project.
- 5) Longer pay back does not mean that the project is bad. It may involve project with long gestation. There are industries which involves investment for long periods, but are essential to the economy. However, they may not yield their highest returns for a number of years and the result is that the payback method is biased against the very investment that are most important to long-term.



$$\text{Payback Period} = \frac{\text{Total Initial Investment}}{\text{Average Expected Inflows}}$$

**Note :** While calculating cash inflow, depreciation is added back to profit after tax. It should be added because depreciation is a non cash expense – it does not result in outflow of cash.



**Question 2 – Pooja Ltd.**

Pooja Ltd wishes to buy a machine of Rs.40,00,000. It is expected that company will have expected net profit before dep. and tax for Rs.12,00,000. The machine will run for 5 years. Calculate cash flow and payback period and payback profitability. Assume tax @50%.



**Question 3 – Sarita Ltd.**

Sarita Ltd. Undertakes a project requiring cash outflow of Rs.80,00,000. Expected cash inflows for 5 years are as follows :

Years	Inflows
1	8,00,000
2	16,00,000
3	28,00,000
4	16,00,000
5	14,00,000

Calculate payback period and payback profitability.

**(b) Accounting rate of return :**

The Accounting rate of return (also known as return on investment or return on capital employed) method employ the normal accounting technique to measure the increase in profit expected to result from an investment by expressing the net accounting profit arising from the investment as a percentage of that capital investment. In this method, most often the following formula is applied to arrive at the accounting rate of return.

$$\text{Accounting Rate of Return} = \frac{\text{Average Annual Profit After Tax}}{\text{Average Investment}} \times 100$$

$$\text{Average Investment} = \frac{\text{Initial Invt} - \text{Salvage Value} + \text{Salvage Value} + \text{Working Capital}}{2}$$

Sometimes, initial investment is used in place of average investment. Of the various accounting rates of return on different alternative proposals, the one having highest rate of return is taken to be the best investment proposal. For example, in three alternative proposals A, B and C with expected accounting rates of return of 10%, 20% and 18% respectively. Projects will be selected in order of B, C and A. If the prevailing rates of interest is taken to be 15% p.a., only proposals B and C will qualify for consideration and in that order.

**Merits and Demerits :** The merits and demerits of accounting rate of return method are summarised as follows :

**Merits :**

- It is easy to calculate because it makes use of readily available accounting information.
- It is not concerned with cash flows but rather based upon profits which are reported in annual accounts and sent to shareholders.
- Unlike payback period method, this method does take into consideration all the years involved in the life of a project.
- Where a number of capital investment proposals are being considered, a quick decision can be taken by use of ranking the investment proposals.
- If high profits are required, this is certainly a way of achieving them.

**Demerits :**

- It does not take into account time value of money.
- It fails to measure properly the rates of return on a project even if the cash flows are even over the project life.
- It used the straight line method of depreciation. Once a change in method of depreciation takes place, the method will not be easy to use and will not work practically.
- This method fails to distinguish the size of investment required for individual projects. Competing investment proposals with the same accounting rate of return may require different amounts of investment.
- It is biased against short-term projects in the same way that payback is biased against long-term ones.
- Several concepts of investment are used for working out accounting rates of return. Thus there is no full agreement on the proper measure of the term investment. Thus different managers have different meaning when they refer to accounting rate of return.
- The accounting rates of return does not indicate whether an investment should be accepted or rejected, unless the rates of return is compared with the arbitrary management target. It measure the return in relation to the outlay and does not evaluate the absolute worth of the return. Problem can arise in defining yearly profits, which will depend, to a certain extent, on the accounting policies adopted by the term with respect to such items as stock valuation, treatment of depreciation, research and development etc.



**Question 4**

A project of 20 years life requires an original investment of Rs. 1,00,000. The other relevant information is given below :

Average annual earnings before depreciation and tax	Rs. 20,000
Annual Tax rate	50%

**Calculate :**

- (1) Pay back period
- (2) Pay back profitability
- (3) Average rate of Return

(4) Rate of Return on Original Investments



**Question 5**

A project needs an initial investment of Rs. 50,000. Tax rate is 55%. The Company follows straight line depreciation and the proposed inflows (before tax and depreciation) over its expected useful life are :

Tear	1	2	3	4	5
<b>Inflows Rs.</b>	10,000	10,000	15,000	15,000	25,000

Determine

- (1) Payback period and profitability
- (2) A.R.R. (Before Tax)

**(c) Discounting Techniques**

The techniques we saw earlier were non discounting techniques. They ignored time value of money concept. However in reality money has time value. Capital collected for the project does not come free.

The exercise involved in calculating the present value is known as discounting and the factors by which we have multiplied the cash flows are known as the discount factors.

The discount factor is given by the following expression :  $\left[ \frac{1}{(1+r)^n} \right]$

Where 'r' is the rate of interest per annum and 'n' is the number of years over which we are discounting.

The cash flows thus calculated should be discounted, by multiplying the cash flows by the discounted factor.

Calculating discounted cash flows on calculator,  
Let say we want to calculate discounting factor  
for 10% for five years

$$\begin{aligned}
 1.1 \div \div &= 0.909 \\
 &= 0.826 \\
 &= 0.751 \\
 &= 0.683 \\
 &= 0.621
 \end{aligned}$$

Discounted cash flow is an evaluation of the future net cash flows generated by a capital project, by discounting them to their present day value. One of the main disadvantage of both payback and accounting rates of return method is that they ignore the fact that money has time value. The discounting technique converts cash inflows and outflows for different years into their respective values at the same point of time, allows for the time value of money.

**(d) Discounting Payback :**

This is a discounted technique. It is very much similar to payback, however the cash flows have to be discounted to relevant years.



**Question 6 – DFC Ltd.**

DCF Ltd. is implementing a project with an initial capital outlay of Rs. 8,000. Its cash inflows are as under :

Year Cash inflow	
Year	Rs.
1	6,000
2	2,000
3	1,000
4	5,000

The expected rate of return is 12% p.a. Calculate the discounted payback period of the project.

**(e) Net Present Value :**

The objective of the firm is to create wealth by using existing and future resources to produce goods and services. To create wealth, inflows must exceed the present value of all anticipated cash outflows. Net present value is obtained by discounting all cash outflows and inflows attributable to a capital investment project by a chosen percentage e.g., the entity's weighted average cost of capital. The method discounts the net cash flows from the investment by the minimum required rate of return, and deducts the initial investment to give the yield from the funds invested. If yield is positive the project is acceptable. If it is negative the project is unable to pay for itself and is thus unacceptable.

**Merits and Demerits :** The merits and demerits of NPV method are summarised below:

**Merits :**

- It is based on the assumption that cash flows, and hence dividend, determine shareholders' wealth.
- Cash flows are more realistic yardstick than profits. Profit, an accounting concept, suffer from lot of disadvantages.
- It recognises the time value of money.
- It considers the total benefits arising out of proposals over its life-time.
- The future discount rate normally varies due to longer time span. This rate can be applied in calculating the NPV by altering the denominator.
- This method is particularly useful for the selection of naturally exclusive projects. (in mutually exclusive projects acceptance of one project tantamount to rejection of the other project).
- This method of project selection is instrument in achieving the financial objective. i.e, the maximisation of the shareholders wealth.

**Demerits :**

- It is difficult to calculate as well as understand it as compared to accounting rate of return method or payback method.
- Calculation of the desired rates of return presents serious problems. Generally cost of capital is the basis of determining the desired rate. The calculation of cost capital is itself complicated. Moreover, the project rates of return will vary from year to year.
- This method is an absolute measure. When two projects are being considered, this method will favour the project which has higher NPV.
- The method may not give satisfactory result where two projects having different effective lives are being compared, Normally, the project with shorter economic life is preferred, if other things are equal. This method does not attach importance to the shorter economic life of the project.
- These methods emphasise on the net present value and disregard the initial investment involved. Thus, this method may not give dependable results.



**Question 7 – DCF Ltd.**

DCF Ltd. is implementing a project with an initial capital outlay of Rs. 8,000. Its cash inflows are as under :

Year Cash inflow	
Year	Rs.
1	6,000
2	2,000
3	1,000
4	5,000

The expected rate of return is 12% p.a. Calculate Net Present Value and comment if the project should be taken up.



**Question 8 – Bharati Enterprise**

Bharati Enterprise wants to introduce a new product with estimated sales of 5 years. The manufacturing equipment cost Rs.5,00,000; with scrap value of Rs.30,000 at end of 5 years.

The working capital is Rs.40,000, will be after 5 years. The annual Net profit before Depreciation and Tax and P.V. factor @10% are

Years	P.V. factor	Rs.
1	0.909	250000
2	0.826	300000
3	0.751	375000
4	0.683	360000
5	0.621	225000

The depreciation to be charged under SLM. The applicable tax rate will be 40% Evaluate the proposal.

**(f) Profitability Index (PI) Method :**

Profitability Index is one step ahead of NPV. It is very useful to select project if we are comparing two or more projects, which have different initial investments and funds with the company are limited.

**Decisions**

PI > 1, accept the project

PI < 1, accept the project

**Merits :**

- 1) It considers time value of money
- 2) Projects can be ranked in accordance to their profitability index.
- 3) A number of proposals each involving different amount of cash flows can be compared using this method.

**Demerits :**

- 1) It involves complex calculations.
- 2) Decisions may be incorrect when it involves mutually inclusive projects.



**Question 9 – Chhadwa Ltd.**

Chhadwa Ltd. is implementing a project with an Initial Capital Outlay of Rs. 8,000. Its Cash Inflows are as under

Cash Inflows	
Year	Rs.
1	8000
2	4000
3	3000
4	4000
5	5000

Expected rate of return is 10% p.a. Calculate : PI

**(g) Internal Rate of Return**

Internal rate of return (IRR) is the rate at which the sum total of discounted cash inflows equals the discounted cash outflows. Unlike NPV, IRR does not use the desired rate of return but estimates the rate of return that equates the cash inflows to cash outflows. In short IRR is the rate at which  $PV(I) = PV(O)$

**Merits :**

- 1) It considers time value of money.
- 2) It considers all cash flows from investment.
- 3) Through IRR, maximum interest required to be paid to on the funds invested can be easily arrived.

**Demerits :**

- 1) It involves complex calculations
- 2) A number of rates of return makes it confusing.
- 3) It is difficult to understand.

- 4) When net cash flows are not uniform, determinations of discount rate becomes difficult.

**Steps to calculate IRR**

- 1) Calculate NPV, at discounting rate, at which NPV is positive.
- 2) Calculate NPV, at discounting rate at which NPV is negative.
- 3) IRR is between this and rate and can be calculate by using following formula

$$IRR = \text{Lower rate} + \frac{+NPV}{\sum NPV} \times \text{difference in rate}$$



**Question 10**

A company proposes to install a machine involving a Capital Cost of Rs.3,60,000. The life of the machine is 5 years and its salvage value at the end of the life is nil. The machine will produce the net operating income after depreciation of Rs.68,000 per annum. The Company’s tax rate is 45%.

The Net Present Value factors for 5 years are as under:

Discounting Rate :	14	15	16	17	18
Cumulative factor :	3.43	3.35	3.27	3.20	3.13

You are required to calculate the internal rate of return of the proposal.

**8. PRACTICAL QUESTIONS :**



**Question 11 – C Ltd.**

C Ltd. is considering investing in a project. The expected original investment in the project will be Rs.2,00,000, the life of project will be 5 year with no salvage value. The expected net cash inflows after depreciation but before tax during the life of the project will be as following:

Year	1	2	3	4	5
Rs.	85,000	1,00,000	80,000	80,000	40,000

The project will be depreciated at the rate of 20% on original cost. The company is subjected to 30% tax rate.

**Required:**

- (i) Calculate pay back period and average rate of return (ARR)
- (ii) Calculate net present value and net present value index, if cost of capital is 10%.
- (iii) Calculate internal rate of return.

Note : The P.V. factors are:

Year	P.V. at 10%	P.V. at 37%	P.V. at 38%	P.V. at 40%
1	.909	.730	.725	.714
2	.826	.533	.525	.510
3	.751	.389	.381	.364
4	.683	.284	.276	.260
5	.621	.207	.200	.186



**Question 12**

A company is considering the proposal of taking up a new project which requires an investment of Rs.400 lakh on machinery and other assets. The project is expected to yield the following earnings (before depreciation and taxes) over the next five years:

Year	Earnings (Rs. in lakh)
1	160
2	160
3	180
4	180
5	150

The cost of raising the additional capital is 12% and assets have to be depreciated at 20% on 'Written Down Value' basis. The scrap value at the end of the five years' period may be taken as zero. Income-tax applicable to the company is 50%.

You are required to calculate the net present value of the project and advise the management to take appropriate decision. Also calculate the Internal Rate of Return of the Project.

Note: Present value of Re. 1 at different rates of interest are as follows:

Year	10%	12%	14%	16%
1	0.91	0.89	0.88	0.86
2	0.83	0.8	0.77	0.74
3	0.75	0.71	0.67	0.64
4	0.68	0.64	0.59	0.55
5	0.62	0.57	0.52	0.48



**Question 13**

A Company is considering a proposal of installing a drying equipment. The equipment would involve a Cash outlay of Rs.6,00,000 and net Working Capital of Rs.80,000. The expected life of the project is 5 years without any salvage value. Assume that the company is allowed to charge depreciation on straight-line basis for Income-tax purpose. The estimated before-tax cash inflows are given below:

Year	Before-tax Cash inflows (Rs.'000)				
	1	2	3	4	5
	240	275	210	180	160

The applicable Income-tax rate to the Company is 35%. If the Company's opportunity Cost of Capital is 12%, calculate the equipment's discounted payback period, payback period, net present value and internal rate of return.

The PV factors at 12%, 14% and 15% are:

Year	1	2	3	4	5
PV factor at 12%	0.8929	0.7972	0.7118	0.6355	0.5674
PV factor at 14%	0.8772	0.7695	0.675	0.5921	0.5194
PV factor at 15%	0.8696	0.7561	0.6575	0.5718	0.4972





**Question 14**

A company has to make a choice between two projects namely A and B. The initial capital outlay of two Projects are Rs 1,35,000 and Rs 2,40,000 respectively for A and B. There will be no scrap value at the end of the life of both the projects. The opportunity Cost of Capital of the company is 16%. The annual incomes are as under:

Year	Project A	Project B	Discounting factor @ 16%
1	–	60,000	0.862
2	30,000	84,000	0.743
3	1,32,000	96,000	0.641
4	84,000	1,02,000	0.552
5	84,000	90,000	0.476

You are required to calculate for each project:

- (i) Discounted payback period
- (ii) Profitability index
- (iii) Net present value.



**Question 15 – PR Engineering Ltd.**

PR Engineering Ltd. is considering the purchase of a new machine which will carry out some operations which are at present performed by manual labour. The following information related to the two alternative models – ‘MX’ and ‘MY’ are available:

	Machine ‘MX’	Machine ‘MY’
Cost of Machine	Rs. 8,00,000	Rs. 10,20,000
Expected Life	6 years	6 years
Scrap Value	Rs. 20,000	Rs. 30,000

Estimated net income before depreciation and tax:

Year	Rs.	Rs.
1	2,50,000	2,70,000
2	2,30,000	3,60,000
3	1,80,000	3,80,000
4	2,00,000	2,80,000
5	1,80,000	2,60,000
6	1,60,000	1,85,000

Corporate tax rate for this company is 30 percent and company’s required rate of return on investment proposals is 10 percent. Depreciation will be charged on straight line basis.

You are required to:

- (i) Calculate the pay-back period of each proposal.
- (ii) Calculate the net present value of each proposal, if the P.V. factor at 10% is – 0.909, 0.826, 0.751, 0.683, 0.621 and 0.564.
- (iii) Which proposal you would recommend and why?



**Question 16 – Patel Electronics**

Patel Electronics wants to take up a new project of the manufactured if an electronic device which has good market. Further details are given below :

- (i) Cost of project as estimated Rs. lakhs

- Land 9.00 (will be incurred at the beginning of year 1)  
 Building 6.00 (will be incurred at beginning of 2nd year)  
 Machinery 10.00 (will be incurred at end of year 2)  
 Working Capital (margin money) 5.00 (will be incurred at the beginning of year 3)
- (ii) The project will go into production from the beginning of year 3 and will be operational for period of 5 years.  
 The annual working results are estimated as follows :

Rs. in Lakhs	
Sales	40.00
Less : Variable Cost	16.00
Fixed Cost (Excluding depreciation	8.00
Depreciation of assets	4.00

- (iii) At the end of the operational period, it is expected that the fixed assets can be sold for Rs. 5 lakhs. (without profit)
- (iv) Cost of Capital of firm is 10% tax rate 50%

**P.V of Re. 1 at 10%.**

At end of the year	P.V.
1	0.909
2	0.826
3	0.751
4	0.683
5	0.621
6	0.564
7	0.513
8	0.467

You are required to evaluate the proposal, by working out N.P.V & advise firm.



**Question 17 – Katrina Ltd.**

Katrina Ltd., a highly profitable company, is engaged in manufacture of power intensive products. As part of its diversification plans, the company purpose to put up a windmill to generate Electricity.

The details of scheme our as follows.

- (1) Cost of wind mill Rs. 600 lakhs.
- (2) Cost of hand Rs. 30 Lakhs.
- (3) Subs idly from state government to be received at end of 1st year of installation Rs. 30 lakhs.
- (4) Cost of Electricity will be Rs. 4.50 per unit in year 1. This will increase by Re. 0.50 per unit every year till year 7. After that it will increase by Rs. 1 per unit.
- (5) Maintenance cost will be Rs. 8 lakhs in year 1 and same will increase by Rs. 4 lakhs every year.
- (6) Estimated life 10 years.  
 Cost of Capital 15%
- (8) Residual value of windmill will be nil however land will go up to Rs. 120 lakhs, at end of year 10.

- (9) Depreciation will be 100% of the cost of windmill in year 1 & same allowed for tax purpose.
- (10) as windmills are expected to work based on wind velocity the efficiencies is expected to be average 30%. Gross Electricity Generated at this level will be 25 lakhs per unit per annum. 4% of this electricity generated will be committed free to the state electricity board as per the agreement.
- (11) Tax rate is 50%.  
 From the above Information you are required to
- \* Calculate NPV (Ignore tax or Capital Profits)
  - \* List down two non-financial factors that should be considered before taking a decision.

For your Exercise use the following discount factors.

Year	1	2	3	4	5	6	7	8	9	10
Discount factors	0.87	0.76	0.66	0.57	0.50	0.43	0.38	0.33	0.28	0.25



**Question 18 – X Ltd.**

X Ltd. an existing profit-making company, is planning to introduce a new product with a projected life of 8 years. Initial equipment cost will be Rs.120 lakhs and additional equipment costing Rs.10 lakhs will be needed at the beginning of third year. At the end of the 8 years, the original equipment will have resale value equivalent to the cost of removal, but the additional equipment would be sold for Rs.1 lakh. Working capital of Rs.15 lakhs will be needed. The 100% capacity of the plant is of 4,00,000 units per annum, but the production and sales-volume expected are as under:

Year	Capacity in Percentage
1	20
2	30
3-5	75
6-8	50

A sale price of Rs.100 per unit with a profit volume ratio of 60% is likely to be obtained. Fixed Operating Cash Cost are likely to be ` 16 lakhs per annum. In addition to this the advertisement expenditure will have to be incurred as under:

Year	1	2	3-5	6-8
Expenditure in Rs. Lakhs each year	30	15	10	4

The company is subjected to 50% tax, straight-line method of depreciation, (permissible for tax purposes also) and taking 12% as appropriate after tax cost of Capital, should the project be accepted?



**Question 19 – XYZ Ltd.**

XYZ Ltd. is planning to introduce a new product with a project life of 8 years. The project is to be set up in Special Economic Zone (SEZ), qualifies for one time (at starting) tax free subsidy from the State Government of Rs.25,00,000 on capital investment. Initial equipment cost will be Rs.1.75 crores. Additional equipment costing Rs.12,50,000 will be purchased at the end of the third year from the cash inflow of this year. At the end of 8 years, the original equipment will have no resale value, but additional equipment can be sold for Rs.1,25,000. A working capital of Rs.20,00,000 will be needed and it will be released at the end of eighth year. The project will be financed with sufficient amount of equity capital.

The sales volumes over eight years have been estimated as follows:

Year	1	2	3	4–5	6–8
Units	72,000	1,08,000	2,60,000	2,70,000	1,80,000

A sales price of Rs.120 per unit is expected and variable expenses will amount to 60% of sales revenue. Fixed cash operating costs will amount ` 18,00,000 per year. The loss of any year will be set off from the profits of subsequent two years. The company is subject to 30 per cent tax rate and considers 12 per cent to be an appropriate after tax cost of capital for this project.

The company follows straight line method of depreciation.

Required:

Calculate the net present value of the project and advise the management to take appropriate decision.

Note:

The PV factors at 12% are

Year	1	2	3	4	5	6	7	8
	.893	.797	.712	.636	.567	.507	.452	.404



**Question 20**

A company is setting up a project at a cost of Rs. 330 lakhs. It has to decide whether to locale the plant in a forward area (FA) or backward area (BA). Locating in backward area means a cash subsidy of Rs. 15 lakhs from the Central Government. Besides, the taxable profits to the extent of 20 per cent are exempt for 10 years. The Project envisages a borrowing of Rs. 200 lakhs in either case. The cost of borrowing will be 12 per cent in forward area and 10 per cent in backward area. However, the revenue costs are bound to be higher in backward area, The borrowing have to be repaid in 4 equal annual installments beginning from the end of the fourth year. With the help of following information and by using DCF Techniques you are required to suggest the proper location for the project:

Year	Profit (Loss) before interest and depreciation (Rs. Lakhs)		Present value factor (15%)
	FA	BA	
1	(6.00)	(50.00)	0.87
2	34.00	(20.00)	0.76
3	54.00	10.00	0.66
4	74.00	20.00	0.57
5	108.00	45.00	0.50
6	142.00	100.00	0.43
7	156.00	155.00	0.38
8	230.00	190.00	0.33
9	330.00	230.00	0.28
10	430.00	330.00	0.25

The annual depreciation may be taken at Rs 30 lakhs. Interest on borrowings may be worked out at the respective rate ,Average rate of tax may be taken as 50 per cent.

**9. EQUIVALENT NPV :**

When we are comparing two project, with different lives, the concept of Equivalent NPV comes handy. We, obviously, can't compare NPV of two project with different lives. For eg

Project X will run for 5 years and give an NPV of Rs. 10,000 and Project Y will run for 8 years and give an NPV of Rs. 14,000. By comparing NPV's we will draw a wrong conclusion that Project Y is better than Project X. However it is quite evident that Project X gave that NPV in 5 years and Project Y in 8 years. We need some sought of averaged figure to compare. However that average can't be calculated by dividing X by 3 and Y by 5. Following are the steps to calculate Equivalent NPV

Step 1 : Calculate NPV as usual

Step 2 : Calculate Equivalent NPV

$$\text{Equivalent NPV} = \frac{\text{Normal NPV}}{\text{Cumulative Discounting Factor for } x \text{ years}}$$



**Question 21 – Company UVW**

Company UVW has to make a choice between two identical machines, in terms of Capacity, 'A' and 'B'. They have been designed differently, but do exactly the same job. Machine 'A' costs Rs.7,50,000 and will last for three years. It costs Rs.2,00,000 per year to run.

Machine 'B' is an economy model costing only Rs.5,00,000, but will last for only two years. It costs Rs.3,00,000 per year to run.

The cash flows of Machine 'A' and 'B' are real cash flows. The costs are forecasted in rupees of constant purchasing power. Ignore taxes. The opportunity cost of capital is 9%.

Required:

Which machine the company UVW should buy?

The present value (PV) factors at 9% are:

Year	t <sub>1</sub>	t <sub>2</sub>	t <sub>3</sub>
PVIF <sub>0.09,t</sub>	0.9174	0.8417	0.7722



**Question 22**

A company is required to choose between two machines A and B. The two machines are designed differently, but have identical capacity and do exactly the same job. Machine A costs Rs.6,00,000 and will last for 3 years. It costs Rs.1,20,000 per year to run.

Machine B is an 'economy' model costing Rs.4,00,000 but will last only for two years, and costs Rs.1,80,000 per year to run. These are real cash flows. The costs are forecasted in rupees of constant purchasing power. Opportunity cost of capital is 10%.

Which machine company should buy? Ignore tax.

PVIF<sub>0.10, 1</sub> = 0.9091, PVIF<sub>0.10, 2</sub> = 0.8264, PVIF<sub>0.10, 3</sub> = 0.7513.



**Question 23**

A Company which is in the 40% tax bracket, has to purchase any one of two machines P and Q for one of its factories. The following details are available in respect of the two machines -

Machine	P	Q
Cost of Machine, including installation costs	Rs. 20,50,000	Rs. 36,00,000
Useful Life	5 years	8 years

Cash Operating Expenses for the Machine	Rs. 6,00,000	Rs. 3,40,000
Scrap Value	Rs. 50,000	Rs. 80,000

**Note:** The appropriate discount rate for the Company is 12%

Using appropriate evaluation criterion, determine which machine should be purchased. Assume cash flows to perpetuity and that the cost of removal of the assets at the end of their useful life will equal their salvage values.



**Question 24**

Given below are the data on a capital project 'M':

Annual cost saving	Rs.60,000
Useful life	4 years
Internal rate of return	15 %
Profitability index	1.064
Salvage value	0

You are required to calculate for this project M:

- (i) Cost of project
- (ii) Payback period
- (iii) Cost of capital
- (iv) Net present value.

Given the following table of discount factors:

Discount factor	15%	14%	13%	12%
1 year	0.87	0.88	0.89	0.89
2 years	0.76	0.77	0.78	0.8
3 years	0.66	0.68	0.69	0.71
4 years	0.57	0.59	0.61	0.64
	2.86	2.91	2.97	3.04

**10. NPV VS IRR :**



**Question 25**

The cash flows of two mutually exclusive Projects are as under:

	t <sub>0</sub>	t <sub>1</sub>	t <sub>2</sub>	t <sub>3</sub>	t <sub>4</sub>	t <sub>5</sub>	t <sub>6</sub>
Project 'P' (Rs.)	(40,000)	13,000	8,000	14,000	12,000	11,000	15,000
Project 'J' (Rs.)	(20,000)	7,000	13,000	12,000	-	-	-

**Required:**

- (i) Estimate the net present value (NPV) of the Project 'P' and 'J' using 15% as the hurdle rate.
- (ii) Estimate the internal rate of return (IRR) of the Project 'P' and 'J'.
- (iii) Why there is a conflict in the project choice by using NPV and IRR criterion?
- (iv) Which criteria you will use in such a situation? Estimate the value at that criterion. Make a project choice.

The present value interest factor values at different rates of discount are as under:

Rate of discount	t <sub>0</sub>	t <sub>1</sub>	t <sub>2</sub>	t <sub>3</sub>	t <sub>4</sub>	t <sub>5</sub>	t <sub>6</sub>
0.15	1.00	0.8696	0.7561	0.6575	0.5718	0.4972	0.4323
0.18	1.00	0.8475	0.7182	0.6086	0.5158	0.4371	0.3704

0.20	1.00	0.8333	0.6944	0.5787	0.4823	0.4019	0.3349
0.24	1.00	0.8065	0.6504	0.5245	0.423	0.3411	0.2751
0.26	1.00	0.7937	0.6299	0.4999	0.3968	0.3149	0.2499



**Question 26**

The cash flows of projects C and D are reproduced below:

Project	Cash Flow				NPV	
	C <sub>0</sub>	C <sub>1</sub>	C <sub>2</sub>	C <sub>3</sub>	at 10%	IRR
C	- Rs.10,000	+ 2,000	+ 4,000	+ 12,000	+ Rs.4,139	26.50%
D	- Rs.10,000	+ 10,000	+ 3,000	+ 3,000	+ Rs.3,823	37.60%

- (i) Why there is a conflict of rankings?
- (ii) Why should you recommend project C in spite of lower internal rate of return?

Time	Period		
	1	2	3
PVIF <sub>0.10, t</sub>	0.909	0.826	0.751
PVIF <sub>0.14, t</sub>	0.877	0.77	0.675
PVIF <sub>0.15, t</sub>	0.87	0.756	0.658
PVIF <sub>0.30, t</sub>	0.769	0.592	0.455
PVIF <sub>0.40, t</sub>	0.714	0.51	0.364



**Question 27**

Consider the following mutually exclusive projects:

Projects	Cash flows (Rs.)				
	C <sub>0</sub>	C <sub>1</sub>	C <sub>2</sub>	C <sub>3</sub>	C <sub>4</sub>
A	-10,000	6,000	2,000	2,000	12,000
B	-10,000	2,500	2,500	5,000	7,500
C	-3,500	1,500	2,500	500	5,000
D	-3,000	0	0	3,000	6,000

**Required :**

- (i) Calculate the payback period for each project.
- (ii) If the standard payback period is 2 years, which project will you select? Will your answer differ, if standard payback period is 3 years?
- (iii) If the cost of capital is 10%, compute the discounted payback period for each project.  
Which projects will you recommend, if standard discounted payback period is (i) 2 years; (ii) 3 years?
- (iv) Compute NPV of each project. Which project will you recommend on the NPV criterion?

The cost of capital is 10%. What will be the appropriate choice criteria in this case? The PV factors at 10% are:

Year	1	2	3	4
PV factor at 10% (PV/F 0.10, t)	0.9091	0.8264	0.7513	0.6830



**11. REPLACEMENT DECISION:**

In such problems, we shall be provided with decision situations wherein we have an asset, which is up and running and we have been offered a new machine with improved performance in terms of capacity and output. We have been asked to decide whether we should replace the old machine with a new one. In such cases we shall calculate Incremental NPV. The thinking that students should adopt of incremental / differential i.e NEW – OLD.



**Question 28 – MNP Limited**

MNP Limited is thinking of replacing its existing machine by a new machine which would cost Rs.60 lakhs. The company’s current production is Rs.80,000 units, and is expected to increase to 1,00,000 units, if the new machine is bought. The selling price of the product would remain unchanged at Rs.200 per unit. The following is the cost of producing one unit of product using both the existing and new machine:

**Unit cost (Rs.)**

	Existing Machine (80,000 units)	New Machine (1,00,000 units)	Difference
Materials	75	63.75	(11.25)
Wages & Salaries	51.25	37.5	(13.75)
Supervision	20.0	25.0	5.0
Repairs and Maintenance	11.25	7.50	(3.75)
Power and Fuel	15.50	14.25	(1.25)
Depreciation	0.25	5.0	4.75
Allocated Corporate Overheads	10.0	12.50	2.50
	183.25	165.5	(17.75)

The existing machine has an accounting book value of Rs.1,00,000, and it has been fully depreciated for tax purpose. It is estimated that machine will be useful for 5 years. The supplier of the new machine has offered to accept the old machine for Rs.2,50,000. However, the market price of old machine today is Rs.1,50,000 and it is expected to be Rs. 35,000 after 5years. The new machine has a life of 5 years and a salvage value of Rs.2,50,000 at the end of its economic life. Assume corporate Income tax rate at 40%, and depreciation is charged on straight line basis for Income-tax purposes. Further assume that book profit is treated as ordinary income for tax purpose. The opportunity cost of capital of the Company is 15%.

**Required:**

- (i) Estimate net present value of the replacement decision.
- (ii) Estimate the internal rate of return of the replacement decision.
- (iii) Should Company go ahead with the replacemen

Year (t)	1	2	3	4	5
PVIF <sub>0.15,t</sub>	0.8696	0.7561	0.6575	0.5718	0.4972
PVIF <sub>0.20,t</sub>	0.8333	0.6944	0.5787	0.4823	0.4019
PVIF <sub>0.25,t</sub>	0.8	0.64	0.512	0.4096	0.3277
PVIF <sub>0.30,t</sub>	0.7692	0.5917	0.4552	0.3501	0.2693
PVIF <sub>0.35,t</sub>	0.7407	0.5487	0.4064	0.3011	0.223





### Question 29 – Beta Company Limited

Beta Company Limited is considering replacement of its existing machine by a new machine, which is expected to cost Rs.2,64,000. The new machine will have a life of five years and will yield annual cash revenues of Rs.5,68,750 and incur annual cash expenses of Rs.2,95,750. The estimated salvage value of the new machine is Rs.18,200. The existing machine has a book value of Rs.91,000 and can be sold for Rs.45,500 today.

The existing machine has a remaining useful life of five years. The cash revenues will be Rs.4,55,000 and associated cash expenses will be Rs.3,18,500. The existing machine will have a salvage value of Rs.4,550, at the end of five years.

The Beta Company is in 35% tax- bracket, and write off depreciation at 25% on written-down value method.

The Beta Company has a target debt to value ratio of 15%. The Company in the past has raised debt at 11% and it can raise fresh debt at 10.5%.

Beta Company plans to follow dividend discount model to estimate the cost of equity capital.

The Company plans to pay a dividend of ` 2 per share in the next year. The current market price of Company's equity share is Rs.20 per equity share. The dividend per equity share of the Company is expected to grow at 8% p.a.

#### Required:

- (i) Compute the incremental cash flows of the replacement decision.
- (ii) Compute the weighted average cost of Capital of the Company.
- (iii) Find out the net present value of the replacement decision.
- (iv) Estimate the discounted payback period of the replacement decision.
- (v) Should the Company replace the existing machine? Advise.



### Question 30

A hospital is considering to purchase a diagnostic machine costing Rs.80,000. The projected life of the machine is 8 years and has an expected salvage value of Rs.6,000 at the end of 8 years. The annual operating cost of the machine is Rs.7,500. It is expected to generate revenues of Rs.40,000 per year for eight years. Presently, the hospital is outsourcing the diagnostic work and is earning commission income of Rs.12,000 per annum; net of taxes.

#### Required:

Whether it would be profitable for the hospital to purchase the machine? Give your recommendation under:

- (i) Net Present Value method
- (ii) Profitability Index method.

PV factors at 10% are given below:

Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8
0.909	0.826	0.751	0.683	0.621	0.564	0.513	0.467

**12. CAPITAL RATIONING :**



**Question 31 – Venture Ltd.**

Venture Ltd has Rs. 30 Lakhs available for investment in capital projects. It has the option of making investment in projects 1,2, 3 and 4. Each project is entirely independent and has a useful life of 5 years. The expected Present Values of Cash Flows from the projects are as follows –

Projects	Initial Outlay	Present Value of Cash Flows X
1	Rs.8,00,000	Rs.10,00,000
2	Rs.15,00,000	Rs.19,00,000
3	Rs.7,00,000	Rs.11,40,000
4	Rs.13,00,000	Rs.20,00,000

Which of the above investments should be undertaken? Assume that Cost of Capital is 12% and Risk Free Interest Rate is 10% per annum. Given compounded sum of Rs.1 at 10% in 5 years is Rs.1.611 and Discount Factor of Rs.1 at 12% Rate for 5 years is 0.567.



**Question 32 – Alpha Ltd.**

Alpha Ltd. is considering five Capital Projects for the years 2010, 2011, 2012 and 2013. The Company is financed by Equity entirely and its cost of capital is 12%. The expected cash flows of the projects are as follows :-

**Year and Cash Flows (Rs.000s) (figures in brackets represent outflows)**

Project	2010	2011	2012	2013
A	(70)	35	35	20
B	(40)	(30)	45	55
C	(50)	(60)	70	80
D	-	(90)	55	65
E	(60)	20	40	50

All projects are divisible, i.e. size of investment can be reduced, if necessary in relation to availability of funds. None of the projects can be delayed or undertaken more than once.

Calculate which project Alpha Ltd. should undertake, if the capital available for investment is limited to Rs.1,10,000 in year 2010 and with no limitation in subsequent years. Use the following PV factors.

Year	2000	2001	2002	2003
Discounting Factor	1.00	0.89	0.80	0.71

Would your answer be different if the projects were indivisible and full utilisation of budget is a primary consideration in decision-making?

13. MIRR :



**Question 33**

An investment of Rs.4,00,000 yields the following cash inflows. Determine the MIRR if the cost of capital = 10%

Year	1	2	3	4	5
CFAT Rs.	80000	90000	1,50,000	1,00,000	80,000

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Thanks ....



## CHP - 10

# Time Value of Money



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### CONCEPTS COVERED

1. INTRODUCTION
2. REASONS FOR TIME VALUE OF MONEY
3. VALUATION CONCEPTS
4. FUTURE VALUE CONCEPT
  - (a) SIMPLE INTEREST
  - (b) COMPOUND INTEREST
    - (i) SINGLE CASH FLOWS
    - (ii) MULTIPLE CASH FLOWS
    - (iii) ANNUITY
    - (iv) ANNUITY DUE/IMMEDIATE
5. EFFECTIVE RATE OF INTEREST

### CONCEPTS COVERED

6. PRESENT VALUE CONCEPTS
  - (a) SINGLE CASH FLOW
  - (b) MULTIPLE CASH FLOW
  - (c) ANNUITY
  - (d) ANNUITY DUE/ IMMEDIATE
7. PERPETUITY
8. GROWING PERPETUITY

## 1. INTRODUCTION :

Hi Guys, i don't know why, but there is a general perception that what is simple is not valuable. Ya! It's like shopping, we value something that comes expensive. But guys the chapter that I am now gonna teach you is the simplest, yet the most powerful tool in the world of finance, yup – It's 'TIME VALUE OF MONEY'.

The name itself – “Time value of money” is appealing. It says money has time value – don't you believe it – Let me put a simple question to you

✚ If your dad offers you Rs. 10,000 today or you have an option to wait for the same and take it after 3 months after exams. What would be your call ?

Take it another way around

✚ If you are to pay Rs. 10,000 today and suppose you are offered to delay the payment by a year. Would you not grab that opportunity? You would, infact you would want to kiss that person and say thank you, Do it.

Why would you do this ? The answer to this question is very simple, its because money has time value.

Money has time value. A rupee today is more valuable than a rupee a year hence. Why? There are several reasons:

## 2. REASONS FOR TIME VALUE OF MONEY :

Now, why? Why Rs. 100 today is more valued than in future. During my school days, my pocket money was Rs. 500 and alike you all, had an habit of crying on it always, thinking it's too less and use to run across my mom and ask her to tell dad to increase the same. And guys my dad always had the legacy story to tell “You know Rahul – when i came to Mumbai, my dad gave me Rs. 100 and said go beta and make your future” Rs. 100 ! and future! Might be lying ! Then he said he came to Mumbai and survived for 3 months on that hundred. I always thought it was not possible. But after learning this chapter i am sure that Rs. 100 in those days was like a lakh today. Here are some of the reasons, why time has money value.

✚ **Present v/s Future** : “you are in a hospital bed, urgently need an injection costing Rs. 5000, and you have no cash, but can get the same in a week” can you ask god to wait for a week. No!

Now jokes apart, guys you will always prefer current consumption to future consumption. Today is what it counts. Do you agree?

✚ **Inflation** : Rise in price of the commodity is known as inflation. Causes of inflation are many, but the fact it exist. In an inflationary period a rupee today represents a greater real purchasing power than a rupee a year hence.

To illustrate, I remember my school days, going for a movie with parents. Can you guess , how much did the ticket cost, how much did the pop corn cost. Tickets costed Rs. 20 (that to balcony, which was considered upper class stuff) and pop corn costed

Rs. 2. And Now ! just yesterday i landed in PVR paying for Rs 250 per ticket and Rs. 150 for pop corn.

Its not the figure, that is printed on the currency that values money. Its the power of the currency that determines its value. What we can do with it, matter the most.

Now if you wanna borrow Rs 10,000 from person, he is sacrificing some of his wants, that has to be compensated in future, which will cost more. So Rs. 10,000 today will become Rs. 11,000 after a year.

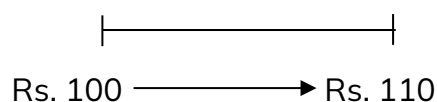
- ✚ **Risk :** Future is full of uncertainty. I would feel more safe with Rs. 100 in pocket today than a promise of Rs. 100 tomorrow. Now if, we take that risk of handing that Rs. 100 to someone for certain period, don't we need to be paid for that risk! We do. We will need return for the risk undertaken. Therefore capital can be employed productively to generate positive returns. An investment of rupee one today would grow to  $(1+r)$  a year hence ( $r$  is the rate of return earned on the investment).

Most of the financial problems involve cash flows occurring at different points of time. For evaluating such cash flows an explicit consideration of the time value of money is required. This chapter discusses the methods for dealing with the time value of money- these methods have applications in various areas of financial analysis.

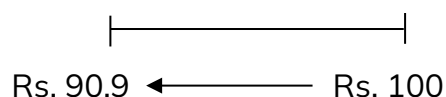
### 3. VALUATION OF CONCEPTS :

Money has – The Future Value and The Present Value.

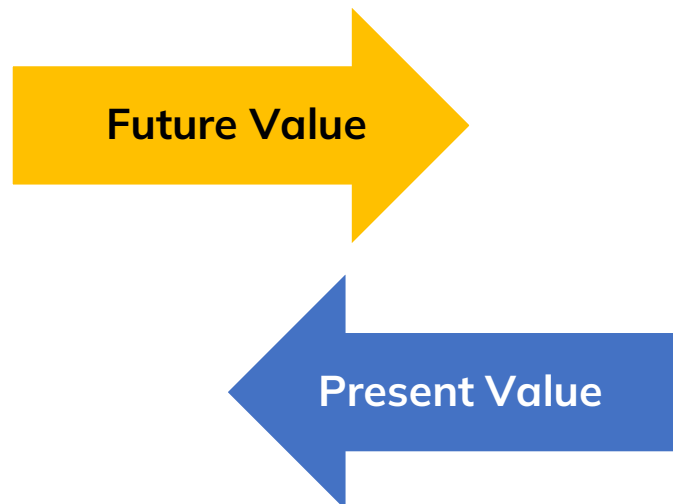
1. **The Future Value :** A person will have to pay more in future for a rupee received today. The concept involves compounding.



2. **The Present Value :** A person will have to accept less today for a rupee to be received in future. The concept involved discounting.

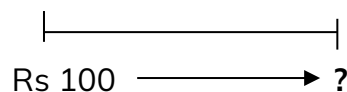


- ✚ What makes Rs 100 today grow to Rs. 110 after a year or what makes Rs. 100 after a year come down to Rs. 90.9 today is the "Interest Rate" – The time value of money. It is known as compounding (compound rate) if applied to calculate future value (and you have learned this in school) and its known as discounting (discount rate) when applied to calculate present value(that you will master with me, in this chapter).



#### 4. FUTURE VALUE CONCEPT :

As Discussed earlier it is the value of money held presently at some given time in future



#### SIMPLE INTEREST CONCEPT :

Simple interest is an amount calculated by applying simple percentage on a given amount. The amount is known as principle.

#### Formula :

$$SI = P * N * R$$

SI – SIMPLE INTEREST  
 P – PRINCIPLE  
 N – NO. OF YEARS  
 R – RATE OF INTEREST

If we ADD principle to interest, we get the total amount (FV) at the end of that period.

$$\text{Amount (FV)} = P + SI$$



#### Question 1 – RM

RM deposits Rs.20,000 in a bank for 5 yrs @ 12%, what will be amount at the end of 5 years.



#### Question 2

Calculate the Simple interest and future value if the amount of Rs.50,000 was invested @ 10% for (a) 3 months (b) 6 months (c) 1 year (d) 2 years (e) 73 days



#### Question 3 – Mr.RM

Mr. RM receives Rs.3,200 at the end of sixth year. He had deposited Rs.2,000 six years ago. What is the rate of simple interest?





**Question 4 – RM**

RM borrowed Rs.1000 3 months ago and he owes Rs.1025 now. He has requested you to calculate the rate of simple interest? Please do the needful to complete his request?



**Question 5 – RM**

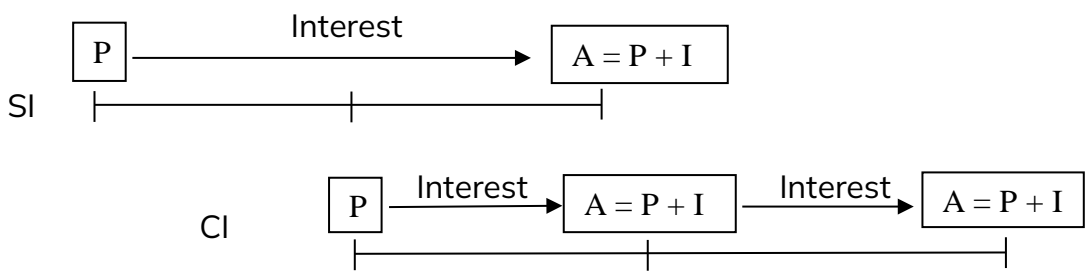
RM invest Rs.50,000 in bank @ 8.5% simple interest and receives Rs.69,125 on maturity. Find the period for which the amount was invested by RM.

**COMPOUND INTEREST CONCEPT :**

In the above concept i.e simple interest, interest was calculated on the principal amount. In the concept of compound interest, the interest earned on the principle amount is added to amount at the end of compounding period. The next interest on the principle amount which is the total of previous principle + interest. This process will continue till maturity.

- i.e interest (1) for a period = Principle (0) x rate of interest
- New Principle (1) = Principle (0) + Interest 1
- interest (2) for next period = Principle (1) x rate of interest
- New Principle (2) = Principle (1) + Interest 2 ..... . . . and so on

**Common Sense :** The amount calculated on maturity will be higher if calculated on compound interest basis, as compared to simple interest basis.



**Questions 6**

Rs.1000 is invested at 10%. Calculate the amount at the end of 3 yrs under

- a) Simple interest
- b) Compound Interest (compounded annually)

**Single Cash Flows :**



**Question 7 – RM**

RM invested Rs.20,000 in fixed deposit for 5 years at 8% interest (compounded annually). What will be the total amount on maturity.



**Question 8 – RM**

RM decides to invest Rs.15,000 @ 6% compounded semi annually for 4 yrs. Calculate the amount at the end of 4 yrs.



**Question 9 – RM**

RM invest Rs.5,000 in bank @ 10%. What should be the amount after 2 yrs if compounding is done (a) Annually (b) semi Annually (c) Quarterly (d) Monthly and (e) Daily



**Question 10**

A company offers a fixed deposit scheme, whereby Rs. 30,000 matures to Rs. 37,875 after 2 years, on a half – yearly compounding basis. Calculate the rate of interest. Also what shall be the amount if the amount is compounded on quarterly basis.



**Question 11**

What would be the annual rate of interest compounded annually doubles as investment in 7 yrs, given that  $(2)^{1/7} = 1.104090$

**Multiple Cash Flows :**

The transactions in real life are not limited to single outflow. Means investor may decide to invest multiple cash deposits and will be interested to find the value on the maturity. I have illustrated this in the question below.

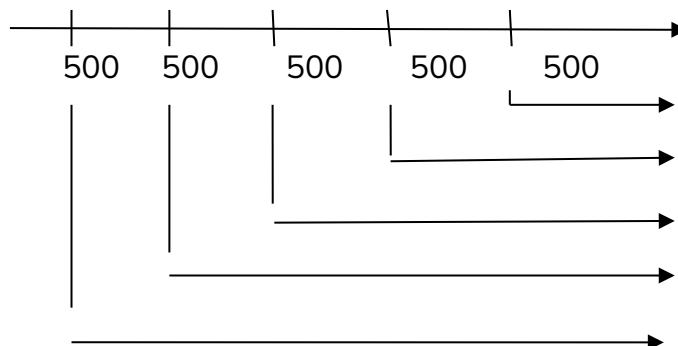


**Question 12 – RM**

RM invest Rs.5,000 in first year, Rs.6,000 in second year, and Rs. 8,000 in third year @ 10%. What will RM receive at the end of 5<sup>th</sup> year compounding is done annually.

**Future Value of Annuity :**

Annuity is a stream of regular periodic payments made or received for a specified period of time. Incase of Future value of annuity means the maturity value of regular cash outflows made at specified intervals. For eg. Investor depositing Rs. 500 every month for 5 years. Let us solve this example.



**Question 13 – RM**

RM invests Rs.500 annually for 7 yrs at an interest rate of 14% compounded annually, what will he get after 7 yrs?



**Question 14 – RM**

RM is interested in finding the annuity for 3 equal yearly payments for Rs.20,000 that yields 7% compounded yearly



**Question 15 – RM**

RM makes 10 monthly payments of Rs.500 each @ 6% P.A compounded monthly. What shall RM receive at the end of 10<sup>th</sup> month.

**Future Value of Annuity Due or Annuity Immediate :**

The above questions were solved with the assumption that the investments were made at the end of the period. What if the investment starts today, immediate. Lets solve Question no 12 again and calculate annuity for immediate due.



**Question 16 – RM**

RM invests Rs.500 annually for 7 yrs at an interest rate of 14% compounded annually, what will he get after 7 yrs if the amount is invested at the start of the year.



**Question 17 – RM**

RM invests Rs. 10,000 every year that he receives from his mom as annual bonus over and above his regular pocket money for 10 years @ 8% compounded annually. He has received first investment today and wants starts investing today itself. Calculate what shall he receive at the end of 10<sup>th</sup> year.

**5. EFFECTIVE RATE OF INTEREST (RE) :**

The annual rate of interest, if compounded more than once, then the effective rate of interest is more than the normal rate of interest.

**For eg**

Case I – RM invests Rs. 10,000 for a year @ 10% P.A. The amount that he will receive at the end of the year will be Rs. 10,000 + 10% = Rs. 11,000.

Case II – RM invest Rs. 10,000 for a year @ 10% P.A compounded semi annually. The amount that he will receive will be Rs. 10,000 + 5% = Rs. 10,500 + 5% = Rs. 11,025.

⇒ That's what I said – the interest will be higher than the normal. The effective rate will be

Interest = Rs. 11,025 - Rs. 10,000 = Rs. 1,025.

Rate of interest = 1,025 / 10,000 x 100 = Rs. 10.25%.

Effective rate is the rate of interest for amount to be compounded more than once in a year – which will work like a simple interest. It can be calculated by the following formula

$$1 + re = \left(1 + \frac{r}{m}\right)^m$$

Where,

re = Effective rate of interest.

m = number of times compounding is done in a year.



**Question 18 – RM**

RM wants to invest Rs. 20,000 for a year. He visits his bank and asks for rate of interest that he shall earn on his investment. The bank quotes 8% P.A compounded semi

annually. He thought that he shall receive Rs. 20,000 x 1.08 = Rs. 21,600. However bank informed him that he shall receive more than that. Please prove it by using the concept of effective interest.

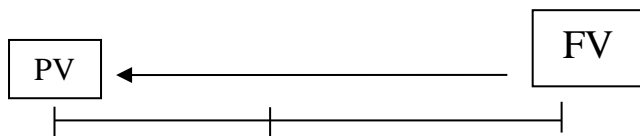


**Question 19**

Calculate effective rate of interest if bank quotes 3% P.A compounded monthly.

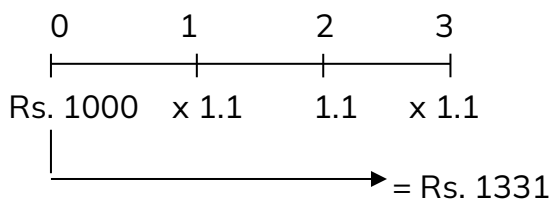
**6. PRESENT VALUE CONCEPT :**

To put it simple and straight “Present Value” is reverse of “Future Value”. In future value we asked how much shall we get after “x” years if we deposit Rs. 100 today. In Present Value we face the reverse question i.e What is the present value of Rs. 100 standing after “x” years.



By definition “Present Value” means the current value of “Future Value”. In other words it is also defined as amount to be invested today to receive future amount. The concept involved in finding the present value is known as “Discounting”. “Discounting” is opposite of “Compounding”.

**Compounding**



i.e. Rs. 1000 x (1.1)<sup>3</sup>

Compounding Factor = (1 + r)<sup>n</sup>

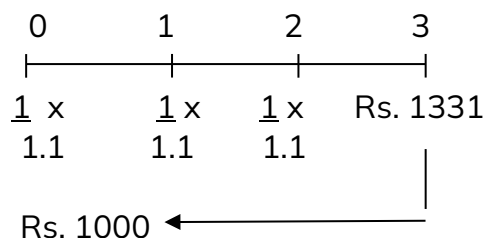
Compounding Factor is known as FVIF(i,n)

**FVIF = Future Value Interest Factor**

In the above example, the interest rate is 10% and the period is 3 yrs  
 FVIF(i,n) = FVIF (10%, 3 yrs) = (1.1)<sup>3</sup> = 1.331

- So FV = PV x (CF) FVIF
- FV = Future Value
- PV = Present Value
- CF = Compounding Factor

**Discounting**



i.e. Rs. 1000 x 1 / (1.1)<sup>3</sup>

Discounting Factor

Discounting Factor is known as PVIF(i,n)

**PVIF = Present Value Interest Factor**

PVIF(10%, 3 yrs) = 1 / (1.1)<sup>3</sup> = 0.751

Short cut : To calculate the PVIF for 10%, we should 1.1 ÷ ÷ = 0.0909 = 0.826 = 0.751

- So PV = FV x DF (PVIF)
- DF = Discounting Factor

Under the concept of Present Value we shall study



**Single Cash Flow :**



**Question 20 – Mehnaz**

If Mehnaz expects to get Rs. 100 after one year at the rate of 10%, find the amount she will have to forego today?



**Question 21 – Miss Bhumika**

Miss Bhumika needs Rs. 10000 after 3 years. She goes to Bank to enquire how much she should deposit to get the amount needed. Bank informs her that the rate of interest applicable is 10%. Please calculate the amount to be deposited by Miss Bhumika?

**Multiple Cash Flows :**

In business situations it is very natural that the returns from investments are spread over the period of time. We may receive different cash flows at different point of time.

The present value of series of cash flows can be calculated as follows

$$PV = \frac{FV_1}{(1.i)^1} + \frac{FV_2}{(1.i)^2} + \frac{FV_3}{(1.i)^3} + \frac{FV_4}{(1.i)^4} + \dots + \frac{FV_n}{(1.i)^n}$$

i.e PV = FV1 X PVIF (i,1) + FV2 X PVIF (i,2) + FV3 X PVIF (i,3) + ... FVn X PVIF (i,n)



**Question 22 – Harry Ltd.**

Harry Ltd has invested into some investment and is expected to receive future cash flows as under :

Year	1	2	3	4
Inflows	10,000	20,000	50,000	70,000

Calculate the Present value of future cash flows using 12 % as Discounting Rate.

**Present Value of Annuity :**

Annuity is a stream of regular periodic payments made or received for a specified period of time. Incase of Present value of annuity means the maturity value of regular cash inflows to be received at specified intervals. For eg. Investor receiving Rs. 500 every month for 5 years. Let us solve this example.



**Question 23 – RM**

RM receives Rs. 500 every year for 7 years. Calculate the present value of future cash inflows taking discounting Rate @ 10%



**Question 24**

Find the present value of annuity of Rs. 5000 over 5 yrs period when discounted by 12%.



**Question 25**

How much amount is required to be invested every year so as to accumulate Rs. 9,00,000 at the end of 10 years if the interest is compounded annually at 10%?

**Present Value of Annuity Due or Annuity Immediate :**

The above questions were solved with the assumption that the cash flows will start at the end of first year and so on. What if we start receiving right from today. Lets solve Question no 22 again and calculate annuity for immediate due.



**Question 26 – RM**

RM receives Rs. 500 every year for 7 years. Calculate the present value of future cash inflows taking discounting Rate @ 10%. The cash flow starts from today and then each cash flow is received at the beginning of the year.



**Question 27**

Calculate present value immediate for cash flows of Rs. 5000 to be received for 5 yrs taking discounting Rate @ 15%.

**7. PERPETUITY :**

Perpetual means continuous. Its a kind of annuity which goes on and on and on. In this case investor invest certain amount of amount, on which he shall receive certain amount every year, year after year. This concept is referred as perpetuity.

Perpetuity can be calculated by using the following formula

$$P = \frac{A}{i}$$

Where P = Perpetuity

A = Amount

i = Discounting Rate



**Question 28 – Mr.Sam**

Mr Sam is planning his retirement. He intends to have return of Rs. 1,00,000 per annum for perpetuity. If the discounting rate is 8%, calculate the present value of this perpetuity.



**Question 29**

I would retire and receive Rs. 50,000 a month. I intend to transfer this monthly payment to future generations after my death. Bank quotes him 12% P.A. How much should i invest to set aside to achieve his perpetuity goal?

## 8. GROWING PERPETUITY :

When cash flows grows at a constant rate forever, the concept is referred as growing perpetuity. It can be calculated by using the following formulae

$$P = \frac{A}{I - g}$$

Where P = Perpetuity

A = Amount

i = Discounting Rate

g = Growth



### Question 30 – Saloni

How much should Saloni pay to receive Rs. 500 every year, growing at 5%, forever, at the discount rate of 7% ?

---

Thanks ....



## CHP - 11

# Dividend Decisions



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### CONCEPTS COVERED

1. INTRODUCTION
2. WALTER MODEL
3. GORDON MODEL
4. MM MODEL – DIVIDEND IRRELEVANCE MODEL
5. CHAPTER SYNOPSIS





## 1. INTRODUCTION :

The term "dividend" refers to the portion of profit (after tax) which is distributed among the shareholders of the firm the undistributed profit is known as retained earnings.

Decision relating to payment of dividend is made by the Board of directors of the company and shareholders approve the same in the general meeting of the company. However the rate of dividend to be approved at general meeting cannot exceed the one recommended by the Board of Directors of the company.

Hence it becomes imperative for the Board of Directors to evolve dividend policy in such a manner so as to maximize the wealth of shareholders of the company.

Generally the firm pays dividend and views such payment positively. The investor also expects to receive dividend income on their investments.

The firm not paying dividend may be adversely rated by the investor affecting thereby the market value of the firm.

In other words, if dividend is not paid, uncertainty of the shareholder/investor will increase and the required rate of return ( $K_e$ ) will increase, thereby reducing the value of the firm. However, when the firm pays dividend, the current cash receipt reduces the uncertainty of the investor and he, therefore, will discount the firm at lower rate lower  $K_e$ , increasing thereby the value of the firm. And hence, it may be argued that dividend policy has an effect on the market value of the shares and the value of the firm.

## 2. WALTER MODEL :



### Question 1 – RM Education Ltd.

The following information is available in respect of RM Education Ltd.

Earnings per share                      Rs. 10 (constant)

Cost capital                                0.10 (constant)

Find out the market value of the share under following cases :

- Rate of return of 8%, 10% and 12%
- Payout ratio is 0%, 40%, 80% and 100%.



### Question 2

From the following information supplied to you, ascertain whether the firm is following an optimum dividend policy as per Walter's model ?

Total earnings                            Rs. 2,00,000

No. of Equity shares                    20,000

Dividend paid                            Rs. 1, 50,000

Price/earnings Ratio                    12.5

The firm is expected to maintain its rate of return on fresh investments. Also, find out what should be the P/E ratio at which dividend policy will have no effect on the value of the share? Will your decision change if the ratio is 8 instead of 12.5%, (Rate Of Return – 10%).



**Question 3 – XYZ Ltd.**

The following figures are collected from the annual report of XYZ Ltd.:

Net profit	Rs 30 lakh
Outstanding 12% Preference shares	Rs. 100 Lakhs
No. of Equity shares	RS 3 Lakh
Return on investment	20%
Ke	16%

What should be the approximate dividend pay-out ratio so as to keep the share price at Rs. 42 by using Walter model?



**Question 4 – RM Ltd.**

The following information pertains to RM Ltd.

Earnings of the Company	Rs. 5, 00,000
Dividend payout ratio	60%
No. of shares outstanding	1, 00,000
Equity capitalization rate	12%
Rate of return on investment	15%

- What would be the market value per share as per Walter's model?
- What is the optimum dividend payout ratio according to Walter's model and the market value of Company's share at that payout ratio?



**Question 5 – XYZ Co.**

The following information are available for XYZ CO.

- No of shares outstanding is 1 lakh
  - EPS is Rs 4
  - DPS is Rs 2.4
  - Equity capitalization rate : 12%
  - Rate of return on investment : 15%
- As per Walter’s model, what will be Market value per Share ?
  - To keep Share price at Rs 40, what should be payout ratio ?
  - As per Walter’s model, what is optimum payout ratio?
  - Market Value at that payout ratio ?

**3. GORDON MODEL :**



**Question 6 – Nishi Ltd.**

The following information is available in respect of Nishi Ltd. :

Earnings per share	Rs. 10 (constant)
Cost of Capital	0.10 (constant)

Find out the market price of the share under different rate of return, r, of 8%, 10% and 15% for different payout ratios of 0%, 40%, 80% and 100%.



**Question 7 – Rohan Musicals Ltd.**

Following information is available for Rohan Musicals Ltd.:

Earnings per share               Rs. 5  
Rate of return required       16%

Assuming the Gordon's valuation model, what rate of return should be earned on investments to ensure that the market price is Rs. 50 when the dividend payout is 40%.



**Question 8**

With the help of following figures calculate the market price of a share of a company by using:

Walter's formula

Dividend growth model (Gordon's formula)

Earnings per share (EPS)               Rs.10  
Cost of capital ( $k_e$ )                       20%  
Internal rate of return on investment   25%  
Retention ratio                               60%



**Question 9 – QB Ltd.**

The following information is given for QB Ltd.

Earning per share               Rs 12  
Dividend per share               Rs 3  
Cost of capital                       18%  
Internal Rate of Return on investment 22%  
Retention Ratio 40%

Calculate the market price per share using

(i) Gordon's formula                       (ii) Walter's formula



**Question 10**

A firm had been paid dividend at Rs 2 per share last year. The estimated growth of the dividends from the company is estimated to be 5% p.a. Determine the estimated market price of the equity share if the estimated growth rate of dividends (i) rises to 8%, and (ii) falls to 3%. Also find out the present market price of the share, given that the required rate of return of the equity investors is 15.5%.



**Question 11 – J. Ltd.**

The following information is collected from the annual reports of J. Ltd.

Profit before tax                       Rs. 2.50 crores  
Tax rate                                       40 %  
Retention Ratio                           40 %  
Number of outstanding shares       50,00,000  
Equity capitalization Rate           12 %  
Rate of Return on investment       15%

What should be the market price per share according to Gordon's Model of dividend policy?

#### 4. MM MODEL – DIVIDEND IRRELEVANCE MODEL :



##### Question 12 – SRT Ltd.

SRT Ltd. Has a capital of Rs. 10,00,000 in equity shares of Rs. 100 each. The shares are currently quoted at par. The company proposes to declare a dividend of Rs. 10 per share at the end of the current financial year. The capitalization rate for the risk class to which the company belongs is 12%.

What will be the market price of the share the end of the year if:

- A dividend is not declared?
- A dividend is declared?
- Assuming that the company pays dividend and has a net profit of Rs. 5, 00,000 and makes new investments of Rs. 10, 00,000 during the period, how many new shares must be issued? Use the MM model.



##### Question 13 – Diamond Engineering Company

Diamond Engineering Company has 10, 00,000 equity shares outstanding at the start of the accounting year 2012. The ruling market price per share is Rs. 150. The Board of Directors of the company contemplates declaring Rs. 8 per share as dividend at the end of the current year. The rate of capitalization appropriate to the risk class to which the co. belongs is 12%.

- Based on MM approach, calculate the market price per share of the company when the contemplated dividend is (i) declared and (ii) not declared.
- How many new shares are to be issued by the company at the end of the accounting year on the assumption that the net income for the year is Rs 2 crore ? Investment budget is Rs. 4 crore and (i) the above dividends are distributed and (ii) they are not distributed.
- Show that the total market value of the shares at the end of the accounting year will remain the same. Whether dividends are either distributed or not distributed. Also find out the current market value of the firm under both situations.



##### Question 14 – X Ltd.

X Ltd., has 8 lakhs equity shares outstanding at the beginning of the year 2012. The current market price per share is Rs 120. The Board of Directors of the company is contemplating Rs.6.4 per share as dividend. The rate of capitalization, appropriate to the risk-class to which the company belongs, is 9.6%:

- Based on M-M Approach, calculate the market price of the share of the company, when the dividend is – (a) declared; and (b) not declared.
- How many new shares are to be issued by the company, if the company desires to fund an investment budget of Rs 3.20 crores by the end of the year assuming net income for the year will be Rs 1.60 crores?



##### Question 15 – Buenos Aires Limited

Buenos Aires Limited has 10 lakh equity shares outstanding at the beginning of the year 2013. The current market price per share is Rs.150. The current market price per share is Rs.150. The company is contemplating a dividend of Rs.9 per share. The rate of capitalization, appropriate to its risk class, is 10%.

- (i) Based on MM approach, calculate the market price of the share of the company when:
- (1) Dividend is declared
  - (2) Dividend is not declared
- (ii) How many new shares are to be issued by the company, under both the above options, if the Company is planning to invest Rs 500 lakhs assuming a net income of Rs 200 lakhs by the end of the year?

## 5. CHAPTER SYNOPSIS :

### THEORIES OF DIVIDEND POLICY :

#### 1. Traditional Position :

According to the traditional position expounded by Graham and Dodd the stock market places considerably more weight on dividends than on retained earnings. For them, the stock market is overwhelmingly in favour of liberal dividends as against niggardly dividends. Their view is expressed quantitatively in the following valuation model:

$P = m (D + E/3)$  Where,

P = Market price per share

D = Dividend per share

E = Earning per share

m = a multiplier

As per this model, in the valuation of shares the weight attached to dividends is equal to four times the weight attached to retained earnings. In the model prescribed, E is replaced by (D+R) so that

$$P = m \{D + (D+R)/3\}$$
$$= m (4D/3) + m (R/3)$$

#### 2. Walter Model :

Prof. James E Walter supports the view that the dividend policy has a bearing on the value of the shares and has presented a model to explain the relevance of dividend policy for the valuation of the firm. His model is based on the following assumptions:

- a) All the investment proposals are to be financed by the retained earnings only and no external finance is available to the firm.
- b) The business risk complexion of the firm remains the same even after the fresh investment decisions are taken. In other words, the rate of return on investment i.e. 'r' and the cost of capital of the firm 'Ke' are constant.
- c) The firm has an infinite life.

This model considers that the investment decision and dividend decision of a firm are inter-related. Whether firm should or should not pay dividend depends upon whether the firm has got suitable investment opportunities to invest the retained earnings or not.

In the nutshell, a firm can maximize the market value of its shares and the value of the firm by adopting a dividend policy as follows :

- If  $r > K_e$ , the payout ratio should be zero (i.e. 100% profits should be retained)
- If  $r < K_e$ , the payout should be 100% (i.e. 100% profits should be distributed)

- If  $r = K_e$ , the dividend is irrelevant and is not expected to affect the market price of the share and the value of the firm.

The relationship between dividend and share price on the basis of Walter's formula is shown below:

$$P = \frac{D}{K_e} + \frac{(r/K_e)(E - D)}{K_e}$$

Where,

P = Market price per equity share

D = Dividend per equity share paid by the firm

r = Rate of return on investments of the firm

E = Earnings per equity share of the firm

$K_e$  = Cost of equity share capital

### 3. Gordon's Model

Myron Gordon has also proposed a model suggesting that the dividend policy is relevant and can affect the value of the share as well as that of the firm! This model is also called "Gordon's constant growth model".

This model is based on the following assumptions :

- The firm is an all equity firm, and it has no debt.
- All the investment proposals are to be financed by the retained earnings only and no external finance is available to the firm.
- The business risk complexion of the firm remains the same even after the fresh investment decisions are taken. In other words, the rate of return on investment i.e. 'r' and the cost of capital of the firm ' $K_e$ ' are constant.
- The firm has an infinite life.
- The growth rate of the firm 'g' is the product of its retention ratio, b, and its rate of return, r, i.e.  $g = br$
- The cost of capital of the firm besides being constant is more than growth rate, g i.e.  $K_e > g/br$

The relationship between dividend and share price on the basis of Gordon's formula is shown as under:

$$P = \frac{D_1}{K_e - g}$$

Where,

P = Current market price of the share

$D_1$  = Expected dividend in year 1

$K_e$  = Cost of capital

$g/br$  = Growth rate of the firm

$E_1$  = Expected dividend in year 1

B = Retention ratio (1 - payout ratio)

The formula given by Gordon shows that when the rate of return is greater than the discount rate, the price per share increases as the dividend ratio decreases

and if the return is less than discount rate it is vice-versa. The price per share remains unchanged where the rate of return and discount rate are equal. In other words, if the firm adopts a zero payout then the investor may not be willing to offer any price. For a growth firm ( $r > K_e > g$ ), the market price decreases when payout ratio increases. For the firm having  $r < K_e$ , the market price increases when the payout ratio increases. If  $r = K_e$ , the dividend policy is irrelevant.

#### 4. Dividend Irrelevance : MM approach

The most comprehensive argument in support of the irrelevance of dividends is provided by MM hypothesis. Modigliani and Miller thesis relating to relationship between leverage cost of capital and value of the firm is akin to NOI approach. The NOI approach is definitional or conceptual and lacks behavioral significance. The NOI approach, in other words, does not provide operational justification for the irrelevance of capital structure. The MM preposition supports the NOI approach relating to irrelevance of cost of capital to degree of leverage.

**Assumptions** The MM hypothesis of irrelevance of dividends is based on the following critical assumptions:

1. Perfect capital markets in which all investors are rational. Information is available to all free of cost, there are no transactions costs; securities are infinitely divisible; no investor is large enough to influence the market price of securities; there are no flotation costs
2. There are no taxes. Alternatively, there are no differences in tax rates applicable to capital gains and dividends. In other words, tax rate for the business entity and the investor will be the same.
3. A firm has a given investment policy which does not change. The operational implications of this assumption is that financing of new investments out of retained earnings will not change the business risk complexion of the firm and, therefore, there would be no change in the required rate of return.
4. There is a perfect certainty by every investor as to future investments and profit. In other words, investors are able to forecast future prices and dividends with certainty. This assumption is dropped by MM later.

The crux of the MM position on the irrelevance of dividend is the arbitrage argument.

$$P_0 = \frac{1}{(1 + K_e)} (D_1 + P_1)$$

where  $P_0$  = Prevailing market price of a share

$k_e$  = Cost of equity capital

$D_1$  = Dividend to be received at the end of period 1

$P_1$  = Market price of a share at the end of period 1

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Thanks ....



## CHP - 12

# Cash Management



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### CONCEPTS COVERED

1. INTRODUCTION
2. MOTIVES FOR HOLDING CASH
3. CASH BUDGET
4. PREPARATION OF CASH BUDGET
5. PRACTICAL QUESTIONS
6. MANAGING CASH COLLECTIONS AND PAYMENTS
7. ACCELERATING COLLECTIONS
8. FLOAT
9. CONTROLLING PAYMENTS
10. OPTIMUM CASH BALANCE
11. CASH MANAGEMENT MODELS
12. RECENT DEVELOPMENTS IN CASH MANAGEMENT
13. MANAGEMENT OF MARKETABLE SECURITIES





## 1. INTRODUCTION :

Simply said “Cash is what CASH does”. Cash is the most important instrument for daily functioning of the enterprise. Cash is the most liquid asset. Cash is very rightly compared like a life blood to the enterprise. Efficient cash management is needed to ensure that cash is rightly put into use and no cash is lying idle, because cash, like any other product does not come free. On other hand if it is used efficiently, it increases the profitability of the firm. Every enterprise should ensure proper liquidity so that regular business is not affected.

## 2. MOTIVES FOR HOLDING CASH :

1. Transaction Motive. **“The need for cash for the current transaction”**  
Cash is needed by business for day to day transaction. Normally to try and match the regular inflow from operation with the payments needed for regular operations. However there may be times when regular inflow may be delayed or blocked for some reason. In such times we need cash for smooth functioning of regular transactions.
2. Precautionary Motive. **“The desire for the security from uncertain events”**  
We always believed in, and rightly so, that precaution is better than sure. Future is uncertain, it just happened to me today that while travelling my car broke down, and was struck in middle, and more embarrassing was to find that I was short of cash. Cash is needed to protect us from future uncertain events. Some wise man was quoted as saying that a man feels safe only with Old wife, Old Dog and Money at Bank. Though married people may argue on the first one.
3. Speculative Motive. **“The desire for making profit from available opportunity”**  
Cash may be needed to react to any opportunity available in future to invest and earn better profit. How many times it has happened with us that we liked something and then realized that we don't have cash to buy that. Better save now and wait for right opportunity to invest and earn rewards.

## 3. CASH BUDGET :

Cash budget is an important tool to control and plan cash receipts and payments. If we don't plan the receipts and payment, we might find ourselves short at most occasions. Its like managing our pocket-money. I don't know how it works now – but you may all agree and might have experienced that the day we receive pocket money , we are the king but very soon we will be out of it and then wait endlessly for the next month to start. Cash budget serves the following purpose

- a. It co-ordinates the timings of inflow and outflow.
- b. It helps us in identification of period when we may need excess cash.
- c. It helps us in identification of period when we shall be holding surplus cash.
- d. Identification of above period will help us to plan for such events. In case of shortage we should plan the source from where the funds can be made available and in case of excess funds we can plan to areas for investment so that the funds are utilized in efficient manner.
- e. It will also help the firm to decide on credit period and discount terms for the debtors.
- f. Finally we may also decide to avail the discount and other schemes extended by the creditors.

#### 4. PREPARATION OF CASH BUDGET :

Cash budget starts with the identification of the period for which the cash budget is required to be prepared. Cash budget can be prepared monthly, fortnightly, weekly, quarterly etc. Generally it is prepared monthly. Once the period is decided we shall start identifying inflows and outflows.

##### Estimation of Cash Inflows

1. Cash Sales
2. Receipt from Debtors
3. Interest / Dividend Received
4. Issue of Shares / Debentures
5. Sale of Asset

##### Estimation of Cash Outflow

1. Cash Purchase
2. Payment to Creditors
3. Payments of various expenses like rent, Salary, Administration exp, Selling Exp etc
4. Payment of Interest and Dividend
5. Redemption of Shares and Debentures
6. Payment of Taxes

##### Format of Cash Budget

Details	January (Rs.)	February (Rs.)	March (Rs.)
A. Opening Balance	Xxx	xxx	Xxx
B. Inflows			
1. Cash Sales	xxx	xxx	xxx
2. Receipt from Debtors	xxx	xxx	xxx
3. Interest / Dividend Received	xxx	xxx	xxx
4. Issue of Shares / Debentures	xxx	xxx	xxx
5. Sale of Asset	xxx	xxx	xxx
<b>Total (B)</b>	<b>Xxx</b>	<b>xxx</b>	<b>xxx</b>
<b>Total (A + B)</b>	<b>Xxx</b>	<b>xxx</b>	<b>xxx</b>
C. Outflows			
1. Cash Purchase	xxx	xxx	xxx
2. Payment to Creditors	xxx	xxx	xxx
3. Interest / Dividend Paid	xxx	xxx	xxx
4. Redemption of Shares / Debentures	xxx	xxx	xxx
5. Wages Paid	xxx	xxx	xxx
6. Salaries Paid	xxx	xxx	xxx
7. Rent Paid	xxx	xxx	xxx
8. Administration Expenses	xxx	xxx	xxx
9. Selling Expenses			
<b>Total (C)</b>	<b>Xxx</b>	<b>xxx</b>	<b>xxx</b>
D. Closing Balance (A + B – C)	Xxx	xxx	xxx

Add : Borrowing	Xxx	xxx	xxx
Less : Investments	Xxx	xxx	xxx
Adjusted Closing	Xxx	xxx	xxx

## 5. PRACTICAL QUESTIONS :



### Question 1 – Ramesh

Ramesh has given the sales forecast for January to July 2012 and actual sales for November, December 2011 were as under:

With other particulars given prepare cash flow statement for five months January-May 2012:

		Rs.
Sales	November 2011	80,000
	December 2011	70,000
	January 2012	80,000
	February	1,00,000
	March	80,000
	April	1,00,000
	May	90,000
	June	1,20,000
	July	1,00,000

Sales 20% cash 80% credit payable in the third month. (January sales in March). Variable expenses 5% on turnover time lag half month. Commission 5% on credit sales payable in the third month. Purchase 60% of the sales of the month. Payment 3rd month of purchase. Rent and other expenses Rs. 3,000 paid every month. Other payments : Fixed assets purchases March Rs. 50,000. Taxes April Rs. 20,000. Opening Cash Balance Rs. 25,000



### Question 2 – M/s Ram Ltd.

From the information given below, prepare a cash budget of M/s Ram Ltd. for the first half year of 2012, assuming that costs would remain unchanged:

- Sales are both on credit and for cash, the latter being one-third of the former;
- Realisation from debtors is 25% in the month of sale, 60% in the month following that and the balance in the month after that;
- The company adopts a uniform pricing policy of the selling price being 25% over cost;
- Budgeted sales of each month are purchased and paid for in the preceding month;
- The company has outstanding debentures of Rs.2 lakhs on 1st Jan. which carry interest at 15% per annum payable on the last date of each quarter on calendar year basis. 20% of the debentures are due for redemption on 30th June 2006.
- The company has to pay the last installment of advance tax, for assessment year 2012-2013, amounting to Rs.54,000.
- Anticipated office costs for the six month period are Jan. Rs.25,000, Feb. Rs.20,000, March Rs.40,000, April Rs.35,000, May Rs.30,000 and June Rs.45,000.

- (h) The opening cash balance of Rs. 10,000 is the minimum cash balance to be maintained deficits have to be met by borrowals in multiples of Rs. 10,000 on which interest, on monthly basis, has to be paid on the first date of the subsequent month, at 12% p.a. interest is payable for a minimum period of a month.
- (i) Rent payable is Rs.2,000 per month.
- (ii) Sales forecast for the different months are:
- |              |              |
|--------------|--------------|
| October 2011 | Rs. 1,60,000 |
| November     | Rs. 1,80,000 |
| December     | Rs. 2,00,000 |
| Jan. 2012    | Rs. 2,20,000 |
| February     | Rs. 1,40,000 |
| March        | Rs. 1,60,000 |
| April        | Rs. 1,50,000 |
| May          | Rs. 2,00,000 |
| June         | Rs. 1,80,000 |
| July         | Rs. 1,20,000 |



### Question 3

The following details are forecasted by a company for the purpose of effective utilisation and management of cash :

- (i) Estimate sales and manufacturing costs :

Year and month	Sale	Materials	Wages	Overheads
2010	Rs.	Rs.	Rs.	Rs.
April	4,20,000	2,00,000	1,60,000	45,000
May	4,50,000	2,10,000	1,60,000	40,000
June	5,00,000	2,60,000	1,65,000	38,000
July	4,90,000	2,82,000	1,65,000	37,500
August	5,40,000	2,80,000	1,65,000	60,800
September	6,10,000	3,10,000	1,70,000	52,000

- (ii) Credit terms :
- Sales – 20 percent sales are on cash, 50 percent of the credit sales are collected next month and the balance in the following month.
  - Credit allowed by suppliers is 2 months
  - Delay in payment of wages  $\frac{1}{2}$  (one-half) month and overheads is 1(one) month.
- (iii) Interest on 12 percent debentures of Rs.5,00,000 is to be paid half-yearly in June and December.
- (iv) Dividends on investments amounting to Rs.25,000 are expected to be received in June, 2010.
- (v) A new machinery will be installed in June, 2010 at a cost of Rs.4,00,000 which is payable in 20 monthly installments from July, 2010 onwards.
- (vi) Advance income-tax to be paid in August, 2010 is Rs.15,000.
- (vii) Cash balance on 1<sup>st</sup> June, 2010 is expected to be Rs.45,000 and the company wants to keep it at the end of every month around this figure, the excess cash (in multiple of thousand rupees) being put in fixed deposit.

You are required to prepare monthly cash budget on the basis of above information for four months beginning from June, 2010.



**Question : 4**

On the basis of details given below, you are required to prepare a cash budget of a company for the first six months of 2014 :

- (i) Prices and costs are expected to remain constant.
- (ii) Of the total sales, 80% are on credit and the balance for cash.
- (iii) 75% of the credit sales are collected in the month after sale and 24% in the month after that. Bad debt accounts for the balance.
- (iv) The company has forecast a gross profit of 25% on cost of sales.
- (v) Anticipated sales of each month are purchase and paid for the previous month by utilising the supplier's offer of a cash discount of 3%.
- (vi) Sales forecast are :

Rs.		Rs.	
October, 2013	1,20,000	January, 2014	1,00,000
November, 2013	1,40,000	February, 2014	80,000
December, 2013	1,60,000	March, 2014	1,00,000
		April, 2014	1,40,000
		May, 2014	1,80,000
		June, 2014	2,00,000
		July, 2014	1,80,000

- (vii) Anticipated salaries and expenses to be paid at the end of each month are :

Rs.		Rs.	
January, 2014	24,000	April, 2014	36,000
February, 2014	24,000	May, 2014	32,000
March, 2014	30,000	June, 2014	36,000

The expenses given in (vii) above do not include salesman commission of 3% on all credit sales, paid in the month after sales.

- (ix) Rent is paid at Rs. 7500 p.m.
- (x) Advance tax due in March 2014 is estimated at Rs.80,000.
- (xi) On 14% Debentures of the face value of Rs. 2,00,000, interest is payable half-yearly in May and November.
- (xii) Cash on hand on January 2014 is likely to be Rs. 1,20,000.

In case of deficit of cash at any time in the year, short term borrowals (in Rs. thousands) are planned on which interest is payable at 1.1/2% p.m. Interest payable is for a minimum period of a month.

All calculations are to form part of your answer.



**Question 5**

From the information and the assumption that the cash balance in hand on 1st January 2010 is Rs 72,500 prepare a cash budget.

Assume that 50 per cent of total sales are cash sales. Assets are to be acquired in the months of February and April. Therefore, provisions should be made for the payment of Rs 8,000 and Rs 25,000 for the same. An application has been made to the bank for

the grant of a loan of Rs 30,000 and it is hoped that the loan amount will be received in the month of May.

It is anticipated that a dividend of Rs 35,000 will be paid in June. Debtors are allowed one month's credit. Creditors for materials purchased and overheads grant one month's credit. Sales commission at 3 per cent on sales is paid to the salesman each month.

Month	Sales	Materials Purchases	Salaries & Wages	Production Overhead	Office and Selling Overhead
(Rs)	(Rs)	(Rs)	(Rs)	(Rs)	(Rs)
January	72,000	25,000	10,000	6,000	5,500
February	97,000	31,000	12,100	6,300	6,700
March	86,000	25,500	10,600	6,000	7,500
April	88,600	30,600	25,000	6,500	8,900
May	1,02,500	37,000	22,000	8,000	11,000
June	1,08,700	38,800	23,000	8,200	11,500



### Question 6 – Lucky Ltd.

The following particulars have been obtained in respect of retail business of Lucky Ltd. for the three months ending March, 2014 :

- (1) Working capital as on 1st Jan. 2014 has been estimated as follows :

	Rs.
Cash and Bank Balances	10,900
Debtors	51,400
Creditors	42,200
Outstanding expenses	4,000
<b>Dividend due</b>	<b>9,700</b>
Tax Due	6,400
Stock	26,000

- (2) Budgeted Profit statement at the end of each month : 2014

	January	February	March
	Rs.	Rs.	Rs.
Sales	42,000	36,000	34,000
Cost of sales	32,700	28,100	26,600
Gross Profit	9,300	7,900	7,400
Administrative Selling & Distribution Exp.	6,300	5,400	5,100
	3,000	2,500	2,300

- (3) Budgeted balances at the end of each month: 2014

	January	February	March
	Rs.	Rs.	Rs.
Stock	24,000	22,000	20,000
Debtors	52,000	50,000	47,000
Creditors	40,000	39,000	38,000
Outstanding Expenses	4,000	3,000	2,000
Dividend due	9,700	—	—
Tax due	6,400	6,400	---

**Note:** Depreciation amounting to Rs.1,500 has been included in the budgeted expenditure of each month. You are required to prepare a cash budget upto March 2014.



**Question 7**

A new manufacturing company is to be incorporated from January 1, 2012. Its authorized capital will be Rs. 2 Crore divided into 20 lakh equity shares of Rs. 10 each. It intends to raise capital by issuing equity shares of Rs. 1 Crore (fully paid) on 1 January. Besides, a loan of Rs. 13 lakh @ 12% per annum will be obtained from a financial institution on January and further borrowings will be made at the same rate of interest on the first day of the month in which borrowing is required. All borrowings will be repaid along with interest on the expiry of one year. The company will make payment for the following assets in January:

	Rs. (in lakh)
Plant and Machinery	20
Land and Building	40
Furniture	10
Motor Vehicles	10
Stock of raw Materials	10

The following further details are available:

(1) Projected Sales (January-June)

	Rs. (in lakh)		Rs. (in lakh)
January	30	April	40
February	35	May	40
March	35	June	45

- (2) Gross profit margin will be 25% on sales.
- (3) The company will make credit sales only and these will be collected in the second month following sales.
- (4) Creditors will be paid in the first month following credit purchases. There will be credit purchases only.
- (5) The company will keep minimum stock of raw materials of Rs. 10 lakh.
- (6) Depreciation will be charged @ 10% per annum on cost on all fixed assets.
- (7) Payment of preliminary expenses of Rs. 1 lakh will be made in January. ;
- (8) Wages and salaries will be Rs. 2 lakh each month and will be paid on the first day of the next month.
- (9) Administrative expenses of Rs. 1 lakh per month will be paid in the month of their incurrence.

Assume no minimum required cash balance.

You are required to prepare the monthly cash budget (January-June), the projected Income Statement for the 6 month period and the projected Balance Sheet as on 30<sup>th</sup> June, 2012.

**6. MANAGING CASH COLLECTIONS AND PAYMENTS :**

Now people, we know how to prepare cash budget. But remember that it was only the budget, means estimation. How many times have to made an schedule for studies and implemented it with full perfection. Scheduling is different and implementing is different. So guys what I mean is that once we are done with budgeting, we now need to ensure that cash



inflows and outflows actually happens the way it was estimated, there are no major significant deviations to the same. Again there would be nothing wrong if we can improve on the same, i.e

1. Accelerate cash collections as much as possible and
2. Decelerate or delay cash disbursements.

## 7. ACCELERATE CASH COLLECTIONS :

The company can conserve cash and also reduce its requirement of cash, if it can speed up its cash collections by reducing the time lag from the day customer pays the bill by cash or cheque and the money becomes available to the company for its use. The company can use decentralized collection system known as concentration banking and lock box system to speed up cash collection and reduce the float time. With recent innovation of online payments things can improve considerably in this regards.

### 1. Concentration Banking

In concentration Banking the company establishes number of strategic collection center in different regions and location instead of a centralized collection centre at head office. Mobile service providers like vodaphone, Airtel etc are extensively using this system to collect payments from the customers.

The cash collected by various center is deposited into the bank at local branches and surplus cash is concentrated to the head office.

### 2. Lock Box System

Under this system the company sets special post boxes which are known as lock boxes. Customers are directed to mail their payments to this boxes. Local Bank are authorized to collect the cheque's several times a day and deposits the cheque's in the company's account. The main advantage of the lock box system that the cheques are deposited sooner than the company might have done. However the system involves the cost. So the company examine the benefit and then take proper decision.

### 3. Electronic Payment Services (EPS)

Improve your cash flow and funds management electronically. EPS lets you collect funds on predetermined dates and eliminates paperwork.

### 4. Online payments

With the invent of online systems, it becomes relatively simple for the companies to collect cash from the clients and minimize the float to Zero Days.

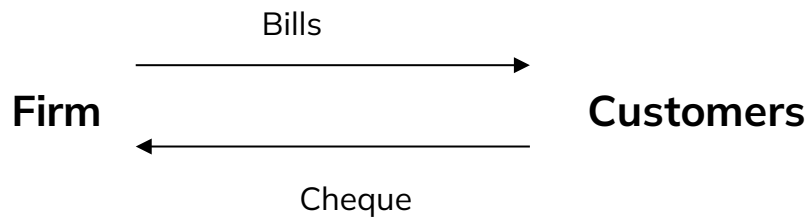
## 8. FLOAT :

The term float refers to the period which takes the cash to reach to the company from the customer. Cash moves through various stages of processing before it finally reaches the company. Float is the difference between cash balance appearing in the pass book and the firm's book. Four kinds of float with reference to cash management are

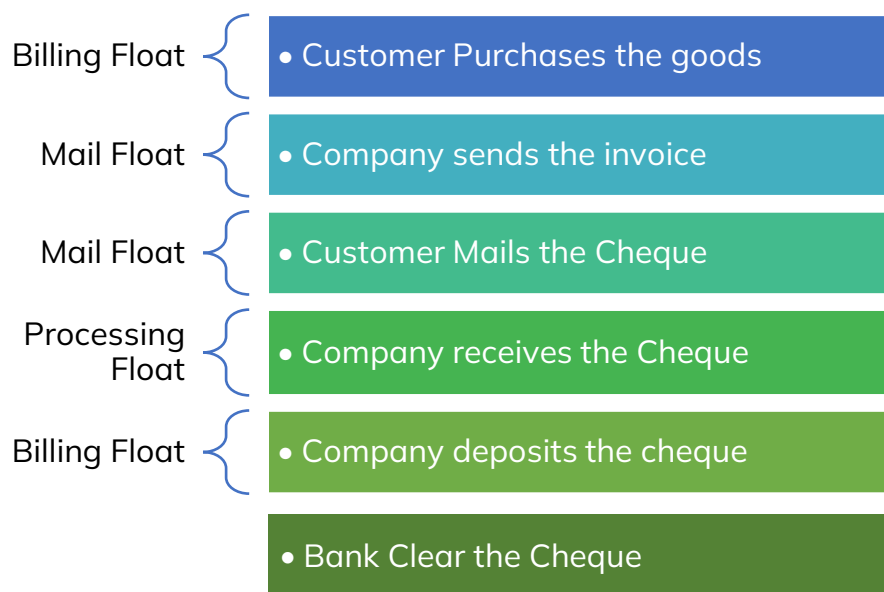
- **Billing Float :** Company needs to prepare a formal document, known as invoice, for the sale of goods and services requesting the customer to pay for the same. The time between the actual sale and the mailing of the invoice is known as billing float.



- **Mail Float** : Mail float is the time the firm's bill spends in the mail on its way to the customer and the time the customers cheque spend in the mail on its way to the firm.



- **Processing Float** : Processing Float is the time taken between the firms receipts of the payment and its deposit of the cheque for collection. The firm should have an effective system to atleast deposit the cheque in bank the very next day.
- **Clearing Float** : It's the time taken by the bank since accepting the cheque for collection till the funds are made available in the firms account.



## 9. CONTROLLING PAYMENTS :

Another way to effective cash management and reducing the requirement of holding cash, is controlling and delaying payment. Don't take the word delaying in literal sense, i don't mean to say that u should not pay ontime, but control the payments.

Following strategies should be used.

1. The payments should be made on the due date and not before that.
2. Use Cheques for the payments, so that u can utilize the processing and clearing float.
3. Forward the payments by mails to avail the benefit of mailing float.

The above Float chart will work in favour of the company if proper payment strategies are put into place.

## 10. OPTIMAL CASH BALANCE :

The firm should, as discussed earlier, maintain optimum cash balance to cater to the day – to – day operations. Now what is important for us to understand is that optimum does not mean maximum or minimum. In my words the term optimum means “Just enough – not more – not

less”. Excess cash is not good because it involves cost and shortage of cash hampers daily operations. There should be proper trade-offs between profitability and liquidity. Now this raises another question as to how should we reach or conclude what is optimum? How should we calculate the same ? Let me take u ahead

## 11. CASH MANAGEMENT MODELS :

Over the years several types of mathematical models have been developed which helps to determine the optimum cash balance to be maintained by a business organizations. The basic purpose of all the models is to ensure that cash does not remain idle unnecessarily and at the same time there is no shortage of cash for regular and smooth operations.

### 1. Baumol's Model

This model is very much like an inventory type model. According to this model, the optimum cash level is that level where the transaction cost and the carrying cost are the minimum.

- Carrying cost refers to the cost of holding the cash, i.e the interest foregone which could have been earned on marketable securities.
- Transaction cost refers to the cost of getting the marketable securities converted into cash. It is incurred incase of shortage of cash, when the marketable securities are required to be sold and converted into cash.

The optimum cash balance is the point where these two costs are minimum. This model assumes that usage of the cash is constant and known with certainty. The formula to calculate the same is

$$C = \sqrt{\frac{2U \times P}{S}}$$

C = Optimum Cash Balance

U = Annual (or Monthly) Cash Disbursement

P = Fixed Cost per transaction

S = Opportunity Cost of one rupee p.a (or p.m)

The model is based on the following assumptions

- 1) Cash needs of the firm are known with certainty.
- 2) Use of the cash is uniform over a period of time and even that too is known with certainty
- 3) The holding cost i.e. Cost of Holds cash is known and remains constant
- 4) In transaction cost it is also known and remains constant



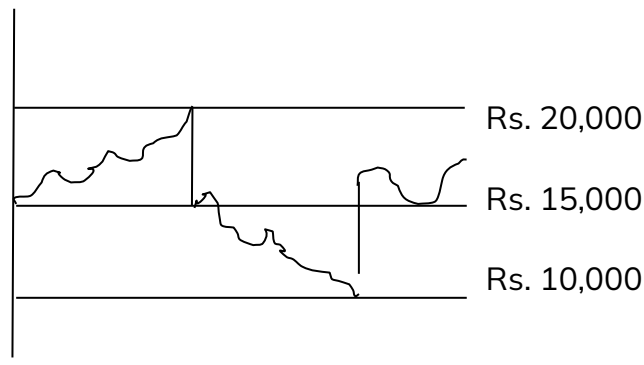
### Question 8

A firm maintains a separate account for cash disbursement. Total disbursement are Rs.1,50,000 per month or Rs.15,00,000 per year. Administrative and transaction cost of transferring cash to disbursement cost of transferring cash to disbursement account is Rs.25 per transfer. Marketable securities yield is 10% per annum.

Determine the optimum cash balance according to William J. Baumol Model.

## 2. Miller – Or Cash Management Model

This model suggest control limit on excess cash and minimum cash. The model limits are set on both side i.e. upper limit and lower limit. It is best illustrated be the following diagram.



Now as Diagram shows Rs.20000 is upper limit and Rs.10000 is lower limit & now the fun start with a balance of Rs.15000 and it is allowed to operate. If balance is between Rs.10000 to Rs.20000 and if it touches upper limit point i.e. is Rs.20000 to amount expected to Rs. 5000 i.e Rs.20000 – Rs.15000 is invented also if it touches the lower point Rs. 10000 then Rs. 5000 is invented back into business.

This model is more realistic since it allows certainty in cash balance within lower and upper limit.

## 12. RECENT DEVELOPMENT IN CASH MANAGEMENT :

Its Very important to keep a track on recent innovations in present cash management because it will help the firm to inverse liquidity without the increasing cost. The technological advancement has bought about the technology changes the way bank function is performed.

### Zero balance Account

Many Firms uses the strategy to optimize the earnings by cash management. This strategy calls for substitution of make table cash from cash available in account the firm securities from available cash. In Vase of shortage the securities are sold to realize cash the success of this strategy depends on availability of securities and liquidity and profitability attached to it.

### Banks innovation

Gone are the days or I would say rather say going when we use to go bank to deposit days before the amount with development of internet banks are becoming extremely modern it is approach and style of working. The updating of technology helped to provide quick service as all the branches are linked to each other the changes in banking system are

- Instant messages on withdrawals and deposits on mobile.
- Electronic funds transfer
- Banking on cash.

### Mobile Banking

Various banking are now updated themselves to this innovation. Customer can now check their balance transfer function invent excess available funds instantly. This revolution has lead to efficient cash management.

### Money Market Operations

Knowledge on money market operation and money market instruments will help the financial manager to in optimum utilization of fund .Deposits can be more for specific period ranging from a day to a year .Such instruments are more safe they also provide good liquidity.

### Electronic cash management system

Use of electronic cash management system ensures speed in cash management system. It can be of great help to multinational companies with multiple locations and markets spaced across can be linked for efficient cash management. Advantage of electronic cash management.

1. Centralized money control
2. Transfer of funds from location when it is exceed of places where than is shortage
3. Decrease in interest cost
4. Earning of interest on deposits
5. Ensure on idle cash at any location
6. Transfer of finish
7. Saving in transaction cost
8. Saving in opportunity cost
9. It reduces idle money float
10. Reduces cheque issues

### Imprest system of petty cash

For better control on cash management firm should implement imprest cash management system .such system ensures proper control on various aspect of cash management. Under this system as fixed amount is allocated for petty expenses for a period. The balance is replenished at the end of specific period.

### Virtual Backup

The practice of banking has undergone a significant change. I remember once going to bank as a kid and had to wait for an hour to get to right person. Now the banks have become customer and service oriented.

Banks today are connected through high end technology like internet. In fact introduction of ATM is have changed the way bank can perform. Does anyone remember waiting for teller to call our no for withdrawal of cash. Increasingly ATM'S are equipped to work like a branch in itself.

Introductions of NEFT ,RTGS and structured financial messaging system have changed the way of banking. The latest trend catching up is mobile banking with mobile's going leaps & bounds since 90's. Banking is trying to catch up that leap. Business houses and multinationals have caught up with virtual banking in a huge way.

## **13. MANAGEMENT OF MARKETABLE SECURITIES :**

One of the important aspects of cash management is management of marketable securities. In fact firm take the following 3 aspect, into consideration while deciding on security it want to interest.

- 1) **Safely** : in finish invested are for to purpose for maximize the earnings. it should than reverse i.e. risk of loss .firm should unsure minimum risk for such an investment .

- 2) **Maturity** : the investment should be made keeping future requirement into consideration .the maturity should be timed perfectly for maximum gain.
- 3) **Liquidity** : investment should be costly converted to cash. in security should be such that they can be sold without loss of any time.
- 4) **Word of advice** : in firm should restrict the choice to Govt treasury bills, commercial paper of corporate. Short term deposits with Banks & should avoid share of companies & other investments



### **Question 9 – Sai Trading Company**

The following information is available in respect of Sai Trading Company :

- 1) On an average, debtors are collected after 60 days: inventories have an average holding period of 90 days and creditors payment period on an average is 30 days.
- 2) The firm spends a total of Rs. 150 lakhs annually at a constant rate.
- 3) It can earn 12% on investment.

From The above Information, you are required to calculate

1. The cash cycle and cash turnover,
2. Minimum amounts of cash to be maintained to meet payment as they become due,
3. Saving by reducing the average inventory holding period by 30days

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Thanks ....



## CHP - 13

# Working Capital Management



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### CONCEPTS COVERED

1. INTRODUCTION
2. DEFINITIONS
3. NATURE AND CLASSIFICATION
4. FACTORS DETERMINING WORKING CAPITAL REQUIREMENTS
5. OPTIMUM WORKING CAPITAL
6. NEEDS FOR ADEQUATE WORKING CAPITAL
7. ESTIMATION OF WORKING CAPITAL
8. PRACTICAL QUESTIONS
9. WORKING CAPITAL BASED ON CASH COST
10. OPERATING CYCLE
11. WORKING CAPITAL POLICIES
12. PROBLEM FOR SELF PRACTICE



## 1. INTRODUCTION :

Management of Working capital refers to management of various components of current assets and current liabilities. Current Assets includes Stock, Debtors, Bills Receivables, Prepaid Expenses and Cash and Bank Balance. Current Liabilities includes creditors, Outstanding Expenses, Bank Overdraft among others.

Management of Working Capital is important for two reasons. Firstly, the existence of working capital is imperative in all firms. Secondly proper management of working capital can maximize the profitability of firm.

Any firm needs long term finance to finance fixed assets. The firm also needs short term finance to finance its working capital. The firm can maximize proper use of finance if they can properly manage working capital of the firm. Excess working capital implies existence of idle funds, and on the other hand shortage of working capital funds can affect smooth running of the business. Therefore it is very essential that financial manager gives proper attention to management of working.

Management of working capital includes the management of the level of individual current assets and current liabilities and management of working capital as a whole. In next few chapters we shall discuss every aspect of individual components of current assets and liabilities. Here in this chapter we shall restrict to management of working capital as a whole.

## 2. DEFINITION :

Working capital in layman's language can be described as funds required for day to day running of the business. It is excess of Current Assets over current liabilities.

## 3. NATURE AND TYPES OF WORKING CAPITAL :

Working Capital can be classified on the basis

1. Value
2. Time

### 1. Value

From value the point of view, working capital can be classified as Gross Working Capital, Net Working Capital

**Gross Working Capital :** Gross working capital refers to firm's total investment in current assets taken together. In short total of current assets of the firm refers to gross working capital.

For eg the firm has

Stock of Raw Material	Rs 5,000
Stock of Work in progress	Rs. 10,000
Stock of Finished Goods	Rs. 20,000
Debtors	Rs. 20,000
Prepaid Selling Expenses	Rs. 1,000
Cash / Bank Balance	<u>Rs. 10,000</u>
the total Current Assets are	<u>Rs. 66,000</u>

**Net Working Capital :** Net working Capital means the excess of current Assets over Current Liabilities. Net working Capital = Current Assets – Current Liabilities. Current liabilities allow the firms to use the funds for the period the liabilities can be delayed.

A positive working capital is a good sign for the firm. It is measure of firms liquidity. The greater the margin the better for the firm. It indicates that firm is in the position to pay all its short term obligations.

Net working Capital can further be classified into

- i. Positive working Capital = Current Assets > Current Liabilities
- ii. Zero Working Capital = Current Assets = Current Liabilities
- iii. Negative Working capital = Current Assets < Current Liabilities

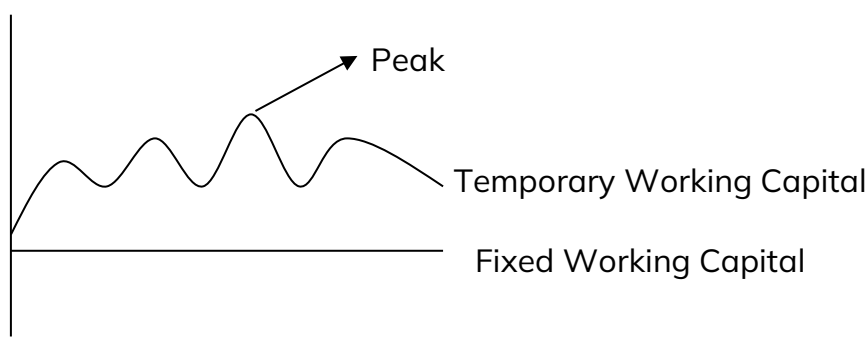
## 2. Time

Working capital can be classified into Permanent working capital and temporary working capital from time point of view.

**Permanent working capital :** It is also referred as core working capital. It's the minimum thing. It's the least amount of Stock, debtors and cash that's needed to be maintained for business operations at any time during the accounting period. It is kind of fixed working capital. Any shortage in this can seriously damage firms liquidity.

**Temporary Working Capital :** It's the working Capital needed over and above the permanent working Capital. The need for temporary working capital fluctuates from time to time according to business activities. The need for working capital may increase during peak season and may reduce considerably during off season. Its directly co-related to production, higher the production, higher the working capital needed and vice versa.

**For eg :** Sugar industries require higher amount of working capital during the peak season and lower amount of working capital once the season is over.



In terms of variability the working capital can further be classified into

- i. **Seasonal Working capital :** This is the amount of working capital needed to meet the seasonal demands.  
**For example :** Trader in crackers needs more working capital in Diwali period and less working in the remaining period
- ii. **Special Working Capital :** Such working Capital is needed to meet unforeseen circumstances, like strikes, fire, war, riots etc.



- iii. **Peak Working Capital** : It's the variable working capital needed during the peak period. It's the maximum working capital needed by the firm during its course of operations.

#### 4. NATURE AND TYPES OF WORKING CAPITAL :

The working capital needs of the firm are determined and influenced by various factors. The factors affecting the working capital requirement may not only vary from industry to industry and firm to firm but also may vary for same firm from time to time. One should keep a close watch on such factors as they change from time to time and therefore it is necessary that the need for working capital is assessed on regular basis and is not taken as one time process. Factors affecting the working capital requirements are

1. **Nature of Business** : Estimation of working capital requirement is closely related to the nature of business of the firm. In case of retail shop selling articles on cash basis, requirement of working capital is fairly small in amount, on the opposite large retail counters, requiring huge stock, needs fairly higher amount of working capital.
2. **Technology and production process** : Innovation and technological advancement have fairly reduced the requirement of working capital. The production process which is labor oriented needs high amount of working capital. However if the production process are capital oriented, the need for working capital requirement reduces.
3. **Business cycle period** : Business cycle, i.e., start up, growth, boom, stable, recession, fall etc. all this periods needs different amount of working capital. During periods of boom and expansion, the amount of working capital requirement increases considerably.
4. **Seasonal fluctuations** : There are firms which deals in products and services where demand fluctuates according to seasons. Demand for product like cold drinks often sees a spike during summer seasons, which will increase the need for working capital.
5. **Inventory** : Working capital requirement largely depends on the amount of inventory required to be held ready for production process. Quantum of inventory is influenced by the nature of business. For e.g. electricity manufacturing company needs huge amount of coal inventory as the supply is affected by season like rains. The techniques of Just in time (JIT) and Economic Order quantity (ECQ) can be handful for the same.
6. **Cash** : It is most liquid component of working capital. But cash holding involves cost. The firm should maintain the cash balance which is optimum for the smooth running of the business, and also reduces holding cost.
7. **Debtors** : The credit period allowed to the debtors, affects the amount of working capital directly. Higher the credit period, greater the working capital. Firms are always in a fix with reference to credit period management, because increase in credit period increases the sales, but on the other side, increases the risk of bad debts and also quantum of working capital.
8. **Market competition** : Market competitiveness also affect the working capital requirements. Greater competitiveness induces the firms to extent liberal credit terms, discount terms and other freebies, which increases the working capital requirement of the firms. On the other hand, the industries which includes few firms and are not as competitiveness will have stable working capital needs.
9. **Operational Efficiency** : Firms can reduce the amount of working capital requirements by greater operational efficiency. Cost control is what all firms are targeting. For e.g.

promoting paperless environment can reduce wastages of stationery, and thereby reduce the needs of working capital funds.

10. **Credit period from Suppliers** : The credit period from supplier, reduces the working capital funds, as inventory can be purchased on credit.

## 5. OPTIMUM WORKING CAPITAL :

I have often found people misreading this word "Optimum". What does this word mean? People tend to read it as maximum. Guys optimum neither means maximum nor does it mean minimum. It means adequate. Working capital as defined is the excess of current assets over current liability. If current assets are not sufficient to cover current liability, the firm may run into problems.

The adequacy of working capital is best calculated by current ratio and Quick ratio. We have already studied that the standard ratio is 2:1 and Quick Ratio is 1:1. Following this ratio may ensure smooth running of business. Let us continue this discussion in the next head.

## 6. NEEDS FOR ADEQUATE WORKING CAPITAL :

One cannot underestimate the need for adequate working capital for the smooth functioning of the business. Adequate working capital is needed for smooth running of business; any shortage in the same can adversely affect the business. On the other hand excess working capital also affect the bottom-line (Profitability) of the firm. Prime objective of the financial manager of the firm is to increase shareholders wealth. This can be done by keeping adequate working capital needs. Now adequate refer to the quantum that is not in excess and not short also.

The excess investment in working capital higher than required results in

- a) Large stock of inventory, which may result into damages, waste, out of fashion, etc.
- b) Higher investment in debtors, which may lead to greater risk due to bad debts, and also loss of opportunity cost.
- c) Lower amount is invested in Fixed Assets, which leads to reduction of profitability.
- d) Indicates conservative attitude of the management.

On the other hand inadequate working capital situations leads to

- a) Lack of liquidity for smooth running of the business.
- b) Underutilization of Assets
- c) Frequent breakdown of assets, leading to delay in deliver schedules and affecting the flow of the orders.
- e) The Growth rate of the firm may be stagnant.
- f) The goodwill of the firm may be adversely affected, as there may frequent delays in payment to creditors.

The management of working capital is the responsibility of the entire management and financial manager in particular. He should ensure that the firm maintains optimum working capital. Efforts should be made to build an efficient internal control system for management of working capital.

## 7. ESTIMATION OF WORKING CAPITAL :

### Statement of Estimation of Working Capital

Particulars	W.N	Amount(Rs.)	Amount(Rs.)
Current Assets			
Stock-in-trade			
Raw material	1	XX	
Work-in-Progress	2	XX	
Finished goods	3	XX	XX
Debtors / Bills Receivable	4		XX
Prepaid Expenses	5		XX
Cash / Bank Balance			XX
CA			XX
<b>Less : Current Liabilities</b>			
Creditors / Bills – Payable	6	XX	
Outstanding Expenses	7	XX	
Bank Overdraft	8	XX	XX
Net Current Assets			XX
<b>Add : Safety Margin / Contingency</b>			XX
Working Capital Estimation			XX

### Working Note :

W.N	Current Assets / Current Liabilities	Formula	Amount
1.	Raw Material	$\frac{\text{Raw Material P.A}}{12/ 52/ 365} \times \text{No. of Months Stock}$	XX
2.	Work – in – Progress (A+B+C)	$\frac{\text{Raw Material P.A}}{12/ 52/ 365} \times \text{Process Period}$	XX
	Raw Material		XX
	Labour / Wages	$\frac{\text{Labour P.A}}{12/ 52/ 365} \times \text{Process Period } \frac{1}{2}$	XX
	Overheads	$\frac{\text{Overhead P.A}}{12/ 52/ 365} \times \text{Process Period } \frac{1}{2}$	XX
	Note : In the absence of information it shall be assumed that raw material is fed into pipeline in full and labor and overhead are completed to 50%		
3.	Finished Goods	$\frac{\text{Cost of Goods P.A}}{12/ 52/ 365} \times \text{No. of Months Stock}$	XX
4.	Debtors / Bills Receivable	$\frac{\text{Sales P.A}}{12/ 52/ 365} \times \text{Period of Credit}$	XX
	Note : Debtors can alternatively be calculated at cost. However in the absence of information it should always be calculated at sales.		
5.	Prepaid Expenses	$\frac{\text{Expenses P.A}}{12/ 52/ 365} \times \text{No. of months Prepaid}$	XX

6.	Advance to supplier	$\frac{\text{Raw Material P.A}}{12/ 52/ 365} \times \text{Months Advance}$	XX
7.	Creditors	$\frac{\text{Raw Material P.A}}{12/ 52/ 365} \times \text{No. of months Credit}$	XX
8.	Outstanding Expenses	$\frac{\text{Expenses P.A}}{12/ 52/ 365} \times \text{No. of month outstanding}$	XX

## 8. PRACTICAL QUESTIONS :



### Question 1

You are required to prepare a statement showing the estimate of working capital required to finance the level of activity of Rs 20000 units per year from the following information, obtained from the Books of RM LTD.

Particulars	Per Unit Rs
Raw Material	12
Direct Labor	3
Overheads	9
Total Cost	24
Profit	6
Selling Price	30

1. Raw Material are in stock on an average for two months
2. Material are in process on average for half a month .
3. Finished Goods are in Stock on Average for two month
4. Credit allowed by creditors is 2 months
5. Credit allowed to debtors is 3 months
6. Lag in payment of wages is half month
7. Cash on hand and a bank is expected to be Rs.7000.



### Question 2

The Following Information has been extracted from the records of Company

Product Cost Sheet	Rs per Unit
Raw Material	45
Direct Labor	20
Overheads	40
Total	105
Profits	15
Selling Price	120

1. Raw material are in stock on an average of two months.
2. The material are in process of an average for 4 weeks. The degree of completion is 50%.
3. Finished Goods stock on average is for the one month.
4. Time lag in payment of wages and overheads is 1 ½ week.
5. Time lag allowed to debtors is 2 months.
6. Credit allowed by supplier is one month
7. 20% of the output is sold against cash.
8. The company expects to keep a cash balance of Rs1,00,000.

9. Take 52 weeks per annum.
10. The Company is poised for manufacture of 1,44,000 units in the year. You are required to prepare a statement showing working capital requirements of the company.



### Question 3 – M/s Harry Enterprise

M/s Harry Enterprise manufactures and sells good to the retailers. The following figures are budgeted for the year 2009.

	Amount	Amount
Sales		8,32,000
<b>Less:</b> Raw Material	4,57,600	
Labour	1,66,400	
Overhead	83,200	7,07,200
Profit		1,24,800

- (a) Raw materials are carried in stock for 8 weeks
- (b) Process period 2 weeks
- (c) Finished good are carried in stock for 4 weeks
- (d) Customers gets 12 weeks and suppliers get 8 weeks
- (e) The lag in payment of wages and overhead is 4 weeks
- (f) The activity is spread over evenly during the year
- (g) Safety margin should be 10%



### Question 4

A Proforma cost sheet of a Company provides the following data:

	Rs.
Raw Material cost per unit	117
Direct Labour cost per unit	49
Factory overheads cost per unit (includes depreciation of Rs.18 per unit at budgeted level of activity)	<u>98</u>
Total cost per unit	264
Profit	<u>36</u>
Selling price per unit	<u>300</u>

Following additional information is available:

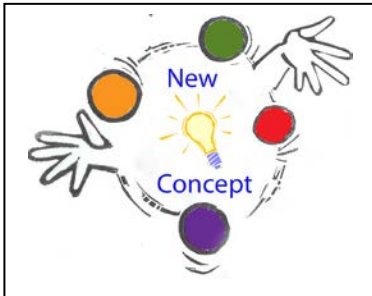
Average raw material in stock	:	4 weeks
Average work-in -process stock	:	2 weeks
(% completion with respect to		
Materials	: 80%	
Labour and Overheads	: 60%	
Finished goods in stock	:	3 weeks
Credit period allowed to debtors	:	6 weeks
Credit period availed from suppliers	:	8 weeks
Time lag in payment of wages	:	1 week
Time lag in payment of overheads	:	2 weeks

The company sells one-fifth of the output against cash and maintains cash balance of Rs 2,50,000.

**Required:**

Prepare a statement showing estimate of working capital needed to finance a budgeted activity level of 78,000 units of production. you may assume that production is carried on evenly throughout the year and wages and overheads accrue similarly.

**9. WORKING CAPITAL BASED ON CASH COST :**



As discussed above working capital is difference between current assets and current liabilities.

Here we should note that debtor are calculated at sales, however in real practice the amount invested to create debtors is its cost not the selling price.

For e.g. a product is manufactured at cost of Rs.25/- each and sold at Rs.30/- and 10,000 units are sold ∴ Debtor = 10,000 x 30 = 3,00,000

However of cost of production is = 10,000 x 25 = 2,50,000

So actually funds blocked as 2,50,000 and not 3,00,000 (Rs.50,000 is the profit element)

Also there are various other non cash costs included in the total cost of the product. Most common among such expense is depreciation.

Following above example if the total cost of Rs.1,50,000 includes depreciation of Rs.20,000, then the actual cash outflow is Rs.1,30,000. In other words funds blocked for debtors is Rs.1,30,000 and hence debtor should be calculated at 1,30,000.

Also such cost should be excluded in calculation of various components of cash cost.

Note : We should follow cash cost concept for debtor of question ask for the same, however non cash cost should always be exclude from the calculation of working capital.



**Question 5 – Q Ltd.**

Q Ltd. sells goods at a uniform rate of gross profit of 20% on sales including depreciation as part of cost of production. Its annual figures are as under :-

	Rs.
Sales (At 2 months credit)	24,00,000
Materials consumed (suppliers credit 2 months )	6,00,000
Wages paid ( monthly at the beginning of the subsequent month )	4,80,000
Manufacturing expenses ( Cash expenses are paid - one month in arrear )	6,00,000
Administration expenses ( Cash expenses are paid - one month in arrear )	1,50,000
Sales promotion expenses (paid quarterly in advance	75,000

The company keeps one month sock which of raw material and finished goods. A minimum cash balance of Rs.80,000 is always kept. The company wants to adopt a 10% safety margin in the maintenance of working capital.

The company has no work in progress

Find out the requirement of working capital of the company on cash cost basis.



**Question 6 – MNO Ltd.**

MNO Ltd. has furnished the following cost data relating to the year ending of 31<sup>st</sup> March, 2008

	Rs (in Lakhs)
Sales	450
Material consumed	150
Direct wages	30
Factory overheads (100% variable)	60
Office and Administrative overheads (100% variable)	60
Selling overheads	50

The company wants to make a forecast of working capital needed for the next year and anticipates that:

- Sales will go up by 100%,
- Selling expenses will be Rs 150 lakhs.
- Stock holdings for the next year will be-Raw material for two and half months, Work-in-progress for one month, Finished goods for half month and Book debts for one and half months,
- Lags in payment will be of 3 months for creditors, 1 month for wages and half month for Factory, Office and Administrative and Selling overheads.

You are required to prepare statement showing working capital requirements for next year.



**Question 7 – Excel Markers Product**

Excel Markers Product furnishes you with the following information for the year 2013.

Sales	(at 3 month's Credit)	1,20,000
Raw materials	(at 2 Month credit)	60,000
Wages	(at lag ½ month)	15,000
Manufacturing expenses	(Time lag one month)	12,000

Company always keeps one month's stock of raw materials & finished goods, Production cycle takes month time and it is even throughout the year. Company expect that.

- (1) Due to budget, prices of raw materials will go up by 10%
- (2) Due to agreement with labour union, company will have to pay overall 5% increase to workers.
- (3) To cover increase in cost of production, to increase the selling price by 20 %
- (4) However after increase also prices will be lower as compared to competition therefore sales will go up by 25%.

You are required to prepare estimate of working capital requirement for 2014.





**Question 8 – MN Ltd**

MN Ltd is commencing a new project for manufacture of electric toys. The following cost information has been ascertained for annual production of 60,000 units at full capacity:

	Amount per unit	
Raw materials	20	
Direct labour	15	
Manufacturing overheads:		
Variable	15	
Fixed	<u>10</u>	25
Selling and Distribution overheads:		
Variable	3	
Fixed	<u>1</u>	<u>4</u>
Total cost		64
Profit		<u>16</u>
Selling price		<u>80</u>

In the first year of operations expected production and sales are 40,000 units and 35,000 units respectively. To assess the need of working capital, the following additional information is available:

- (i) Stock of Raw materials.....3 months consumption.
- (ii) Credit allowable for debtors.....1<sup>1/2</sup> months.
- (iii) Credit allowable by creditors.....4 months.
- (iv) Lag in payment of wages .....1 month.
- (v) Lag in payment of overheads.....1/2 month.
- (vi) Cash in hand and Bank is expected to be Rs 60,000.
- (vii) Provision for contingencies is 10 % required of working capital requirement including that provision.

You are required to prepare a projected statement of working capital requirement for the first year of operation. Debtors are taken at cost.



**Question 9 – T-Trax computers Limited**

From the following details provided by T-Trax computers Limited, estimate their working capital requirement for the year as at 31st March, 2014.

**Balances as at on 1st April, 2013**

	Rs.	Rs.
Debtors	67,000	
Creditors	56,250	
Cash	15,000	
Stock	30,000	
Sales for the year (with uniform profit of 30% on sales)		2,66,750
Purchase for the year		1,56,750
Payment to Creditors during the year		1,65,000



Receipts from debtors during the year		2,62,500
Estimated Overheads on annual basis (one fifth to remain outstanding)		20,000
Estimated amounts to be kept for special Millennium dividend in addition to Cash Balance		5,000
No amount for contingency is to be kept.		

### 10. OPERATING CYCLE / WORKING CAPITAL CYCLE :

Operating cycle means the time by the company to recover the cash it spent for the purchase of material, stock going through production process, finished goods holding period, converted to sales and getting the cash back from debtors.

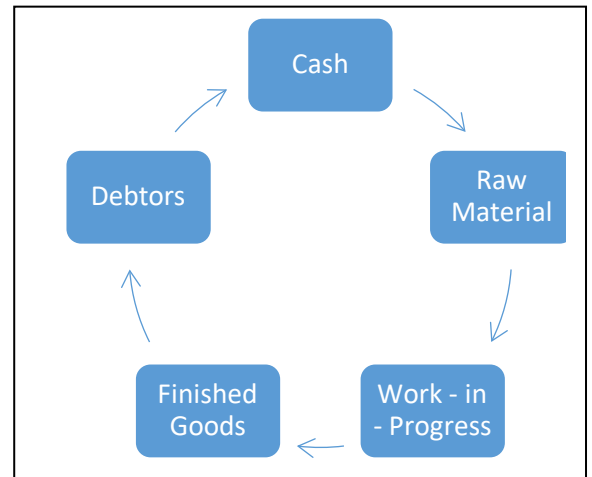
Operating cycle is a useful tool to manage working capital. It can be calculated by adding the number of days of holding raw material, period of process, finished goods holding period and period of debtors.

Operating cycle can be partly and I say partly financed by creditors, however not totally, the shortfall will still need to be financed.

$$\text{Operating cycle} = R + W + F + D - C$$

Where,

- R = Raw Material holding period
- W = Work in progress period
- F = Finished Goods holding period
- D = Debtors period
- C = Creditors period



$$\text{Raw Material Period} = \frac{\text{Average Raw material stock}}{\text{Total Raw material consumption}} \times 365$$

$$\text{Work - In - Period Process} = \frac{\text{Average Work - in - progress}}{\text{Total Cost of production}} \times 365$$

$$\text{Finished Goods Period} = \frac{\text{Average Finished Goods}}{\text{Total Cost of goods sold}} \times 365$$

$$\text{Debtors Period} = \frac{\text{Average Receivable}}{\text{Total Credit Sales}} \times 365$$

$$\text{Creditors Period} = \frac{\text{Average Creditors}}{\text{Total Credit purchase}} \times 365$$



#### Question 10 – XYZ Ltd.

From the following information of XYZ Ltd., you are required to calculate :

- (a) Net operating cycle period,
- (b) Number of operating cycles in a year.

	<b>Rs.</b>
(i) Raw material inventory consumed during the year	6,00,000

(ii)	Average stock of raw material	50,000
(iii)	Work-in-progress inventory	5,00,000
(iv)	Average work-in-progress inventory	30,000
(v)	Finished goods inventory	8,00,000
(vi)	Average finished goods stock held	40,000
(vii)	Average collection period from debtors	45 days
(viii)	Average credit period availed	30 days
(ix)	No. of days in a year	360 days



**Question 11 – Clear Ltd.**

Compute for a new company Clear Ltd. the duration of the operations working capital cycle from the following figures of year 2014 assuming 360 days per year comprising age of raw materials, finished goods debtors, and creditors only.

	Rs.
Closing Stock of:	
Raw Materials	40,000
Work-in-progress	28,000
Finished Goods	42,000
Raw Material Consumed	1,92,000
Cost of Goods Sold	2,80,000
Sales	3,20,000
Closing Debtors	64,000
Closing Creditors	32,000



**Question 12 – CS Limited**

Following information is forecasted by the CS Limited for the year ending 31<sup>st</sup>March, 2010:

	Balance as at 1 <sup>st</sup> April, 2009	Balance as at 31 <sup>st</sup> March, 2010
Raw Material	45,000	65,356
Work-in-progress	35,000	51,300
Finished goods	60,181	70,175
Debtors	1,12,123	1,35,000
Creditors	50,079	70,469
Annual purchases of raw material(all credit)		4,00,000
Annual cost of production		7,50,000
Annual cost of goods sold		9,15,000
Annual operating cost		9,50,000
Annual sales (all credit)		11,00,000

You may take one year as equal to 365 days.

You are required to calculate:

1. Net operating cycle period.
2. Number of operating cycles in the year.
3. Amount of working capital requirement.

## 11. WORKING CAPITAL POLICIES :

Firm needs to invest in Fixed Assets and Current Assets to support particular level of production. The finance manager may follow any of the three working capital policies depending upon the risk appetite. Selecting a policy involves risk – return trade off

All firms will needs to invest same amount of money Fixed Assets to maintain the production levels. They can however change investment in current assets depending on the following policies.

### 1. Conservative Policy :

As the name suggest, this policy entails huge investment in current assets. Such firms have high current Assets, high current assets to fixed assets ratio, great on liquidity, however short on profitability. In a nut shell – profitability is sacrificed in favor of liquidity.

### 2. Aggressive policy :

This policy is totally opposite to conservative policy, low investment in current assets, lower current assets to fixed assets ratio, lower working capital but higher profitability. Such firms are low on liquidity but high on profitability.

### 3. Moderate Policy :

This policy calls for trade off between conservative policy and aggressive policy. Little liquidity that comes with conservative policy is sacrificed to gain a little profitability of aggressive policy. Thus this policy lies in between the conservative policy and aggressive policy.



### Question 13

An engineering company is considering its working capital investment for the year 2003-04.

The estimated fixed assets and current liabilities for the next year are Rs.6.63 corer and Rs.5.967 corer respectively. The sales and earnings before interest and taxes (EBIT) depend on investment in its current assets - Particularly inventory and receivables. The company is examining the following alternative working capital policies.

Working Capital policy	Investment in Current Asset (Rs Crore)	Estimated Sales (Rs Crore)	EBIT (Rs Crore)
Conservative	11.475	31.365	3.1365
Moderate	9.945	29.325	2.9325
Aggressive	6.63	25.50	2.55

You are required to calculate the following for each policy:

- Rate of return on total assets.
- Net working capital position.
- Current assets to fixed assets ratio.
- Discuss the risk-return trade off of each working capital policy.

**RISK V/S RETURN :**

**1. Conservative Policy :**

As the name suggest, this policy entails huge investment in current assets. Such firms have high current Assets, high current assets to fixed assets ratio (1.73), great on liquidity(5.508), however short on profitability(17.32%). In a nut shell – profitability is sacrificed in favor of liquidity.

**2. Aggressive policy :**

This policy is totally opposite to conservative policy, low investment in current assets, lower current assets to fixed assets ratio (1), lower working capital (0.663) but higher profitability(19.23%). Such firms are low on liquidity but high on profitability.

**3. Moderate Policy :**

This policy calls for trade off between conservative policy and aggressive policy. Little liquidity that comes with conservative policy is sacrificed to gain a little profitability of aggressive policy. Thus this policy lies in between the conservative policy and aggressive policy.

**12. PROBLEM FOR SELF PRACTICE :**



**Question 1 – RM Ltd.**

You are required to prepare a statement showing the estimate of working capital required to finance the level of activity of Rs 60000 units per year from the following information, obtained from the Books of RM LTD.

Particulars	Per Unit Rs
Raw Material	15
Direct Labor	4
Overheads	6
Total Cost	25
Profit	5
Selling Price	30

- Raw Material are in stock on an average for two months.
- Material are in process on average for a month.
- Finished Goods are in Stock on Average for three month.
- Credit allowed by creditors is 2 months.
- Credit allowed to debtors is 2 months, 20% of goods are sold for cash.
- Lag in payment of wages is half month.
- Cash on hand and a bank is expected to be Rs7000.



**Question 2 – Pooja Company**

The Following Information has been extracted from the records of Pooja Company

Product Cost Sheet	Rs per Unit
Raw Material	90
Direct Labor	30
Overheads	30
Total	150
Profits	25
Selling Price	175

- Raw material are in stock on an average of 2 months.

2. The material are in process of an average for 1 weeks. The degree of completion is 80% in all respect.
  3. Finished Goods stock on average is for the 2 month.
  4. Time lag in payment of wages and overheads is 1 month.
  5. Time lag allowed to debtors is 2 months.
  6. Credit allowed by supplier is one month
  7. 30% of the output is sold against cash.
  8. The company expects to keep a cash balance of Rs1,50,000.
  9. The Company is poised for manufacture of 300,000 units in the year.
- You are required to prepare a statement showing working capital requirements of the company.



**Question 3 – Pankaj company**

A cost sheet of a Pankaj company provides the following :

	Amount per Unit (Rs)
Raw Material	100
Direct Labor cost	37.50
Overheads cost	75
Total	212.50
Profits	37.50
Selling Price	250

The Company keeps raw material in stock on and average for 8 weeks work-in-progress, on an average for 2 week; and finished good in stocks, on an average for 4 weeks.

The credit allowed by suppliers is three weeks and company allows four weeks credit to its debtors. The lag in payment of wages is one week and lag in payment of overhead expenses is 3 weeks.

The Company sells two-fifth of the output against cash and maintains cash-in-hand and at bank put together at Rs 37,500.

**Required:**

Prepare a statement showing estimate of Working Capital needed to finance an activity level of 1,70,000 units of production. Assume that production is carried on evenly throughout the year, and wages and overheads accrue similarly.



**Question 4 – M/s Holmer Enterprise**

M/s Holmer Enterprise manufactures and sells good to the retailers. The following figures are budgeted for the year 2009.

	Amount	Amount
Sales		16,64,000
<b>Less: Raw Material</b>	8,64,000	
Labour	4,00,000	
Overhead	2,50,000	15,14,000
Profit		1,50,000

- (a) Raw materials are carried in stock for 2 months
- (b) Process period ½ a month

- (c) Finished good are carried in stock for 1 month
- (d) Customers gets 4 months and suppliers get 2 months
- (e) The lag in payment of wages and overhead is 1 month
- (f) The activity is spread over evenly during the year
- (g) Safety margin should be 15%



**Question 5**

A Proforma cost sheet of a Company provides the following data:

	Rs.
Raw Material cost per unit	110
Direct Labour cost per unit	50
Factory overheads cost per unit (includes depreciation of Rs.10 per unit at budgeted level of activity)	<u>90</u> 250
Total cost per unit	<u>50</u>
Profit	<u>300</u>
Selling price per unit	

Following additional information is available:

Average raw material in stock	:	4 weeks
Average work-in -process stock (% completion with respect to Materials	:	2 weeks
Labour and Overheads	: 60%	
Finished goods in stock	:	3 weeks
Credit period allowed to debtors	:	8 weeks
Credit period availed from suppliers	:	6 weeks
Time lag in payment of wages	:	1 week
Time lag in payment of overheads	:	2 weeks

The company sells one-fifth of the output against cash and maintains cash balance of Rs 1,50,000.

**Required:**

Prepare a statement showing estimate of working capital needed to finance a budgeted activity level of 87,000 units of production. you may assume that production is carried on evenly throughout the year and wages and overheads accrue similarly.



**Question 6 – RM Ltd.**

RM Ltd. sells goods at a uniform rate of gross profit of 20% on sales including depreciation as part of cost of production. Its annual figures are as under :-

	Rs.
Sales (At 2 months credit)	8,00,000
Materials consumed (suppliers credit 2 months )	2,00,000
Wages paid ( monthly at the beginning of the subsequent month )	1,60,000
Manufacturing expenses ( Cash expenses are paid - one month in arrear )	2,00,000
Administration expenses ( Cash expenses are paid - one month in arrear )	50,000

Sales promotion expenses (paid quarterly in advance	25,000
---	--------

The company keeps 3 month stock of raw material and finished goods. A minimum cash balance of Rs.50,000 is always kept. The company wants to adopt a 10% safety margin (inclusive of such Balance) in the maintenance of working capital. The company has no work in progress  
Find out the requirement of working capital of the company on cash cost basis.



**Question 7 – HP Limited**

The following annual figures relate to HP Limited :

Sales (at three month credit)	Rs.30,00,000
Materials consumed (suppliers extend 2 month's credit)	Rs.7,50,000
Wages paid (one month in arrear)	Rs.6,00,000
Manufacturing expenses outstanding at the end of the year (cash expenses are paid one month in arrear)	Rs.50,000
Total Administrative expenses for the year (cash expenses are paid 2 month in arrear)	Rs.2,00,000
Sales Promotion expenses for the year (paid quarterly in advance)	Rs.4,00,000

The company sells its products on gross-profit of 25% assuming depreciation as a part of cost of production. it keeps two month's stock of finished goods and one month's stock of raw materials as inventory. it keeps cash balance of Rs 2,50,000. Assume a 5% safety margin, work out the working capital requirements of the company on cash cost basis. Ignore work-in-progress.



**Question 8 – CM Ltd.**

CM Ltd. has furnished the following cost data relating to the year ending of 31<sup>st</sup> March, 2013

	Rs (in Lakhs)
Sales	900
Material consumed	300
Direct wages	60
Factory overheads (100% variable)	120
Office and Administrative overheads (100% Fixed)	120
Selling overheads	100

The company wants to make a forecast of working capital needed for the next year and anticipates that:

- Sales will go up by 100%,
- Selling expenses will be Rs 150 lakhs.
- Stock holdings for the next year will be-Raw material for two and half months, Work-in-progress for one month, Finished goods for half month and Book debts for one and half months,
- Lags in payment will be of 3 months for creditors, 1 month for wages and half month for Factory, Office and Administrative and Selling overheads.

You are required to prepare statement showing working capital requirements for next year.



**Question 9 – Clear Ltd.**

Compute for a new company Clear Ltd. the duration of the operations working capital cycle from the following figures of year 2014 assuming 360 days per year comprising age of raw materials, finished goods debtors, and creditors only.

	Rs.
Closing Stock of:	
Raw Materials	80,000
Work-in-progress	56,000
Finished Goods	84,000
Raw Material Consumed	1,92,000
Cost of Goods Sold	2,80,000
Sales	3,20,000
Closing Debtors	64,000
Closing Creditors	32,000



**Question 10**

An engineering company is considering its working capital investment for the year 2003-04.

The estimated fixed assets and current liabilities for the next year are Rs.6.63 corer and Rs.5.967 corer respectively. The sales and earnings before interest and taxes (EBIT) depend on investment in its current assets - Particularly inventory and receivables. The company is examining the following alternative working capital policies.

Working Capital policy	Investment in Current Asset (Rs Crore)	Estimated Sales (Rs Crore)	EBIT (Rs Crore)
Conservative	11	31	3
Moderate	9	29	2
Aggressive	6	25	2

You are required to calculate the following for each policy:

- (i) Rate of return on total assets.
- (ii) Net working capital position.
- (iii) Current assets to fixed assets ratio.
- (iv) Discuss the risk-return trade off of each working capital policy.

Thanks ....





## CHP - 14

# Management of Receivables



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### CONCEPTS COVERED

1. INTRODUCTION
2. ASPECTS OF DEBTORS MANAGEMENT
3. FACTORS DETERMINING CREDIT POLICY
4. PRACTICAL QUESTIONS



## 1. INTRODUCTION :

This is another chapter on management of working capital. Debtor is an component of current assets. In this chapter we are going to discuss on various issues in connection with receivable. The intention behind studying this chapter to understand how can we optimize return on investment.

## 2. ASPECTS OF DEBTORS MANAGEMENT :

When goods are sold to customers on credit, it creates debtors. Selling goods on credit can increase sales, but it also blocks huge funds, increase of bad debts and also it increase the collection cost. Now we may think, why take such risk and incur such cost. However if we stop credit, the sales may decline. Let us discuss these issues through theory and some practical question.

### 1. Credit Period Management :

This is a well known fact, that increasing the credit period will increase the sales. However with the increase in credit period, the opportunity cost of blocked funds increases (Funds blocked could have been invested elsewhere). It also increase the risk of bad debts, cost of credit administration and cost of credit collection.

### 2. Credit Evaluation for new customers

When company sells goods to new customers and such customers demand credit, we need to do analysis of credit history for such customer. It should not happen that we allow credit to such customer and then it leads to loss to the company. Various aspects needs to be analyzed for such customer – there past credit history, risk of bad debts, etc.

### 3. Discount Terms

The company may decide to extend cash discount to its customers, to avoid opportunity cost of blocked funds and reduce the risk of bad debts. However cash discount also involves cost. The company needs to take prudent call on extension discount.

### 4. Loan on Receivable

Many banks today have started accepting receivables as an acceptable asset for extending credit. Here it becomes important for the company also maintain good quality of debtors. The bank will evaluate the receivables to extend credit to the company.

### 5. Credit Evaluation

The firm will also look into credit period extended to various clients and have periodic check on the effectiveness of its credit policy. Delays in payments by debtors can have great impact on the finance of the company.

## 3. FACTORS DETERMINING CREDIT POLICY :

The credit policy is an important factor affecting the finance of the firms. Firms needs to keep in mind the following points for determining the credit policy of the firm.

1. The nature of the product
2. The credit terms of the competitors
3. The discount terms
4. The credit history of the customers
5. The cost of Funds in the market
6. The cost of credit administration
7. The impact of credit on sales. etc

#### 4. PRACTICAL QUESTIONS :



##### Question 1 (Credit Period Management)

Radiance Garments Ltd. manufacturers readymade garments and sells them on credit basis through a network of dealers. Its present sale is Rs. 60 lakh per annum with 20 days credit period. The company is contemplating an increase in the credit period with a view to increasing sales. Present variable costs are 70% of sales and the total fixed costs Rs 8 lakh per annum. The company expects pre-tax return on investment @ 25%. Some other details are given as under:

Proposed Credit Policy	Average Collection Period (Days)	Expected Annual Sales
I	30	65
II	40	70
III	50	74
IV	60	75

Required: Which credit policy should the company adopt? Present your answer in a tabular form. Assume 360- days a year. Calculations should be made upto two digits after decimal.



##### Question 2 (Credit Period Management)

JKL Ltd. is considering the revision of its credit policy with a view to increasing its sales and profit. Currently all its sales are on credit and the customers are given one month's time to settle the dues. It has a contribution of 40% on sales and it can raise additional funds at a cost of 20% per annum. The marketing manager of the company has given the following options along with estimates for considerations:

Particulars	Current position	I Option	II Option	III Option
Sales (Rs in lakhs)	200	210	220	250
Credit period (in months)	1	1 1/2	2	3
Bad debts (% of sales)	2	2 1/2	3	5
Cost of Credit administration (Rs in lakhs)	1.20	1.30	1.50	3.00

You are required to advise the company for the best option.



##### Question 3 (Credit Period Management)

A company currently has an annual turnover of Rs 50 lakhs and an average collection period of 30 days. The company wants to experiment with a more liberal credit Policy on the ground that increase in collection period will generate additional sales. From the following information, kindly indicate which policy the company should adopt:

Credit Policy	Average Collection period	Annual Sales (Rs. Lakhs)
A	45 Days	56
B	60 Days	60
C	75 Days	62
D	90 Days	63

Costs: Variable cost : 80% of sales

Fixed cost : Rs 6 lakhs per annum

Required (Pre-tax) return on investment : 20%

A year may be taken to comprise of 360 days.



#### Question 4 (Credit Period Management)

XYZ Corporation is considering relaxing its present credit policy and in the process of evaluating two proposed policies. Currently the firm has annual credit sale of Rs.50 lakhs and accounts receivable turnover ratio of 4 times a year, the current level of loss due to bad debts is Rs. 1,50,000. The firm is required to give a return of 25% on the investment in new accounts receivable. The company's variable costs are 70% of the selling price. Given the following information which is better option ?

	Present policy	Policy Option I	Policy Option II
Annual Credit Sales	Rs.50,00,000	Rs. 60,00,000	Rs. 67,50,000
Account Receivable Turnover ratio	4 times	3 times	2.4 times
Bad debts losses	Rs.1,50,000	Rs. 3,00,000	Rs. 4,50,000



#### Question 5 (Credit Period Management)

RST Limited is considering relaxing its present credit policy and is in the process of evaluating two proposed polices. Currently, the firm has annual credit sales of Rs 225 lakhs and accounts receivable turnover ratio of 5 times a year. The current level of loss due to bad debts is Rs 7,50,000. The firm is required to give a return of 20% on the investment in new accounts receivables. The company's variable costs are 60% of the selling price. Given the following information, which is a better option?

	Present Policy	Policy option I	Policy Option II
Annual credit sales(Rs)	225	275	350
Account receivable turnover ratio	5	4	3
Bad debt losses (Rs)	7.5	22.5	47.5



#### Question 6 (Credit Period Management – With tax Adjustment)

A firm has a current sales of Rs 2,56,48,750. The firm has unutilized capacity. In order to boost its sales, it is considering the relaxation in its credit policy. The proposed terms of credit will be 60 days credit against the present policy of 45 days. As a result, the bad debts will increase from 1.5% to 2% sales. The firm's sales expected to increase by 10%. The variable operating costs are 72% of the sales. The Firm's Corporate tax

rate is 35%, and it requires an after-tax return of 15% on its investment. Should the firm change its credit period?



**Question 7 (Credit period Management – with Concepts of Fixed Cost and Variable Cost)**

A company has prepared the following projections for a year:

Sales	21,000 units
Selling price per unit	Rs. 40
Variable Costs per unit	Rs. 25
Total Costs per unit	Rs. 35
Credit period allowed	one month

The Company proposes to increase the credit period allowed to its customers from one month to two months. It is envisaged that the change in the policy as above will increase the sales by 8%.The company desires a return of 25% on its investment. You are required to examine and advise whether the proposed Credit policy should be implemented or not.



**Question 8 (Credit period Management – with Concepts of Fixed Cost and Variable Cost)**

The Marketing Manager of XY Ltd. is giving a proposal to the Board of Directors of the company that an increase in credit period allowed to customers from the present one month to two months will bring a 25% increase in sales volume in the next year. The following operational data of the company for the current year are taken from the records of the company:

	Rs
Selling price	21 p.u.
Variable cost	14 p.u.
Total cost	18 p.u.
Sales value	18,90,000

The Board, by forwarding the above proposal and data, requests you to give your expert opinion on the adoption of the new credit policy in next year subject to a condition that the company's required rate on investments is 40%.



**Question 9 (Credit Period Management – Working Capital Component and different credit terms)**

Nutromode Limited specialises in the manufacture of a computer component. The component is currently sold for Rs. 2,000 and its variable-cost is Rs. 1600. For the year ended 31.12.2014 the company sold on an average 400 components per month.

At present the company grants one month credit to its customers. The company is thinking of extending the same to two months on account of which the following is expected.

Increases in Sale	25%
Increases in Stock	Rs. 2,50,000
Increases in Creditors	Rs. 1,00,000

You are required to :

To advise the company on whether or not to extend the credit terms if:

- (a) All customers avail the extended credit period of two months and

- (b) Existing customers do not avail the credit terms but only the new customers avail the same. Assume in this case the entire increase in sales is attributable to the new customers.

The company expects a minimum return of 40% on the investment.



**Question 10 (Credit period evaluation)**

A Company has sales of Rs. 25,00,000. Average collection period is 50 days, bad debt losses are 5% of sales and collection expenses are Rs. 25,000. The cost of funds is 15%. The Company has two alternative Collection Programmes:

	<b>Programme I</b>	<b>Programme II</b>
Average Collection Period reduced to	40 days	30 days
Bed debt losses reduced to	4% of sales	3% of sales
Collection Expenses	Rs 50,000	Rs 80,000

Evaluate which Programme is viable.



**Question 11 (Credit Evaluation of New Customer)**

A new customer with 10% risk of non-payment desires to establish business connections with you. He would require 1.5 month of credit and is likely to increase your sales by Rs. 1,20,000 p.a. Cost of sales amounted to 85% of sales. The tax rate is 30%. Should you accept the offer if the required rate of return is 40% (after tax)?



**Question 12 (Credit Evaluation of New Customer)**

Slow payers are regular customer of Goods Dealers Ltd. Calcutta and have approached the seller for extension of a credit facility for enabling them to purchase goods from Goods Dealers Ltd. On an analysis of past performances and on the basis of information supplied to the following pattern of payment schedule emerges in regard to Show payers:

<b>Payment Schedule</b>	<b>Pattern</b>
At the end of 30 days	15% of the bill
- do - 60 days	34% of the bill
- do - 90 days	30% of the bill
- do - 100 days	20% of the bill
Non Recovery	1% of the bill

Slow payers want to enter into a firm commitment for purchases of goods of Rs. 15 lakhs in 2014 deliveries to be made in equal quantities on the first day of each quarter in the calendar year. The price per unit of commodity is Rs. 150 on which a profit of Rs. 10 per unit is expected to be made. It is anticipated by Goods Dealers Ltd. that taking up of this contract would mean an extra recurring expenditure of Rs. 5,000 per annum. If the opportunity cost of funds in the hands of Goods Dealers is 24% per annum. Would you as the finance manager of the seller recommend the grant of credit to slow payers? Working should form part of your answer.



**Question 13 (Credit Evaluation of new customers – and risk of Bad Debts)**

A group of new customers with 10% risk of non-payment desire to establish business connections with you. This group would require one and half month of credit and is likely to increase your sales by Rs. 60,000 p.a. production administrative and selling expenses amount to 80% of sales. You are required to pay income tax 50% should you

accept the offer if the required rate of return is 40% (after tax). Also state the degree of risk of non-payment that you would be willing assume if the required rate of return (after tax) were (i) 30% (ii) 20%.



**Question 14 (Decision on Cash Discount)**

A firm is considering offering 30-day credit to its customers. The firm likes to charge them an annualized rate of 24%. The firm wants to structure the credit in terms of a cash discount for immediate payment. How much would the discount rate have to be?



**Question 15 (Decision on Extending Discount terms)**

The present credit terms of P Company are 1/10 net 30. Its annual sales are Rs.80 lakhs, its average collection period is 20 days. Its variable costs and average total costs to sales are 85% and 95% respectively and its cost of capital is 10 per cent. The proportion of sales on which customers currently take discount is 0.5. P Company is considering relaxing its discount terms to 2/10 net 30. Such relaxation is expected to increase sales by Rs.5 lakhs, reduce the average collection period to 14 days and increase the proportion of discount sales to 0.8. What will be the effect of relaxing the discount policy on company's profit? Take year as 365 days.



**Question 16 (Bank Credit/ Loan on Debtors)**

A bank is analyzing the receivables of Jackson Company in order to identify acceptable collateral for a short-term loan. The company's credit policy is 2/10 net 30. The bank lends 80 percent on account where customers are not currently overdue and where the average payment period does not exceed 10 days past the net period. A schedule of Jackson's receivables has been prepared. How much will the bank lend on pledge of receivables, if the bank uses a 10 per cent allowance for cash discount and returns?

Account	Amount (RS)	Days Outstanding in days	Average Payment Period historically
74	25,000	15	20
91	9,000	45	60
107	11,500	22	24
108	2,300	9	10
114	18,000	50	45
116	29,000	16	10
123	<u>14,000</u>	27	48
	<b>1,08,800</b>		



**Question 17 (Credit Evaluation)**

The credit manager of XYZ Ltd. is reappraising the company's credit policy. The company sells the products on terms of net 30. Cost of goods sold is 85% of sales and fixed costs are further 5% of sales. XYZ classifies its customers on a scale of 1 to 4. During the past five years, the experience was as under:

Classification	Default as a percentage of sales	Average collection period-in days for non-defaulting accounts
1	0	45
2	2	42
3	10	40



4	20	80
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The average of interest is 15%. What conclusions do you draw about the company's Credit Policy? What other factors should be taken into account before changing the present policy? Discuss.



**Question 18 (Factoring)**

Star Limited is manufacturer of various electronic gadgets. The annual turnover for the year 2007 was Rs. 730 lakhs. The company has a wide network of sales outlets all over the country. The turnover is spread evenly for each of the 50 weeks of the working year. All sales are for credit and sales within the week are also spread evenly over each of the five working days.

All invoicing of credit sales is carried out at the Head Office in Bombay. Sales documentation is sent by post daily from each location to the Head Office. For the past two years delay in preparing and dispatching invoices were noticed. As a result only some of the invoices were dispatched in the same week and the remainder the following week.

An analysis of the delay in invoicing (being the interval between the date of sale and the date of dispatch of the invoice) indicated the following pattern:

No. of days of delay in invoices	3	4	5	6
% of weeks sales	20	10	40	30

A further analysis indicated that the debtors take on an average 36 days of credit before paying. This period is measured from the day of dispatch of the invoice rather than the date of sale.

It is proposed to hire an agency for undertaking the invoicing work at various locations. The agency has assured that the maximum delay would be reduced to three days under the following pattern:

No. of days of delay in invoicing	0	1	3
% of weeks sales	40	40	20

The agency has also offered additionally to monitor the collections which will reduce the credit period to 30 days.

Star Limited expects to save Rs.4,000 per month in postage costs. All working funds are borrowed from a local bank at simple interest rate of 20% p.a.

The agency has quoted a fee of Rs.2,00,000 p.a. for the invoicing work and Rs.2,50,000 p.a. for monitoring collections and is willing to offer a discount of Rs.50,000 provided both the works are given. You are required to advise Star Limited about the acceptance of agency's proposal. Working should form part of the answer.



**Question 19 (Factoring)**

A company is considering using a factor, the following information is relevant:

- a) The current average collection period for the company's debts is 80days and 1.5% of debtors default. The factor has agreed to pay over money due, after 60 days, and it will suffer the loss of any bad-debts.
- b) The annual charge for the factoring is 2% of turnover payable annually in arrears. Administration cost saving will total Rs. 1,00,000 p.a.
- c) Annual sales, all on credit, are Rs. 1,00,00,000. Variable costs total 80% of sales price. The company's cost of borrowings is 15% p.a. Assume year consisting of 365 days.



Should the company enter into a factoring agreement?



**Question 20 (Factor V/s Bank)**

The turnover of R Ltd. Rs. 60 lakhs of which 80% is on credit. Debtors are allowed one month to clear off the dues. A factor is willing to advance 90% of the bills raised on credit for a fee of 2% a month plus a commission of 4% on the total amount of debts. R Ltd. as a result of this arrangement is likely to save Rs. 21,600 annually in management costs and avoid bad debts at 1% on the credit sales.

A scheduled bank has come forward to make an advance equal to 90% of the debts at an interest rate of 18% p.a. However its processing fee will be at 2% on the debts. Would you accept factoring or the offer from the bank?



**Question 21 (Factoring Offer)**

The credit sales and receivables of M/s M Ltd. at the end of the year are estimated at Rs 3, 74, 00,000 and Rs 46, 00,000 respectively.

The average variable overdraft interest rate is 5%. M Ltd. is considering a proposal for factoring its debts on a non-recourse basis at an annual fee of 3% on credit sales. As a result. M Ltd. will save Rs 1,00,000 per year in administrative cost and Rs 3,50,000 as bad debts. The factor will maintain a receivables collection period of 30 days and advance 80% of the face value thereof at an annual interest rate of 7%. Evaluate the viability of the proposal.

**Note:** 365 days are to be taken in a year for the purpose of calculation of receivable



**Question 22 (Factoring Offer)**

The credit sales and receivables of M/s DEF Ltd. at the end of the year are estimated at Rs 561 Lakhs and Rs 69 Lakhs respectively.

The average variable overdraft interest rate is 5%.

DEF Ltd. is considering a proposal for factoring its debts on a non-recourse basis at an annual fee of 1.25% on credit sales.

As a result. DEF Ltd. will save Rs 1.5 Lakhs per year in administrative cost and Rs 5.25 Lakhs as bad debts.

The factor will maintain a receivables collection period of 30 days and advance 80% of the face ,value thereof at an annual interest rate of 7%. Evaluate the viability of the proposal.

**Note:** 365 days are to be taken in a year for the purpose of calculation of receivable



**Question 23 (Effective Cost of Factoring)**

A Ltd. has a total sales of Rs 3.2 crores and its average collection period is 90 days. The past experience indicates that bad-debt losses are 1.5% on Sales. The expenditure incurred by the firm in administering its receivable collection efforts are Rs 5,00,000. A factor is prepared to buy the firm's receivables by charging 2% Commission. The factor will pay advance on receivables to the firm at an interest rate of 18% p.a. after withholding 10% as reserve.

Calculate the effective cost of factoring to the Firm.



**Question 24 (Effective Cost of Factoring)**

RM Ltd. has total sales of Rs 4.50 crores and its average collection period is 120 days. The past experience indicates that bad debt losses are 2 percent on sales. The expenditure incurred by the company in administering its receivable collection efforts are Rs 6,00,000. A Factor is prepared to buy the company's receivables by charging 2 percent commission. The factor will pay advance on receivables to the company at an interest rate of 18 percent per annum after withholding 10 percent as reserve. You are required to calculate effective cost of factoring to the company

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Thanks ....





## ABOUT THE AUTHOR

**Rahul Malkan is a proficient faculty of Financial Reporting and Strategic Financial Management at CA Final level. He is an MBA in business financial. He has 20 years of experience in teaching industry and has authored 20 books in academics.**

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